



Do market information processes improve new venture performance?

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ABSTRACT

Does market information improve new venture performance? While some researchers argue that entrepreneurs do not need formal processes to collect and use market information, others suggest that the use of formal market information processes is positively related to firm performance. In this paper, we hypothesize that new venture performance is an increasing function of (1) the firm's level of customer interaction and (2) the use of formal processes for collecting and utilizing market information. We also hypothesize that these linkages will be stronger among new ventures serving emerging markets (i.e., markets in which customer needs and segments are evolving). We test these hypotheses using data collected from 224 new ventures located in the United States. Our findings indicate that, regardless of market condition, formal processes for the collection of market information are positively associated with the use of formal processes for market information utilization and this relationship is stronger among firms serving established markets. In addition, new venture performance is positively associated with the use of formal processes for utilizing market information and this relationship is also stronger in established markets. We also find that, in emerging markets, new venture performance is a positive function of the use of formal processes for collecting market information. Contrary to expectations, we find that, regardless of market condition, the level of customer interaction has a negative relationship with the use of formal processes for market information utilization and no significant relationship with performance.

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1. Executive summary

Entrepreneurship is a key driver of economic development and wealth creation, but the failure rate among new ventures is high. One possible explanation for these failure rates arises from differences across ventures in their collection and use of market information. The marketing literature has long emphasized the strategic importance of market information regarding customers and competitors. However, recent studies in the entrepreneurship literature argue that the collection of market information may not be related to new venture performance and that market information collection processes are not the primary focus of entrepreneurs.

In this study we explore the impact on new venture performance of two dimensions of a firm's market information processes. We hypothesize that new venture performance is an increasing function of (1) the use of processes designed to create continual interaction with customers and (2) the use of formal procedures for collecting and utilizing market information. We also hypothesize that these linkages will be stronger among new ventures serving emerging markets (i.e., markets in which customer needs and segments are evolving).

Our research is unique in several ways. First, unlike prior research on market information processes in small and medium-size firms, we focus explicitly on new ventures. As a result, our analysis yields important insights into the role within entrepreneurial start-ups of processes for collecting and using market information. Second, existing studies of market information processes have

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not distinguished between formal and informal market information processes. Our research is designed to address the explicit impact of formal processes. Third, recent research indicates that frequent interaction with customers has a positive impact on new product performance, which in turn should impact new venture performance. In this paper we integrate this research stream with the market information process literature by empirically assessing whether customer interaction and the formal use of market information processes are distinct constructs that influence new venture success. Fourth, several authors have hypothesized that increases in market uncertainty increase the need for market information. In this paper we extend this reasoning by arguing that both customer interaction and formal market information processes have greater value for firms entering a market in which customer preferences are not well established but are still emerging.

To test the theoretical model, we analyzed data from 224 new ventures. Our findings indicate that, regardless of market condition, formal processes for the collection of market information are positively associated with the use of formal processes for market information utilization and this relationship is stronger among firms serving established markets. In addition, new venture performance is positively associated with the use of formal processes for utilizing market information and this relationship is also stronger in established markets. We also find that, in emerging markets, new venture performance is a positive function of the use of formal processes for collecting market information. Contrary to expectations, we find that, regardless of market condition, the level of customer interaction has a negative relationship with the use of formal processes for market information utilization and no significant relationship with performance.

Our research has several important implications for entrepreneurs. Regardless of whether new ventures serve established or emerging markets, our findings indicate that new ventures can enhance their performance by adopting formal processes that identify potential sources of market information (e.g., customer visits, trade shows, publications, etc.) and specify the frequency with which information should be collected. In addition, new ventures can benefit from formal processes that encourage entrepreneurs to broaden the array of decision options considered, expand the kinds of information used to evaluate those options, and develop a fuller understanding of the various implications arising from this information. To ensure that the firm's formal processes do not impede effective decision-making, the implicit judgments and prioritizations contained in these processes should be made explicit and the firm should have a process for revising these judgments based on new information.

2. Introduction

Entrepreneurship is a key driver of economic development (Christensen and Bower, 1996), but the failure rate among new ventures is high (Shepherd et al., 2000). One recent empirical study of U.S. new technology ventures found that, after four years, only 36% of companies survived. After five years, the survival rate fell to 21.9% (Song et al., 2008). One possible explanation for these failure rates arises from differences across ventures in their collection and use of market information (Gruber, 2007).

A variety of empirical studies have found that both new product success and firm performance are increasing functions of the degree to which firms collect and utilize market knowledge (e.g., Han et al., 1998; Li and Calantone, 1998; Jaworski and Kohli, 1993; Matsuno et al., 2002). While most studies of market information processes have focused on established firms, several recent studies suggest that, among start-up ventures, the collection of market information may not be tightly linked with performance. Sarasvathy (2001) argued that formal market information collection processes are not the primary focus of entrepreneurs, because entrepreneurial opportunities are not found but created through iterative interactions with potential stakeholders. Shane and Delmar (2004) found that new ventures completing business plans before collecting market information (e.g., talking to customers) had a relatively lower termination hazard rate. More recently, Parker (2006) concluded that, when making decisions, entrepreneurs do not emphasize available market knowledge.

In this study we explore the impact on new venture performance of two dimensions of a firm's market information processes. In particular, we distinguish between formal processes for collecting and using market information. On one hand, information cannot be used unless it is first collected, and formal processes for information collection can help ensure that collection efforts are both comprehensive and timely. On the other hand, the process of collecting information does not in and of itself ensure that the collected information will be used. Because collected information is often discounted or ignored by decision makers, formal processes for information utilization can increase the number of decision options considered, expand the set of information used to evaluate those options, and encourage managers to develop a more comprehensive understanding of the implications of that information.

Our research is unique in several ways. First, unlike prior research on market information processes in small and medium-size firms (e.g., Mohan-Neill, 1995; Keh et al., 2007), we focus explicitly on new ventures. As a result, our analysis yields important insights into the role within entrepreneurial start-ups of processes for collecting and using market information.

Second, existing studies of market information processes have not distinguished between formal and informal market information processes. For example, Moorman's (1995) market information measurement scales ask respondents whether their divisions have "formal or informal processes" for collecting various kinds of market information, transmitting it internally, and then processing and acting on it. However, Moorman called for future research that explicitly addressed the performance impact of formal processes for market information acquisition and use, and our research is designed to address this issue.

Third, recent research indicates that frequent interaction with customers has a positive impact on new product performance (Li and Calantone, 1998; Joshi and Sharma, 2004; De Luca and Atuahene-Gima, 2007), which in turn should impact new venture performance. In this paper we integrate this research stream with the market information process literature by empirically assessing whether customer interaction and the formal use of market information processes are distinct constructs that influence new venture success.

Fourth, several authors (e.g., Kohli and Jaworski, 1990; Jaworski and Kohli, 1993; Kirca et al., 2005) have hypothesized that increases in market uncertainty increase the need for market information. In this paper we extend this reasoning by arguing that both customer interaction and formal market information processes have greater value for firms entering a market in which customer preferences are not well established but are still emerging.

Our analysis is based on data collected from 224 U.S. new ventures, each founded within seven years of our data collection. Our findings indicate that, regardless of whether a market is established or emerging, (1) formal processes for the collection of market information are positively associated with the use of formal processes for market information utilization and (2) formal processes for market information utilization are positively associated with firm performance. Moreover, both of these relationships are stronger in established markets than in emerging markets. We also find that, in emerging markets, the use of formal processes for collecting market information is positively associated with firm performance. Contrary to expectations, we find that, in both established and emerging markets, the level of customer interaction has a negative relationship with the use of formal processes for market information utilization and no significant impact on performance.

The remainder of our discussion is organized as follows. After briefly reviewing the relevant literature, we present our theoretical model and research hypotheses. We then describe our data collection procedures and present the results of our data analysis. We close with a discussion of implications, limitations, and suggestions for future research.

3. Does market information improve new venture performance?

In their study of market orientation, Kohli and Jaworski (1990) identified three key market information processes: the generation of market information, the dissemination of that information throughout the firm, and the organization-wide responsiveness of the firm to that information. Moorman (1995) extended the Kohli–Jaworski framework by distinguishing between the conceptual and instrumental use of market information. In her empirical work, she found that both forms of information utilization directly influence new product performance. Similarly, Ottum and Moore (1997) found that new product success is most closely linked to information use. More recently, Keh et al. (2007) found that information use had a direct impact on the performance of small- and medium-sized firms, while information acquisition indirectly influenced performance through its impact on information utilization.

Importantly, existing studies of market information processes have not distinguished between formal and information market information processes. For this reason, Moorman (1995) called for future research that explicitly addressed the performance impact of formal processes for market information acquisition and use. Insights from studies of strategic planning in small firms suggest that formal market information processes may have value for new ventures. Castrogiovanni (1996) argued that formal planning processes stimulate learning, increase venture efficiency, and improve coordination. In addition, formal plans can help entrepreneurs clarify goals and objectives and improve their analysis of complex activities (Shane and Delmar, 2004).

It seems reasonable to expect that the use of formal market information processes should yield similar benefits to start-up firms, but there is limited empirical evidence to support this expectation. In a meta-analysis of planning processes in small firms, Schwenk and Shrader (1993) found that formal strategic planning has a positive impact on firm performance. More recently, Coviello et al. (2000) reported that managers in small firms believed their firms would benefit from the use of formal planning processes. However, they did not examine the relationship between formal marketing processes and performance.

While the market orientation literature has emphasized the processes a firm uses to collect market information, a related stream of research has focused specifically on processes designed to collect information about customers (Day and Wensley, 1988; Griffin and Hauser, 1993; Campbell, 2003; Li and Calantone, 1998). Li and Calantone (1998) defined a firm's customer knowledge competence as processes designed to generate, structure, and organize intelligence about customers. Their empirical work indicates that the level of customer knowledge has a positive effect on new product advantage. Similarly, Joshi and Sharma (2004) found a positive relationship between customer knowledge development and new product performance. More recently, De Luca and Atuahene-Gima (2007) found that product innovation is a positive function of customer knowledge breadth, depth, and specificity.

These findings are consistent with findings in the entrepreneurship literature regarding the value of customer interaction. For example, Coviello et al. (2000) reported that, relative to large firms, small firms place relatively greater emphasis on direct relationships with specific customers. More recently, Chrisman et al. (2005) found that the explicit and tacit knowledge generated through customer interaction has a significant impact on new venture survival and growth.

Studies of organizational learning suggest that environmental factors can moderate the way in which market information processes influence firm performance (Sinkula, 1994; Baker and Sinkula, 2007; Menon and Varadarajan, 1992; Hanvanich et al., 2006). Unanticipated changes in the environment in general, and customer preferences in particular, create instability and increase the importance of adaptive skills (Lusch and Laczniak, 1987). Effective firms discern and respond to such changes based on their knowledge of changing market conditions (Achrol et al., 1983). For these reasons, the importance of a firm's market information processing capabilities should increase when market uncertainty increases. In the next section we use these insights to develop a contingency model of the information processes–performance relationship.

4. Conceptual framework

In this section we develop explicit hypotheses linking a firm's market information processes to firm performance. Fig. 1 summarizes our theoretical model. We hypothesize that (1) customer interaction processes and formal processes for market

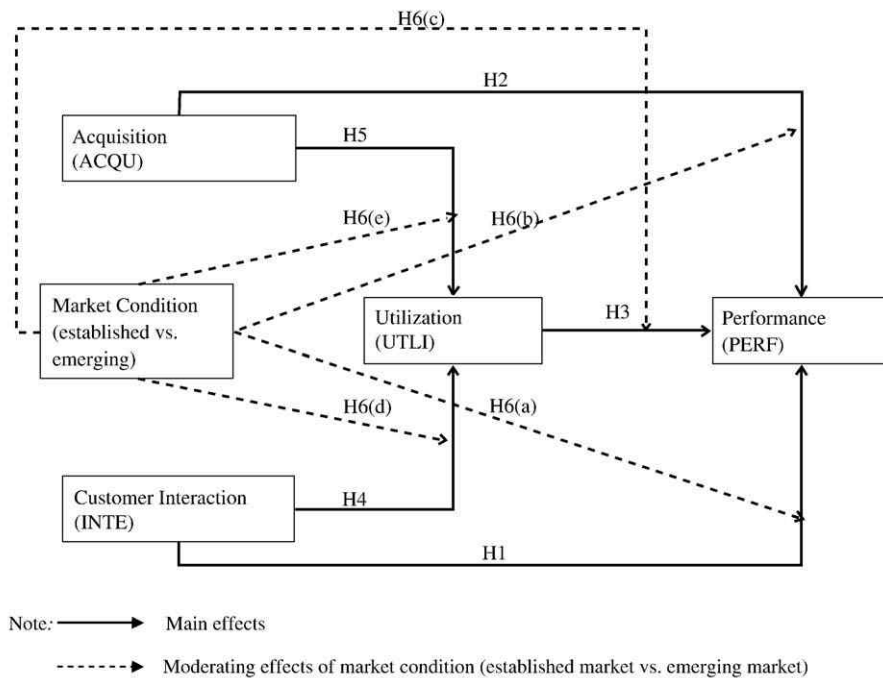


Fig. 1. Conceptual framework of market information processes and new venture performance.

information collection influence the use of formal processes for market information utilization and (2) all three processes influence new venture performance. We further hypothesize that each of these relationships will be greater in markets with high uncertainty. To simplify our presentation, we first develop our hypotheses for new ventures serving established markets and then extend these hypotheses to ventures serving emerging markets.

4.1. Market information processes and performance

Consistent with prior discussions of customer knowledge (e.g., Li and Calantone, 1998, p. 14), we define *customer interaction processes* as a set of behavioral activities designed to continuously (1) collect information through direct interactions with customers and (2) process collected information. These activities enable the firm to collect, organize, and structure customer intelligence (Campbell, 2003; Morgan et al., 2005; Griffin and Hauser, 1993). These processes may include meeting with customers to learn about their current and potential needs for new products, analyzing customer information, and using customers to test and evaluate new products or services. Firms can use the information generated by these processes to develop new products that deliver benefits that are valued by target customers and unavailable from competitive product offerings (Day, 1994). In addition, this information can help the firm craft strategies designed to maintain customer relationships and increase customer loyalty (Kohli and Jaworski, 1990; Yli-Renko et al., 2001). This reasoning is supported by empirical studies indicating that customer knowledge competence can enhance relative product advantage (Day, 1994; De Luca and Atuahene-Gima, 2007; Li and Calantone, 1998) and favorably influence the new venture's probability of survival and growth (Chrisman et al., 2005). These considerations suggest the following hypothesis:

H1. In established markets, new venture performance is positively related to the use of customer interaction processes.

Acquisition refers to the collection of primary and secondary information from both internal and external resources (Moorman, 1995; Rindfleisch and Moorman, 2001). It includes processes for acquiring information about customers, competitors, supply chain partners, and others who influence customers' decisions, as well as information about the technological, legal, and regulatory environment within which the firm operates. The use of this information helps firm managers identify opportunities and threats and thus facilitates effective strategy development (Soh, 2003; Kaish and Gilad, 1991; Ozgen and Baron, 2007; Moorman, 1995).

We define *formal market information acquisition processes* to be documented policies and procedures for the collection of primary or secondary information from organizational stakeholders. Notice that this construct is conceptually distinct from customer interaction processes, which focuses on actual behavior (i.e., to what extent does the firm actually interact with customers?). In contrast, the formal market information acquisition processes construct focuses on policies and procedures that specify the information acquisition behaviors that *should* be performed by employees. Castrogiovanni (1996) and Shane and Delmar (2004) identify several benefits of formal business planning processes that should extend to the use of formal processes for

the acquisition of market information. In particular, formal processes can help clarify the goals and objectives of the venture's information acquisition activities and improve the efficiency of those activities. Because these benefits should improve information timeliness and decrease the likelihood of neglecting important sources of information in favor of more easily available information sources (Day, 1994; Day and Nedungadi, 1994), we hypothesize that:

H2. In established markets, new venture performance is positively related to the use of formal processes for market information acquisition.

Utilization is defined as the direct or indirect use of market information in decision-making and problem-solving (Moorman, 1995; Menon and Varadarajan, 1992). Examples of utilization processes include using market information to solve specific problems, providing feedback to decision makers, and evaluating project outcomes (Moorman, 1995). Existing research indicates that utilization processes have a positive impact on both new product development and firm performance (Moorman, 1995; Keh et al., 2007).

We define *formal market information utilization processes* to be documented policies and procedures that specify how market information should be used to make decisions. For several reasons, we expect that formal processes for information utilization will enhance new venture performance. First, both Castrogiovanni (1996) and Shane and Delmar (2004) argue that formal utilization processes can enhance the way managers think about problems and increase the amount and the variety of information used to make decisions. In addition, formal processes help managers prioritize information by serving as a form of organizational memory that incorporates learning from previous decision processes and outcomes (Day, 1994). Formal processes can also reduce the time needed to make strategic and tactical decisions. Finally, formal utilization processes can help simplify the tasks of identifying implementation issues and developing plans to address those issues (Castrogiovanni, 1996). Taken together, these considerations suggest the following hypothesis:

H3. In established markets, new venture performance is positively related to the use of formal processes for market information utilization.

4.2. Antecedents of formal processes for information utilization

For several reasons, firms that have continuous interactions with customers will seek to ensure that their strategic decisions reflect the information gathered from customers. Existing research indicates that the likelihood of information use is an increasing function of the cost of that information (Sinkula, 1994). Furthermore, intense interaction is more likely to yield information that is perceived as meaningful and valid, which also increases the likelihood of information use. As the perceived importance of information rises, firms are more likely to adopt strategies to ensure that the collected information is actually used. Studies of formal planning in small firms (Coviello et al., 2000; Chrisman et al., 2005) suggest that one useful strategy for encouraging information utilization is the development of formal processes for using market information. Thus we expect that formal processes for information utilization will be an increasing function of the new venture's customer interaction processes. In addition, firms that have formal processes for information collection are more likely to recognize the value of formal processes for information utilization. Thus we hypothesize that:

H4. In established markets, the use of formal market information utilization processes is positively related to the use of customer interaction processes.

H5. In established markets, the use of formal market information utilization processes is positively related to the use of formal processes for market information acquisition.

4.3. The moderating effects of established versus emerging markets

Market uncertainty refers to changes in the "composition of customers and their preferences" (Kohli and Jaworski, 1990, p. 14). When customer segments and preferences are stable, new ventures can design marketing strategies based on their existing knowledge of customers. If the firm's marketing mix accurately reflects these preferences, the firm's marketing mix may also remain stable over time. However, when market turbulence is high, the value of the firm's existing stock of knowledge declines. To adapt to changing customer preferences and the emergence of new customer segments, firms must interact intensely with customers. Thus we expect that the impact of customer interaction on performance will be relatively higher in emerging markets. Similarly, we expect that the impact of formal processes for information acquisition and utilization on new venture performance will be relatively higher in emerging markets. Thus we hypothesize that:

H6 (a)–(c). The positive relationships between new venture performance and (a) customer interaction, (b) acquisition, and (c) utilization are higher in emerging markets than in established markets.

When customer segments and preferences are stable, the value of formal processes for information utilization declines, in part because the firm encounters less new information (relative to firms in emerging markets). In addition, as noted above, firms serving established markets are more likely to have a stable marketing mix over time. As a result, the incremental value of formal information utilization processes is lower for firms that serve established markets. For this reason, variations in the use of formal

processes for information collection and customer interaction are relatively less likely to be associated with variations in the use of formal processes for information utilization. This reasoning suggests that:

H6 (d)–(e). The positive relationships between utilization and (d) customer interaction and (e) acquisition are higher in emerging markets than in established markets.

5. Method

5.1. Survey development

To measure the constructs in our theoretical model, we adopted existing items from the marketing and innovation literatures. To ensure content validity and the appropriateness of items for studying new ventures, we pretested the survey through in-depth focus interviews with six founders of four new ventures. The interviews consisted of three parts. First, founders were asked for their opinions regarding the usefulness of market information in their new ventures. In particular, we wanted to investigate the nature of market information collection and the best way to measure market information activities. Second, the founders were asked to evaluate whether our study hypotheses describe their own experiences adequately. The third part of the interviews addressed founders' perceptions of the relevance and completeness of scale items drawn from the literature. Each founder was asked to complete the survey in the presence of one of the researchers. The pre-test participants had no problems responding to the 7-point scales used in the questionnaires. Several questionnaire items were modified based on suggestions from these participants.

5.2. Data collection

Our sampling frame consisted of (1) venture-backed firms listed between 1995 and 2004 in the VentureOne database and (2) new venture firms that were members of the 1995–2000 *Inc 500*. VentureOne, which is the most comprehensive database of its kind in the United States, contains information about venture-backed firm employment, business status, and ownership status (Cochrane, 2005; Gompers and Lerner, 2000; Gompers et al., 2005). For the 1995–2004 time period, this database contained complete information on 7720 venture-backed firms. The *Inc 500* database includes the fastest-growing private companies in the United States, as selected by *Inc* magazine. Due to budgetary constraints, we randomly selected 750 venture-backed new ventures from the VentureOne database and the 250 fastest-growing new ventures from the *Inc 500*. In 2007, we mailed each firm a packet that included a personalized letter, the survey, and a return envelope with an individually-typed return-address. From the initial mailing, 134 mailing packages were returned due to undeliverable addresses or names, reducing the sample size to 866. After four follow-up letters, we received a total of 148 completed questionnaires, representing a response rate of 17% by September 30, 2007.

To increase our response rate, in October 2007 we resent our survey to the 718 non-responding firms using priority mail. After one follow-up mailing, we received an additional 111 completed surveys from this second data collection, which increased the total number of usable surveys to 259 (a total response rate of 29.9%).

In 2008 we contacted all 259 firms that responded to our original survey and requested information regarding their profit margin (profit divided by revenue). Of the original 259 respondents, 224 provided this information, representing 86% of the respondents to the first survey and 26% of the original sample. The age of respondent firms ranged from 0 to 7 years, and the number of employees ranged from 11 to 450.

We used several variables to test for the presence of non-response bias. We found no significant differences in firm size ($F = 0.32, p > 0.10$) and firm age ($F = 0.10, p > 0.10$) between the participating firms and non-participating firms. We also found no significant difference in the fraction of firms representing the following industries: textile and clothes ($F = 0.02, p > 0.10$), pharmaceutical and medicines ($F = 0.03, p > 0.10$), consumer electronics and electrical equipment ($F = 0.02, p > 0.10$), semiconductors and computer related products ($F = 0.00, p > 0.10$), and home appliances ($F = 0.05, p > 0.10$). Based on these results, non-response bias does not appear to be a problem in our data.

5.3. Study measures

Appendix A presents the scale items used to measure each construct. Deleted items are marked with an asterisk. The end points for each scale item ranged from 1 (Strongly Disagree) to 7 (Strongly Agree) for all activities involved with market information. *Customer Interaction* is based on a five-item scale developed by Li and Calantone (1998). Our confirmatory factor analyses led us to drop three problematic items. Because one deleted item addressed the outcomes of customer interaction (does the company have sufficient customer knowledge?) rather than behavior, it appeared to be a reasonable candidate for deletion. The second deleted item addressed the use of customer research techniques such as surveys or focus groups. Because existing research indicates that small firms are relatively less likely to rely on these kinds of survey techniques (Mohan-Neill, 1995; Callahan and Cassar, 1995), the deletion of this item also appeared reasonable. The third deleted item, which was reverse coded, had low correlations with the two remaining question items, which measure the degree to which new venture employees meet regularly with customers to learn their needs and systematically process and analyze customer information.

Acquisition is adapted from a five-item scale developed by Moorman (1995). The items in this scale address whether the firm has formal processes for collecting information from various information sources. In this case our confirmatory factor analyses led

us to drop two problematic items that measured whether the firm had formal processes for collecting information about (1) competitor activities and (2) relevant publics other than customers and competitors. The remaining items address the use of formal processes for collecting information from customers, reexamining the value of information collected in previous studies, and collecting information from external experts. Relative to the original scale, the refined scale appear to be more closely aligned with the customer interaction scale, in the sense that the latter measures customer interaction behavior while the former measures the existence of policies and procedures to guide the collection of customer information.

Utilization is adapted from a seven-item scale developed by Moorman (1995). These items address whether the firm has formal processes for utilizing market information. Based on our confirmatory factor analyses we dropped four items from this scale. Two of the deleted items dealt with project evaluation and reliance on market information. Two additional deleted items addressed the dissemination of market information to functions/departments and the role of market information providers in strategy formation. The remaining items measure the use of formal processes that use market information for solving specific problems, for providing feedback to decision makers, and as an aid for project decision-making.

Our performance measure, *Profit Margin*, is measured as the ratio of firm profit to firm revenue in the firm's most recent fiscal year. We also included two control variables in our analysis. Firm size is measured as the number of employees at the time of our first survey, and firm age is measured as the number of years between the time the firm was founded and the time of our first survey.

We also asked respondents to classify their primary market as either an established market or an emerging one. *Market Condition* is a categorical variable that takes the value 1 if customer needs are well-defined and stable (established market), and 2 if customer needs are not well-defined and are changing (emerging market). In order to examine the validity of this classification, we also asked respondents to indicate the strength of their agreement or disagreement with the following items: (1) Market needs are well-defined in this industry; (2) We are witnessing demand for our products and services from customers who never bought them before; and (3) New customers tend to have product-related needs that are different from those of existing customers. The correlation between the mean of these three items (computed after reversing the first item) and Market Condition was 0.56 ($p < 0.01$), indicating that the categorical variable is a reliable measure of the stability of customer preferences and market segment composition.

6. Analyses

To test our research hypotheses, we followed the two-step approach for structural equation modeling recommended by Anderson and Gerbing (1988). In the first step, we assessed and validated the psychometric properties of the measurement model and purified measures. In the second step we estimated the structural equation model depicted in Fig. 1.

6.1. Measurement model

We began with a series of confirmatory factor analyses designed to identify problematic items. After deleting these items, we evaluated the final measurement model on four criteria: convergent validity, discriminant validity, and unidimensionality and reliability. The results, which are summarized in Table 1, indicate that the measurement model fits the data well. In particular, the overall fit indices all exceed the critical level of 0.90 (GFI = 0.97, CFI = 0.97, IFI = 0.97). In addition, RMSEA is less than critical level of 0.10 (RMSEA = 0.05) and the ratio $\chi^2/\text{d.f.}$ is less than 2 (Bentler, 1990). The standardized loadings of all measurement items are highly significant (the smallest t -value is 2.69), demonstrating adequate convergent validity.

Examinations of the modification indices, residuals, and overall fit indices reveal no substantial departures from unidimensionality. The construct reliabilities are reported in Table 1. The composite reliabilities range from 0.68 to 0.74, indicating that the measures are highly reliable. Examination of the pattern of standardized residuals further indicates that there is

Table 1
Measurement model summary.

Constructs	Item	Standardized factor loading	Goodness-of-fit statistics	Composite reliability	Discriminant validity			
ACQU	ACQU1	0.50***	$\chi^2 = 26.98$ d.f. = 17	0.68	ACQU	0.65	INTE	UTIL
	ACQU4	0.65***						
	ACQU5	0.76***						
INTE	INTE1	0.93***	$\chi^2/\text{d.f.} = 1.59$ GFI = 0.97	0.74	INTE	0.11	0.77	
	INTE4	0.57***						
UTIL	UTIL2	0.88***	CFI = 0.97 IFI = 0.97 RMSEA = 0.05	0.72	UTIL	0.63***	–0.19*	0.69
	UTIL4	0.68***						
	UTIL6	0.44***						

The smallest factor loading t -statistic is 2.69 for INTE1.

ACQU = Acquisition, INTE = Customer Interaction, UTIL = Utilization.

Please see Appendix A for the question items.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

no deviation from the external consistency criteria of Anderson and Gerbing (1982). The largest standardized-residual variance is 1.93 and less than 2.58, which is also consistent with unidimensionality.

To assess discriminant validity, we first computed the square root of the average variance explained ($\sqrt{\text{AVE}}$) for each construct. As shown in last column of Table 1, for each construct, the relevant $\sqrt{\text{AVE}}$ is larger than the correlation between any pair of the two constructs in this study, indicating that the constructs have discriminant validity (Fornell and Larcker, 1981). In particular, our analysis clearly indicated that consumer interaction processes and formal processes for market information acquisition were distinct constructs.

Based on the preceding analyses, we concluded that the hypothesized measurement model adequately fit the data and that testing of the structure model was appropriate. Table 2 contains descriptive statistics for the purified measurement model, including variable means, standard errors, and correlations.

7. Results

To test the hypothesized model, we split the sample into two groups: one consisting of new ventures facing an established primary market (107 firms) and the second consisting of new ventures facing an emerging primary market (117 firms). We then estimated a two-group structural equation model (Anderson and Gerbing, 1988). The results of the analysis are summarized in Fig. 2. The goodness-of-fit statistics suggest that the two-group full structural model fits the data well ($\chi^2 = 96.21$, d.f. = 68, $\chi^2/\text{d.f.} = 1.41$, GFI = 0.93, CFI = 0.94, IFI = 0.94, RMSEA = 0.04).

We then compared the unconstrained models with a series of single-constraint models, each of which forced one model coefficient to be equal across groups. If we found that the unconstrained model had a significantly better overall fit than the constrained model, we concluded that the focal path coefficient was significantly different for established and emerging markets.

Fig. 2 reports the parameter estimates and significance levels for each path in the two-group structural equation model. Within established markets, we found that formal processes for market information utilization ($\beta = 11.61$, $p < 0.01$) positively influence performance. In addition, we found that formal processes for market information acquisition ($\beta = 0.92$, $p < 0.01$) positively influence the use of formal processes for market information utilization. These results support hypotheses H3 and H5. In contrast, customer interaction has a negative and significant impact ($\beta = -0.36$, $p < 0.01$) on the use of formal processes for market information utilization. Neither formal processes for market information acquisition nor customer interaction has a significant effect on performance. These results fail to support hypotheses, H1, H2, and H4.

Within emerging markets, we found that formal processes for market information acquisition positively influence performance ($\beta = 5.83$, $p < 0.01$) and that formal processes for market information utilization also increase performance ($\beta = 5.61$, $p < 0.01$). In addition, we found that formal processes for market information acquisition ($\beta = 0.41$, $p < 0.01$) positively influence the use of formal processes for market information utilization. However, the coefficient linking performance to the level of customer interaction is not significant, while the coefficient linking the level of customer interaction with formal processes for market information utilization is negative and significant ($\beta = -0.20$, $p < 0.10$).

With regard to between group differences, we hypothesized that the positive effects of customer interaction and formal processes for market information acquisition and utilization would be greater in emerging markets than in established markets. In general, this hypothesis was not supported (Table 3). Our analysis does indicate that the relationship between formal processes for market information acquisition and performance is significantly higher in emerging markets relative to established markets ($\Delta\chi^2_{(1)} = 5.05$, $p < 0.05$) which supports Hypothesis H6(b). However, we also found that the positive relationship between formal processes for market information utilization and performance is significantly higher in established markets relative to emerging markets ($\Delta\chi^2_{(1)} = 2.73$, $p < 0.10$), which contradicts hypothesis H6(c). In addition, the positive relationship between formal processes for market information acquisition and utilization is significantly higher in established market compared to emerging

Table 2

Descriptive statistics: mean, standard deviation, correlation matrix.

	N	Mean	SD	ACQU1	ACQU4	ACQU5	INTE1	INTE4	UTIL2	UTIL4	UTIL6	PERF	Age	Size
ACQU1	224	4.74	1.59	1.00										
ACQU4	224	3.82	1.71	0.39***	1.00									
ACQU5	224	4.82	1.72	0.36***	0.48***	1.00								
INTE1	224	4.77	1.68	0.09	0.02	0.11	1.00							
INTE4	224	3.99	1.68	0.11	-0.08	0.00	0.53***	1.00						
UTIL2	224	4.93	1.73	0.22***	0.36***	0.44***	-0.15**	-0.16**	1.00					
UTIL4	224	4.83	1.68	0.18***	0.31***	0.37***	-0.05	-0.10	0.59***	1.00				
UTIL6	224	4.01	2.30	0.08	0.12*	0.14**	-0.21***	-0.02	0.39***	0.31***	1.00			
PERF	224	15.71	18.10	0.35***	0.38***	0.49***	-0.01	0.06	0.58***	0.42***	0.26***	1.00		
Age	224	2.91	1.83	-0.02	-0.03	0.06	-0.07	-0.10	0.05	-0.03	-0.05	-0.06	1.00	
Size	224	87.87	80.04	-0.04	-0.10	-0.04	0.05	0.05	0.03	0.05	-0.03	-0.02	0.06	1.00

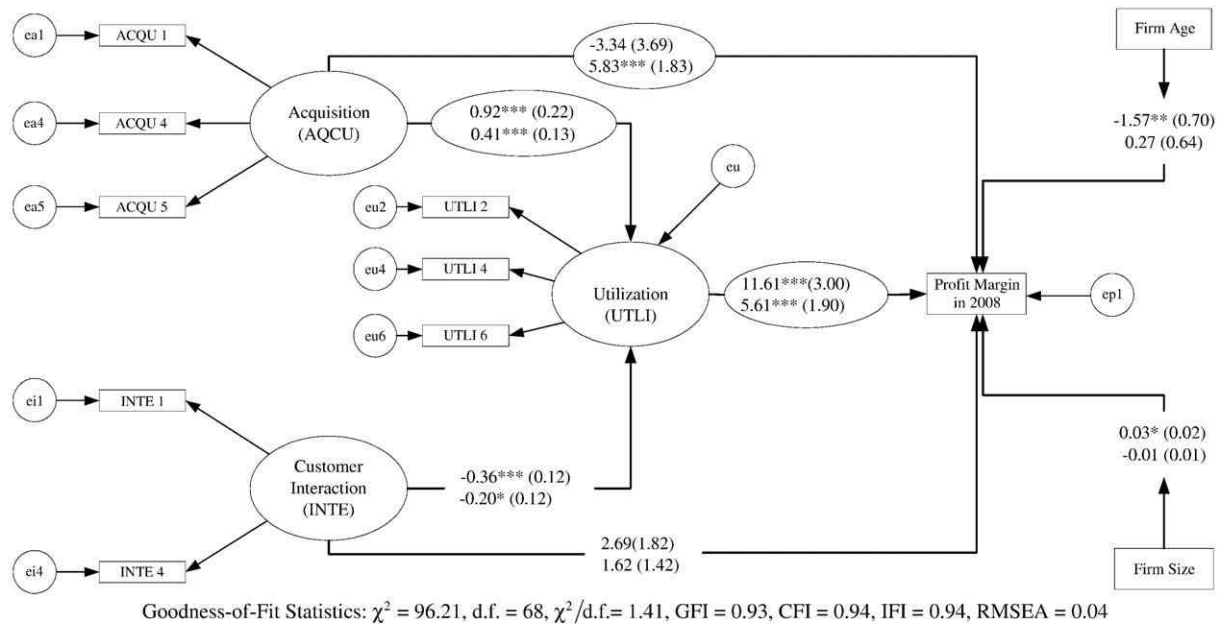
ACQU = Acquisition, INTE = Customer Interaction, UTIL = Utilization, PERF = Profit Margin in 2008.

Please see Appendix A for the question items.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.



Notes:

a: *, $p < 0.10$, **, $p < 0.05$, ***, $p < 0.01$. The number in parentheses is the path coefficient standard error.

b: The top number for each path is the path coefficient for the established market group (107 firms); the lower number for each path is the path coefficient for the emerging market group (117 firms).

c: Circled pairs of path coefficients indicate that the coefficients are significantly different across the two groups.

Please see Appendix A for the question items.

Fig. 2. Results of two-group analysis by full-information structural equation model.

market ($\Delta\chi^2_{(1)} = 4.27$, $p < 0.05$), which contradicts hypothesis H6(e). Finally, the coefficients linking customer interaction with performance H6(a) and customer interaction with utilization H6(d) do not vary significantly depending on market condition. Table 4 summarizes the results of our hypotheses tests.

8. Conclusions

In this paper we have developed a conceptual model linking two kinds of information processes to new venture success. We hypothesized that new venture performance is an increasing function of (1) the use of processes designed to create continual interaction with customers and (2) the use of formal procedures for collecting and utilizing market information. We also

Table 3

Two-group analysis: hypotheses testing.

Structural model	Goodness-of-fit	Test of hypotheses
Model 1: Hypothesized model	$\chi^2_{(68)} = 96.21$, $\chi^2/\text{d.f.} = 1.41$, GFI = 0.93, CFI = 0.94, IFI = 0.94, RMSEA = 0.04	Test for Hypotheses 1, 2, 3, 4, and 5.
Model 2: Set path coefficient from <i>Customer Interaction</i> to <i>Performance</i> to be equal across two groups	$\chi^2_{(69)} = 96.35$, $\chi^2/\text{d.f.} = 1.40$, GFI = 0.93, CFI = 0.94, IFI = 0.95, RMSEA = 0.04	Test for Hypothesis 6(a) Model 2–Model 1: $\Delta\chi^2_{(1)} = 0.14$, not significant at $p = 0.10$
Model 3: Set path coefficient from <i>Acquisition</i> to <i>Performance</i> to be equal across two groups	$\chi^2_{(69)} = 101.26$, $\chi^2/\text{d.f.} = 1.47$, GFI = 0.92, CFI = 0.93, IFI = 0.94, RMSEA = 0.05	Test for Hypothesis 6(b) Model 3–Model 1: $\Delta\chi^2_{(1)} = 5.05$, significant at $p = 0.05$
Model 4: Set path coefficient from <i>Utilization</i> to <i>Performance</i> to be equal across two groups	$\chi^2_{(69)} = 98.94$, $\chi^2/\text{d.f.} = 1.43$, GFI = 0.92, CFI = 0.93, IFI = 0.94, RMSEA = 0.04	Test for Hypothesis 6(c) Model 4–Model 1: $\Delta\chi^2_{(1)} = 2.73$, significant at $p = 0.10$
Model 5: Set path coefficient from <i>Customer Interaction</i> to <i>Utilization</i> to be equal across two groups	$\chi^2_{(69)} = 96.74$, $\chi^2/\text{d.f.} = 1.40$, GFI = 0.93, CFI = 0.94, IFI = 0.94, RMSEA = 0.04	Test for Hypothesis 6(d) Model 5–Model 1: $\Delta\chi^2_{(1)} = 0.53$, not significant at $p = 0.10$
Model 6: Set path coefficient from <i>Acquisition</i> to <i>Utilization</i> to be equal across two groups	$\chi^2_{(69)} = 100.48$, $\chi^2/\text{d.f.} = 1.46$, GFI = 0.92, CFI = 0.93, IFI = 0.94, RMSEA = 0.05	Test for Hypothesis 6(e) Model 6–Model 1: $\Delta\chi^2_{(1)} = 4.27$, significant at $p = 0.05$

hypothesized that these linkages will be stronger among new ventures serving emerging markets (i.e., markets in which customer needs and segments are evolving). We tested these hypotheses using data collected from 224 new ventures located in the United States.

Our findings indicate that, regardless of market conditions, formal processes for the collection of market information are positively associated with the use of formal processes for market information utilization, and this relationship is stronger in established markets. In addition, new venture performance is an increasing function of the use of formal processes for utilizing market information, and the impact is again stronger in established markets. We also found that, in emerging markets, the use of formal processes for collecting market information has a direct, positive and significant relationship with new venture performance.

We also found two surprising results. Contrary to our hypotheses, our findings suggest that formal processes are more valuable in established markets. We also found a negative relationship between the level of customer interaction and the level of formal processes for information utilization.

Our research has several important implications for entrepreneurs. Regardless of whether new ventures serve established or emerging markets, our findings indicate that new ventures can enhance their performance by adopting formal processes for market information acquisition. From a practical perspective, a formal process should (1) identify potential sources of market information (e.g., customer visits, trade shows, publications, etc.) and the kinds of information potentially available from each source, and (2) specify the frequency with which information should be collected from these sources. The process should also identify who is responsible for collecting information from each source. In addition, because important information may surface outside of scheduled collection activities, there should be a process to ensure that this “unscheduled” information is captured, stored, and made available to decision makers.

Because new ventures typically have limited resources (Mohan-Neill, 1995) and because the value of information varies across sources, it may be necessary to prioritize the firm's information sources and access some more frequently than others. The potential danger of this prioritization is that, as a result of changes in customer preferences or the emergence of new customer segments, an information source that is perceived to be relatively unimportant now may become important in the future. For this reason, the venture should make the reasons for its prioritization decisions explicit and have a process for revising its prioritization of information sources in response to new information about market trends.

We also find that new ventures can benefit from the use of formal processes for market information utilization. The goals of a formal information utilization process typically include broadening the array of decision options considered, expanding the kinds of information used to evaluate those options, and developing a fuller understanding of the various implications arising from the information collected by the firm. Thus the firm may find it helpful to formally require the identification of decision options and a review of available information and its implications. In addition, it may be useful to specify the people that are responsible for various steps in the information utilization process.

Table 4
Summary of results of hypothesis testing.

Hypothesis	Result	Comments
<i>Main effects</i>		
H1: In established markets, new venture performance is positively related to the use of customer interaction processes.	Not supported	
H2: In established markets, new venture performance is positively related to the use of formal processes for market information acquisition.	Not supported	
H3: In established markets, new venture performance is positively related to the use of formal processes for market information utilization.	Supported	
H4: In established markets, the use of formal market information utilization processes is positively related to the use of customer interaction processes.	Not supported	A firm with higher levels of customer interaction relies less on formal processes for information utilization.
H5: In established markets, the use of formal market information utilization processes is positively related to the use of formal processes for market information acquisition.	Supported	
<i>Moderating effects</i>		
H6(a): The positive relationships between new venture performance and customer interaction are higher in emerging markets than in established markets.	Not supported	
H6(b): The positive relationships between new venture performance and acquisition are higher in emerging markets than in established markets.	Supported	
H6(c): The positive relationships between new venture performance and utilization are higher in emerging markets than in established markets.	Not supported	Formal processes for market information utilization have a greater impact on new venture performance in established markets than in emerging markets.
H6(d): The positive relationships between utilization and customer interaction are higher in emerging markets than in established markets.	Not supported	
H6(e): The positive relationships between utilization and acquisition are higher in emerging markets than in established markets.	Not supported	Formal processes for market information acquisition are more strongly associated with formal processes for utilization in established markets than in emerging markets.

One potential danger of a formal information process is a lengthening of the time required to make a decision. Thus it may be helpful to monitor the time needed to make decisions, look for opportunities for parallel processing, and identify potential shortcuts for use when quick decisions are needed. A second danger is that formal processes for information utilization may contain implicit judgments about attractive versus unattractive decision options, as well as useful versus non-useful information. Often these judgments are based on the firm's existing understanding of the markets it serves and its competitive environment. To ensure that the firm's formal processes do not impede effective decision-making, these implicit judgments should be made explicit and the firm should have a process for revising these judgments based on new information.

8.1. Limitations and directions for future research

Our conclusions must be qualified in several ways. First, because our sampling frame consisted of venture-backed firms and firms listed in the *Inc 500*, our respondents represent rapidly-growing firms. Moreover, we surveyed existing new ventures, so our results may be affected by survivor bias. Second, we relied on single informants to provide insight into the information processes of respondent firms. Because these firms are start-up ventures, there are good reasons to believe that most of our respondents were well-acquainted with these processes, and that the incremental value of multiple informants would have been small. Nevertheless, it is possible that in some of the larger firms in our sample, respondents may have had incomplete information about the data collection processes within their firms.

Third, our study focused on the use of formal processes for information acquisition and use. Under some conditions, informal processes may be as effective (or more effective) than formal processes. Finally, because our data was collected from start-up ventures in the U.S., establishing the generalizability of our results is an important topic for future research.

Additional research opportunities arise from the unexpected findings reported above. First, we hypothesized that the value of formal processes would be greater in emerging markets, because formal processes can help ensure that (1) information acquisition efforts are comprehensive in terms of the sources used to collect information and the breadth of the information collected from these sources, and (2) information utilization efforts are comprehensive in terms of the information used to make and implement strategic and tactical decisions. However, our findings suggest that formal processes are more valuable in established markets. One possible explanation for this result is that, among the new ventures in our sample, formal acquisition and utilization processes were not comprehensive.

In part, a lack of comprehensiveness may be a natural consequence of the way in which formal processes evolve in many firms. Given the human and financial resource constraints faced by start-up firms (Mohan-Neill, 1995), it is possible that the formal processes developed by new ventures tend to focus on general guidelines that lack detail. As the firm matures and its resources expand, the employees responsible for market information acquisition and utilization change. To ensure that knowledge is preserved and transferred within the organization, these guidelines evolve into more detailed processes that reflect the firm's accumulated experience within its served markets (Abernathy and Utterback, 1978). To test this explanation, future research should explicitly measure the comprehensiveness of formal processes for information collection/use and assess the relationship between comprehensiveness and performance.

Formal processes may also lack comprehensiveness because they are based on existing knowledge about customers and markets (Day, 1994). For example, the firm's formal processes for allocating information acquisition efforts across information sources may reflect existing perceptions about the importance of different information sources. As a result, when customer states are changing or new segments are emerging, prioritizations based on existing knowledge may lead to delays in detecting emerging market trends. Similarly, formal utilization processes that prioritize information based on existing knowledge may lead firms to undervalue information about changing customer tastes or emerging segments when making product design or communication decisions. Thus future research should explore the degree to which the formal information processes used by new ventures constrain the ways in which market information is collected and used within the firm.

A second surprising result involves the negative relationship between the level of customer interaction and the level of formal processes for information utilization. One possible explanation for this result is that, as a result of close interactions with customers, firms feel confident about customer reactions to product and communication initiatives. As a result, the perceived benefits of formal information processes may be lower than the perceived cost of establishing such procedures. This explanation could be tested by measuring the perceived benefits that entrepreneurs attribute to formal processes for market information utilization and examining the correlation between perceived benefits and the level of customer interaction.

Another possible explanation for the negative relationship between customer interaction and the use of formal information utilization processes is that firms with high level of customer interaction use less market information in their decision-making processes.² If this explanation is correct, then firms with high levels of customer interaction should report less informal use of market information. To test this possibility, future research should collect separate measures of formal and informal processes for information utilization.

Other research opportunities arise from extensions of the theoretical model examined in this paper. The research described here focused on the direct impact of market information processes on firm performance. We believe that this focus is appropriate in start-up ventures, which lack established product lines that generate significant revenue for the firm. In larger, more mature firms, it may be useful to distinguish between the impact of market information processes on (1) new product development and (2) the management of established products (Moorman, 1995).

² The authors thank an anonymous reviewer for this observation.

Finally, the direct positive link in emerging markets between new venture performance and information acquisition involves mechanisms that are not captured in the market utilization variable (e.g., the use of market information for strategy development, project decisions, and problem-solving). An unresolved issue involves the identification of these mechanisms and an assessment of their relative importance. For example, formal information acquisition processes might affect the ability of the firm to build stronger relationships with customers, supply chain partners, and investors. We hope that the analysis presented here will encourage other researchers to address these topics in future research.

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Appendix A

Study Constructs and Measures

Below we list some characteristics about how a company collects and uses market information. Please circle the number next to each statement indicating the level of your disagreement or agreement (where 1 = Strongly disagree and 7 = Strongly agree).

ACQU (Acquisition)

- ACQU1. Our company has formal processes for continuously collecting information from customers.
- ACQU2. Our company has formal processes for continuously collecting information about competitors' activities.*
- ACQU3. Our company has formal processes for continuously collecting information about relevant publics other than customers and competitors.*
- ACQU4. Our company has formal processes for continuously reexamining the value of information collected in previous studies.
- ACQU5. Our company has formal processes for continuously collecting information from external experts, such as consultants.

INTE (Customer Interaction)

- INTE1. Our company regularly meets customers to learn their current and potential needs for new products.
- INTE2. Our company has sufficient knowledge on the needs of our customers.*
- INTE3. Our company regularly uses research procedures (e.g. focus groups and surveys) to gather customer information.*
- INTE4. Our company systematically processes and analyzes customer information.
- INTE5. Our company seldom uses customers to test and evaluate new products. (R)*

UTIL (Utilization)

- UTIL1. Our company has formal processes that rely heavily upon market information to make decisions.*
- UTIL2. Our company has formal processes that use market information to solve specific problems.
- UTIL3. Our company has formal processes that give market information to all functions/departments regarding their role in implementation.*
- UTIL4. Our company has formal processes that provide feedback to decision makers regarding the outcomes of their decisions.
- UTIL5. Our company has formal processes that constructively evaluate project outcomes using market information.*
- UTIL6. Our company value market information as an aid to decision-making regarding projects.
- UTIL7. Our company structures jobs so that market information providers play a role in strategy development.*

Profit Margin: Income before Taxes/Total Revenue

Market condition (established market or emerging market)

Our primary served markets are: (1) established (customer needs are well-defined and are stable) or (2) emerging (customer needs are not welldefined and are changing)

Firm size

How many full-time employees does your company have?

Firm age

How many years have passed since your company was founded?

Note: "*" denotes item deleted as part of the CFA measurement refinement process.

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