The Age–Effect of Financial Indicators as Buffers against the Liability of Newness

Article *in* Journal of Business Venturing · July 2010

DOI: 10.1016/j.jbusvent.2008.10.011 · Source: RePEc

3 authors:

Johan Wiklund
Syracuse University
115 PUBLICATIONS **8,672** CITATIONS
SEE PROFILE

Ted Baker
Rutgers Business School - Newark and New B…
49 PUBLICATIONS **2,088** CITATIONS
SEE PROFILE

Dean A. Shepherd
Indiana University Bloomington
262 PUBLICATIONS **12,604** CITATIONS
SEE PROFILE

Journal of Business Venturing 25 (2010) 423–437

Contents lists available at ScienceDirect

Journal of Business Venturing

The age-effect of financial indicators as buffers against the liability of newness ☆

Johan Wiklund [a,b,*], Ted Baker [c,1], Dean Shepherd [d,2]

[a] Department of Entrepreneurship and Emerging Enterprises, Whitman School of Management, Suite 611, Syracuse University, Syracuse, NY 13244-2450, USA
[b] Jönköping International Business School, Sweden
[c] College of Management, North Carolina State University, Campus Box 7229, Raleigh, NC 27695-7229, USA
[d] Kelley School of Business, Indiana University, 1309 East Tenth Street, Bloomington, IN 47405-1701, USA

ARTICLE INFO

Article history:
Received 28 March 2008
Received in revised form 23 October 2008
Accepted 28 October 2008

Keywords:
Liabilities of newness
Financial indicators
Business failure

ABSTRACT

This paper builds on the liabilities of newness literature to suggest that accounting information is important for new firms. Using a sample of over 30,000 companies followed during their first 7 years of existence, we find evidence that financial indicators mitigate the liability of newness and that this buffering effect is stronger the younger the organization. These results represent three primary contributions to the literature. First, our conceptualization of accounting measures as indicators of external (creditworthiness enhancing legitimacy) as well as internal (targets for management) buffers to the liabilities of newness provides a novel way of viewing these constructs and explains why they are important to new firms despite their uncertainty and opacity. Second, we theoretically justify and empirically validate that these constructs are more important the younger the new firm is, which runs counter to the common wisdom of these constructs in the entrepreneurship literature. Third, we identify buffers against failure for new firms that are generalizable across industries.

1. Executive summary

A large body of entrepreneurship research argues that accounting information is largely irrelevant during the early years of an organization's life. As a consequence, we would expect that little attention should be paid to the accounting information of new ventures. However, this is not necessarily the case. In a little cited section of his seminal 1965 paper, Stinchcombe placed creditworthiness at the heart of the organizational stratification system shaping their legitimacy. Following this argument, we take the role of creditworthiness as a central element of organization-level legitimacy, but one that has been largely ignored in the literature. We identify relevant financial constructs indicating creditworthiness on the basis of bankruptcy prediction models. These models rely on accounting measures (i.e., ratios) that can be calculated from a firm's standard financial statements, using measures representing three fundamental financial management constructs – liquidity, leverage, and profitability – that appear to influence chances of failure. We treat financial constructs as indicators that reflect the presence of what we label "buffers," by which we mean firm characteristics that mitigate against firm failure, such as against the liability of newness. Buffers against the liability of newness are those buffers that are most effective when firms are newer and diminish with age. Firms shape – though they cannot fully determine – the presence of these buffers through early and ongoing strategic choices.

Specifically, we hypothesize that greater liquidity, greater profits and less leverage buffers against the liabilities of newness and that the buffering effect is stronger the younger the new venture. We test these hypotheses on a sample of over 30,000 companies

☆ This paper was accepted for publication before Dean A. Shepherd became editor-in-chief of the Journal of Business Venturing.

* Corresponding author. Jönköping International Business School, Sweden. Tel.: +1 315 443 3356; fax: +1 315 442 1449.
E-mail addresses: jwiklund@syr.edu (J. Wiklund), ted_baker@ncsu.edu (T. Baker), shepherd@indiana.edu (D. Shepherd).
[1] Tel.: +1 919 513 7943; fax: +1 919 515 6943.
[2] Tel.: +1 812 856 5220; fax: +1 812 855 4246.

0883-9026/$ – see front matter © 2008 Elsevier Inc. All rights reserved.
doi:10.1016/j.jbusvent.2008.10.011

followed during their first 7 years of existence, using discrete-time event history analysis. Our analyses find support for the basic liabilities of newness hypothesis — chances of failure are highest for new ventures during their first year of existence and then gradually diminish. In addition, our hypotheses for the buffering effect of financial constructs are supported. Consistent with Bankruptcy Prediction Models and substantial empirical evidence generated from mature firms, we find that higher liquidity, lower leverage, and higher profitability are all associated with higher probability of survival also in our sample of new ventures.

Despite a potential contribution of our study being the replication of existing studies with a sample of new firms, 7 years or younger, our primary contribution comes from linking these financial indicators to the unique challenges faced by new firms — the liabilities of newness. By conceptually relating the financial indicators of liquidity, leverage, and profitability to the liability of newness we were able to empirically demonstrate that the financial position of new ventures (captured by these indicators) serves to *buffer* the liabilities of newness. It is important to recall that we find strong support for the liabilities of newness hypothesis. Even at financial positions one standard deviation better than the mean, the odds of failure are high for newly founded firms (age 1 year) and the failure odds decrease steeply as they mature to the age of 7 years. Further, those firms showing a strong financial position (1 SD above the mean) exhibit higher odds of failure during their first years of existence than firms with average or low performance during their sixth or seventh years of existence. This applies to all three financial constructs examined. What our findings tell us is that when a firm is brand new, it stands a much better chance of surviving if it can rapidly convert assets to cash (liquidity) if it is profitable and if it does not rely on borrowed money (leverage). For a new venture that is able to survive a few years, these financial constructs play a smaller role for its survival. Therefore, it appears appropriate to view these financial constructs as buffers that can help overcome some of the liabilities of newness.

Our study joins a growing body of work that attempts to treat the liability of newness and similar long-studied phenomena not simply as patterned threats to survival or growth, but instead in terms of what levers may be available as actions for entrepreneurs to deal with and overcome these threats. Our paper contributes to this stream by showing how fundamental financial variables – which are also amenable to influence by the entrepreneur's early and ongoing strategic choices – shape a firm's experience with and chances of surviving the liability of newness.

2. Introduction

A large body of entrepreneurship research argues that accounting information is largely irrelevant during the early years of an organization's life. The argument proceeds along three principle lines: First, new firms' accounting figures are inherently uncertain and unreliable (e.g., Sine et al., 2006; Van de Ven et al., 1984). New firms have short performance histories and it takes time for routines and operations to stabilize and many new firms are highly volatile, operating for years before becoming profitable. Second, relative to entrepreneurs, external stakeholders are often at an information disadvantage about young firms because of a lack of formal or public records, and/or deficiencies in younger firms' formal control systems. This information asymmetry may be used opportunistically by entrepreneurs (Shane and Stuart, 2002), including biased reporting of actual financials. Third, the goals of entrepreneurs typically revolve around generating growth or personal satisfaction and not necessarily about generating profits (Wiklund et al., 2003). Therefore, the performance of new firms is not well reflected in traditional performance measures, such as profits or return on investment. In sum, scholars have noted that accounting information may not fairly reflect the performance and financial standing of new firms, which is the basic notion of accounting (Davidson et al., 1982). As a consequence, we would expect that little attention should be paid to the accounting information of new firms.

However, this is not necessarily the case. In a little cited section of his seminal 1965 paper (p. 171–173), Stinchcombe suggested that creditworthiness is an important element of the organizations' externally conferred reputations; as such it is likely to help shape firm level legitimacy. Following this argument, we examine the role of creditworthiness, i.e., a creditor's assessment of a company's ability to meet debt obligations, as a central element of organization-level legitimacy, but one that has been largely ignored in the organization theory literature. Empirical observations lend support to Stinchcombe's notion. Achieving ratings by credit firms is important for new firms (Almus and Nerlinger, 1999) and new firms typically achieve ratings at a very young age (Hyytinen and Pajarinen, 2007). These credit ratings are based on accounting information. Companies typically rely on credit rating information for new rather than established business relations in order to reduce risk, and trading with new firms inherently involves new business relations. According to this logic, absence of organizational history and information opacity should make accounting information of creditworthiness more, rather than less, important.

Therefore, this paper builds on the liabilities of newness literature to suggest that accounting information is important for new firms (despite its uncertainty and opacity), identifying reasons other than those traditionally mentioned in the new firm literature. Using a sample of over 30,000 companies followed during their first 7 years of existence, we find evidence that financial indicators mitigate the liability of newness and that this buffering effect is stronger the younger the organization. These results represent three primary contributions to the literature. First, research has established the presence of the liability of newness (Baum, 1996; Hannan and Freeman, 1984; Stinchcombe, 1965) and theorized on its external and internal dimensions (Aldrich and Auster, 1986; Hannan and Freeman, 1984). Our conceptualization of accounting measures as indicators of external (creditworthiness enhancing legitimacy) as well as internal (targets for management) buffers to the liabilities of newness provides a novel way of viewing these constructs and explains why they are important to new firms despite their uncertainty and opacity. Second, we theoretically justify and empirically validate that these constructs are more important the younger the new firm is, which runs counter to the common wisdom of these constructs in the entrepreneurship literature. Third, research has investigated survival at the firm level of analysis across cohorts within industries. We theorized on firm level variables believed to buffer firms against failure across industries and did so by following a cohort for its first 7 years of life. This captures generalizable buffers against failure for new firms and their changing impact as these new firms age.

The paper proceeds as follows: In the next section, we first present the liability of newness argument, followed by a linking of creditworthiness to the liability of newness. Next follows our hypotheses of how financial indicators affect new firm failure and buffer the liability of newness. The Methods section then presents our sample, measures and analysis strategy. We then present the study's findings. The paper ends with a discussion of the implication of the results and limitations of the study.

3. Financial indicators: external and internal buffers of the liability of newness

3.1. The liability of newness

Across a wide variety of industries, circumstances and time frames, younger organizations are more likely to close their doors and disband than older organizations (Baum, 1996; Hannan and Freeman, 1984; Stinchcombe, 1965). The term *liability of newness* is used to describe this propensity of younger organizations to have higher failure rates than their older counterparts (Baum, 1996: 79). Ecological and institutional scholars have conducted a great deal of research that empirically investigates the liability of newness (Aldrich and Ruef, 2006; Baum, 1996), providing strong evidence for the influences of newness on mortality. This evidence led Thornhill and Amit (2003: 505) to conclude: "From Stinchcombe's (1965) original statement of the concept through a wealth of population ecology refinements, there are few relationships in social science as well established as the negative correlation between age and mortality risk."

The ecological and institutional studies that dominated early research on mortality were concerned primarily with population level processes over which the behaviors of individual firms are likely to have little impact. Building on population-level evidence of these liabilities, however, scholars have identified opportunities that organizations may have to adopt behaviors and strategies as mitigating factors. For example, while investigating U.S. personal computer firms, Henderson (1999) found that technology strategy created important contingencies for the liability of newness. Likewise, a variety of studies have built upon the claims of institutional theorists, that ties to other organizations may aid survival (Aldrich and Auster, 1986; Baum, 1996; Dimaggio and Powell, 1991; Venkataraman and Van de Ven, 1998) and show that firms that create such linkages may counteract some effect of newness (e.g., Baum and Oliver, 1991).

These findings concur with Stinchcombe's initial conceptualization of the liability of newness. He pointed to both *internal* organizational hurdles and *external* challenges in terms of gaining legitimacy from external stakeholders and resource providers (Aldrich and Auster, 1986). Hannan and Freeman (1984) identify the predominantly internal control-oriented challenge of "reliability," and a predominantly external legitimacy-oriented challenge of "accountability".

Internal reasons for the liability of newness include the need to rely on "social relations among strangers" (Stinchcombe, 1965: 149) within the firm and a wide variety of organizational learning problems, such as the creation and learning of new roles and routines, which is costly. New organizations lack routines useful for making day-to-day operations controllable and predictable (Nelson and Winter, 1982) and engage in a variety of efforts to establish effective early routines (Gong et al., 2004). The lack of reliable routines and overall systems of efficient control may lead to wasteful and inefficient activity, during a period of very little resource slack (Baum, 1996; George, 2005).

External challenges associated with newness include the need to learn about the environment in which the firm is to do business, and establishing legitimacy in the eyes of resource providers, including employees, customer, suppliers, sources of finance, regulators and others (Stinchcombe, 1965: 149; Aldrich, 1999). Legitimacy is "a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions" (Suchman, 1995: 211). Ecological studies have demonstrated that for the average firm, legitimacy is heavily dependent on the legitimacy of the population of firms in which it is a member and with which it shares a common form (Freeman et al., 1983). Therefore, for most new organizations, which are replications of existing forms, overall population-level legitimacy is not a serious issue. Even some very new industries appear to gain broad "sociopolitical" legitimacy quite rapidly, while individual firms struggle to gain "cognitive" legitimacy — and to be taken for granted by various constituencies (Aldrich and Baker, 2001; Delacroix and Rao, 1994). For these new firms, the important issue is gaining legitimacy relative to the firms with which it competes (Choi and Shepherd, 2005).

The idea of liability of newness has been qualified by the introduction of the terms "liability of adolescence" (Brüderl and Schüssler, 1990) or the "honeymoon period" (Fichman and Levinthal, 1991), which suggests that there is an initial period of low failure rates because new firms can survive on initial resource endowments and enthusiasm. However, after this waiting period, failure rates reach high levels and then gradually decrease (Strotmann, 2007). As noted by Brüderl and Schüssler (1990), the waiting period should be a few months only and with yearly measured data, a continuous-decline model will be appropriate. To provide a baseline for investigating the buffering effect of the creditworthiness of new firms, we offer the basic liability of newness hypothesis related to external as well as internal liabilities:

Hypothesis 1. *Age has a negative effect on the probability of new firm failure.*

3.2. Creditworthiness and liability of newness

Stinchcombe (1965: 171–173) pointed the importance of creditworthiness in determining the reputation of organizations, suggesting that good creditworthiness – which is conferred by outside actors – may be one important factor in shaping the legitimacy of an organization. Empirically, Brüderl and Schüssler (1990) found their proxy for creditworthiness (legal form) to be a

major predictor of survival. With particular relevance to small young firms, industrial organization economists have theorized that small firms often face scale disadvantage but that the growth which might help them to gain efficiencies and survive is more difficult for them to achieve for a variety of reasons which include difficulties in accessing financial markets (Strotmann, 2007); a problem which may be exacerbated by issues of creditworthiness. Honjo (2000) found that larger size and higher capitalization aided survival in a study of almost 2500 manufacturing firms founded in Tokyo between 1986–1994. Similarly, in Fotopoulos and Louri's study of 219 young Greek manufacturing firms, measurements of high initial capital and low debt load are among the factors that increase the chances that firms survive over an eight to ten year window. As we will review later in the paper, the substantial literature on bankruptcy prediction models is in accord with these economic analyses and is in many ways a direct application and extension of industrial organization economics insights. As is also well recognized in organizations and strategy literatures, a firm's accounting statements represent a valuable – if imperfect – measure of its market performance and also an indicator of how it is viewed by financial stakeholders (Park, 2003; Powell and Lloyd, 2005).

But the same accounting measures that signal creditworthiness are also central to the internal aspects of the liabilities of newness. A major challenge for new firms, and an important internal liability of newness, is the development of reliable routines and overall systems of efficient control, which otherwise may lead to wasteful and inefficient activity, during what is typically a period of very little resource slack (Baum, 1996; George, 2005). It has long been recognized that management of an organization can be improved by the identification, measurement, and management of the key indicators of accounting systems (cf. e.g., International Federation of Accountants; Institute of Management Accountants).

Accounting systems capture the results of firm behavior and performance in a manner that reflects both management decisions and the environment in which a firm competes. Financial constructs measured with accounting ratios are used both as internal tools and targets for managerial strategy and control, and as a legitimated form of communicating information about the firm's standing to external parties (Brealey and Myers, 1996; Davidson, Stickney, and Weil, 1982). Financial statements reflect the operation of internally and externally-oriented firm strategies as well as overall performance, while providing information useful for perspectives concerned with both external accountability and legitimacy issues and internal managerial and reliability issues.

Creditworthiness is highly institutionalized in several different senses of the term (Hirsch and Lounsbury, 1997; Stinchcombe, 1997). First, notions of credit and creditworthiness are part of the normative fabric of modern capitalist nations (Guseva and Rona-Tas, 2001; Kerwer, 2005). Second, evaluations of creditworthiness are supported by a highly institutionalized group of rating organizations. These include organizations that are very general in scope, such as Dun and Bradstreet and those such as Moody's and A.M. Best that target specific industries. These organizations routinely provide the sorts of third-party certification (Rao, 1994) that often plays a central role in determining relative ranking in organizational stratification regimes. Such third party certifying organizations are joined by many thousands of internal firm credit departments that make their own evaluations, sometimes using third party information as inputs. Third, even more broadly, evaluations of creditworthiness rely heavily on the provision of standardized financial measures, which are created and sometimes audited by professional accountants following standardized rules and procedures governed by powerful institutions (Han, 1994).

Evaluations of creditworthiness underlie a wide variety of business relationships. Employees or recruits may wonder whether a struggling organization can be counted upon to 'make payroll,' provide raises or to reimburse expenses paid out of pocket. Suppliers evaluate customers – formally or informally – in regard to how much trade credit should be extended and on what terms (Foster, 1978). Customers may also consider the creditworthiness of suppliers and sometimes have reason to regret decisions to make any payments before a product or service has been fully delivered (Davila et al., 2005). Most obviously, providers of both debt and equity are concerned with the ability of a firm to make good on its debts (Miller and Modigliani, 1961).

The examination of creditworthiness has a long history in the economics, finance and accounting literatures (Hillegeist et al., 2004). Economists have been particularly interested in understanding the dynamics of firm survival (e.g., Fotopoulos and Louri, 2000; Honjo, 2000; Strotmann, 2007) and also in understanding how capital markets price the risks and costs of "financial distress" and bankruptcy (Franks and Tourous, 1994; Warner, 1977) and especially how these risks are shaped by firms' financial structure. Several important contributions have been made relating bankruptcy to internal-to-the-firm factors, such as control systems (Jensen, 1993) or capital structure (Franks and Sussman, 2005) as well as external conditions such as industry concentration (Opler and Titman, 1994) or market demand (Maksimovic and Phillips, 1998). Complementing this work, scholars have developed an important group of models that attempts to predict bankruptcy and the financial distress that often precedes bankruptcy (Shin and Lee, 2002). In this paper, we build on bankruptcy prediction models (BPMs) of creditworthiness that rely on accounting measures (i.e., ratios) calculated from a firm's standard financial statements to predict bankruptcy.

Most of the older and still commonly used BPMs (Altman, 1968; Ohlson, 1980; Zmijewski, 1984), but also more recent approaches (Atiya, 2001; Beaver et al., 2005; Chava and Jarrow, 2004; Hillegeist et al., 2004; Shumway, 2001), have in common the use of measures representing three fundamental financial management constructs – liquidity, leverage, and profitability – that appear to influence chances of failure. Even when formal multivariate statistical models are not applied, the simple accounting measures on which they rely are common inputs to more informal evaluations of organizational creditworthiness.

We treat financial constructs as indicators that reflect the presence of what we label "buffers," by which we mean firm characteristics that mitigate against firm failure, such as against the liability of newness. Buffers against the liability of newness are those buffers that are most effective when firms are newer and diminish with age. Firms shape – though they cannot fully determine – the presence of these buffers through early and ongoing strategic choices. We now develop a series of hypotheses on the same set of three core financial constructs: leverage, liquidity and profitability.

3.3. Liquidity and liabilities of newness

Liquidity is the ability of a firm to meet its short-term financial obligations when and as they fall due (Foster, 1978: 28). Models of creditworthiness generally place a positive weight on a firm's measured liquidity (Allen and Cote, 2005; Collins, 1980; Lemke, 1970). Low liquidity may indicate that a firm is strapped for working capital, an upcoming need to "stretch" payables and higher risk for defaulting on some payments. For example, loan officers of banks assess the borrower's vulnerability to adverse external events that might reduce the firm's ability to service the debt (Beaulieu, 1994). That vulnerability is assessed by resource providers in terms of the firm's liquidity — the higher the liquidity the more confident resource providers are that the loan will be serviced even if future performance does not meet expectations (Altman, 1983; Beaulieu, 1994, 1996; Sinkey, 1992). Therefore, high liquidity signals the firm's ability to meet commitments despite unanticipated negative shocks that could have otherwise threatened the firm's survival. High liquidity can signal legitimacy to potential investors, suppliers and customers (Hambrick and D'Aveni, 1988).

From a management perspective, high levels of liquidity provide insurance against problems engendered by unstable revenue flows or unforeseen costs. Such liquidity can provide short term slack permitting managers to overcome what might otherwise be serious problems for a firm (George, 2005).

Liquidity can also serve as a buffer to the liabilities of newness. Liquidity provides "comfort" to (potential) external stakeholders encouraging their investments. This "comfort" from higher liquidity is greatest when the ability of external constituents to assess the firm's future performance is the most uncertain. For example, risk estimation by external constituents is often difficult given the presence of information asymmetry between it and the new firm (Ang, 1991; Binks et al., 1992; Pettit and Singer, 1985). This information asymmetry is greater for newer firms than more established firms because established firms have a "track record", which informs the assessments of external constituents. Therefore, external constituents value liquidity more (and subsequently provide the firm its support) when dealing with new firms but value it less as the firm ages when they can make more informed assessments of the firm's current and future performance.

New firms face environmental uncertainty that they are unable to control (Aldrich, 1979). Exacerbating this, the greater the extent that basic firm tasks and processes are unstable and unreliable (Anthony and Govindarajan, 2004; Grant and Leavenworth, 1996), the greater the firm's need to invest in slack resources in the form of excess liquidity to buffer unpredictable ups and down. For example, a firm with routinized capabilities in billing, collections and cash management can generally maintain lower levels of liquidity (Barrett, 1993; Pacini and Tucker, 2002) than a firm without such capabilities. It takes time for new firms to develop stable operations and administrative systems. Therefore, their need for liquidity is likely to be greater at the very early stages of development. As the new firm ages, it should be able to develop the necessary routinized capabilities in financial management. Thus:

Hypothesis 2. (a) Higher liquidity reduces the likelihood of new firm failure. (b) High liquidity reduces the probability of failure more the younger the new firm is.

3.4. Leverage and liabilities of newness

Leverage refers to the extent to which nonequity capital is used in a firm and to the long run ability of the firm to meet payments to nonequity suppliers of capital (Foster, 1978: 31). High leverage is sometimes associated with organizational decline (Wiseman and Bromiley, 1996) and BPMs generally place a negative value on a firm's measured leverage (Beneish and Press, 1993). External constituents (investors, lenders, potential employees) must assess the financial risk of what they would suffer if the firm to which they committed failed (Foster et al., 1998). Higher levels of debt represent prior claims on future cash flows and sometimes also suggest a reduced ability for the firm to generate new, reasonably priced debt (Panno, 2003). Unpaid debtholders can force firms into bankruptcy, and high levels of debt therefore suggest higher levels of risk. Low leverage indicates to external constituents that less cash flow is tied to required, regular payments that could threaten survival if leverage was high (Beaulieu, 1996). That is, to external constituents considering committing their resources to a new firm, low leverage indicates a possible "cushion" should the firm does not perform to expectations. For example, low leverage means that the firm's assets are less encumbered and represent an alternate source of payment for the bank if the borrower defaults on the loan (Ruth, 1987).

For other external constituents, low leverage indicates a possible source of future funds (from additional debt capital) to continue to operate the business if firm performance does not meet expectations. This "buffer" for debt is more influential on external constituents' decision of whether or not to commit when there is greater risk in assessing firm performance. Due to uncertainty (Nelson and Winter, 1982) and information asymmetry (Ang, 1991; Binks et al., 1992; Pettit and Singer, 1985) being higher for firms when they are new and reducing as they age, we offer the following:

Hypothesis 3. (a) Lower leverage reduces the likelihood of new firm failure. (b) Low leverage reduces the probability of failure more the younger the new firm.

3.5. Profitability and liabilities of newness

Profitability is the ability of a firm to generate revenues in excess of expenses (Foster, 1978: 33). In general, profitability is viewed as contributing to creditworthiness (Sargent and Young, 1991; Scherr et al., 1993). However, the entrepreneurship

literature suggests that because new firms may have a legitimate need to invest heavily in building market share and capabilities (Shepherd and Shanley, 1998) their legitimacy may depend less on demonstrating profitability than is the case for older firms. Despite this and consistent with the general positive interpretations of profits, we argue that profits should enhance the probability of survival.

Profitability acts as an internal buffer against failure because it reflects a reliable process. This is particularly important in the early stages of a new firm where to bootstrap the firm the entrepreneur needs to "get operational quickly", "look for quick break-even, cash-generating projects" and "keep growth in check" (Bhide, 1992: 113). After profitably exploiting this first opportunity the firm will be in a better position to discover and pursue subsequent opportunities that may take longer to achieve operational efficiency and may require an extended period of growth before achieving break-even. Once the firm has established a reliable process to efficiently exploit its first opportunity then it is in a position to build upon this reliable process to pursue subsequent "less marginal" opportunities that will take longer before becoming profitable (Bhide, 1992). Thus:

Hypothesis 4. (a) Higher profitability reduces the likelihood of new firm failure. (b) High profitability reduces the probability of failure more the younger the new firm.

4. Methods

4.1. Population/sample

Stinchcombe (1965) suggested that *liability of newness* was a very general phenomenon, although he noted that it was likely exacerbated in new industries and in environments lacking particular resources and infrastructure. Many prior studies, especially those from ecological and institutional perspective, have focused on *liability of newness* as an element within the context of investigating the dynamics of individual organizational populations, and have thus followed a single population from its inception. Our interest in this study was in studying the *liability of newness* as an extremely general phenomenon across all industries, in order to identify general characteristics of potential mitigating strategies. Our focus is on firm-level characteristic and outcomes, rather than on industry dynamics. We therefore include in our sample all independent incorporated companies (i.e., we excluded subsidiaries of existing firms) first registered in Sweden in the 1994 to 1996 period. The incorporation of a company in Sweden requires a minimum share capital of 100,000 SEK (approximately 12,500 USD). As noted by Singh et al. (1986), incorporating a company signals a strong commitment by founders to build and maintain an ongoing organization. By law, incorporated companies must register with the Swedish patent office before commencing operations, and must file annual reports (which are certified by a chartered accountant). All data for this study were taken from these annual reports. Removing shelf companies – companies that never registered any economic activities – our sample includes the 37,782 independent companies that incorporated during these 3 years. We followed these firms annually for 7 years or until they failed.

Bankruptcies and liquidations are automatically reported from the Swedish courts to the patent office. Companies can also apply to the patent office to be closed. On a bi-weekly basis, the latest updates on closure for all companies are reported from the patent office to the database that we utilized. We gathered this data through January 2004.

4.2. Variables and measures

4.2.1. Dependent variable

Firm Failure: We combined three indicators of closure in order to create this variable: (1) Completed bankruptcies, with or without a surplus, (2) completed liquidations, and (3) closures on the basis of companies' own request. The variable was coded 1 for companies if they had closed and 0 otherwise. Consistent with Fischer and Pollock (2004), we did not consider mergers as closures because operations continue within another organizational context. Further, mergers are not necessarily associated with poor performance. Firms were kept in the sample until the year of the merger.

4.2.2. Independent variables financial constructs

We followed the lead of Beaver's et al. (2005) bankruptcy prediction model in selecting, defining and measuring our financial constructs. Specifically, three variables and their operationalizations were taken from the Y-score model of bankruptcy prediction (Ohlson, 1980) because Beaver's et al. (2005) subsequent validation showed that these three variables capture essentially the explanatory power of the financial statement variables used in the full models of Ohlson (1980), Shumway (2001) and Zmijewski (1984). Liquidity was operationalized as working capital divided by total assets. We operationalized leverage as total liabilities divided by total assets and profitability as net income divided by total assets. Consistent with the literature, these variables were lagged 1 year relative to the dependent variable (e.g., Shumway, 2001) and the information was taken from their annual statements. Most previous bankruptcy prediction studies have not controlled for differences in bankruptcies across industries (Chava and Jarrow, 2004) despite the fact that demand conditions and concentration vary across industries and that these variables affect the probability of financial distress and bankruptcy (Opler and Titman, 1994). In order to account for such potential industry differences, for each financial indicator, we took the firm's individual score and subtracted the industry mean using the industry definitions presented below.

4.2.3. Independent variable age

Firm age was computed as the current year minus the year in which the firm was registered. In Sweden, formal registration of a firm is legally required before commencing trading.[3]

4.2.4. Control variables

To complement the financial constructs of the bankruptcy prediction model, we included *Cash* as a measure of financial slack. Financial slack – particularly cash – is often viewed as central to new firm survival (e.g., Shepherd et al., 2000) and there is a substantial literature showing that the access to financial slack has performance implications (e.g., George, 2005). As for the other financial indicators, this information was taken from the annual statement in the year prior to measuring the dependent variable.

We also controlled for *Industry* by using the standard one-digit ISIC sectors, but combined agriculture and fishery into one sector. Thus, the sectors included were: agriculture and fishery; mining; manufacturing; electricity, gas, heating, and water (utilities); construction; retail and wholesale; hospitality; transportation and communication; finance; real estate; education; healthcare; other public and personal services; and other. We created the sector "other" because 16.8% of the sample lacked industry classification. Dummy variables were created for all sectors except the largest "other services" sector, as suggested in the literature (Hair et al., 1998).

Many bankruptcy prediction models control for *Firm Size*, typically using market capitalization as the indicator. Because the new firms in our sample are not stock listed, we instead controlled for size using the firms' total sales.

4.3. Statistical model and analyses

Bankruptcy Prediction Models have traditionally relied on single period ('static') discriminant analysis (e.g., Altman, 1968, see also Altman and Saunders, 1998, for a review of models used). However, such models ignore the fact that firms change over time, thereby producing bankruptcy probabilities that are biased and inconsistent (Shumway, 2001). Shumway (2001) suggested the use of dynamic panel data analysis, so called event history analysis. There are four principle advantages of such an analysis. First, static models fail to account for a firm's period at risk of bankruptcy. Some firms fail early, others late, whereas some firm never fail. Event history models automatically account for period at risk of failure. Second, event history models allow the inclusion of explanatory variables that change over time from one period to the next, i.e., the inclusion of time-varying covariates. The user of a static model has to arbitrarily choose variable values of particular years. Third, firms that leave the sample for reasons other than bankruptcy (e.g., because of a merger) are considered as censored in their last year of observation. A static model has to either consider such an observation as a bankruptcy or a surviving firm. Fourth, event history analysis makes full use of available data by treating each year a firm exists as a separate observation. This leads to more precise parameter estimates.

Empirically, comparisons of static and event history bankruptcy prediction models show that the latter perform better and are generally superior to static models (Chava and Jarrow, 2004; Shumway, 2001). Importantly, the liabilities of newness literature have traditionally relied on similar analyses (e.g., Fichman and Levinthal, 1991; Fischer and Pollock, 2004; Freeman et al., 1983; Singh et al., 1986). Thus, the two major strands of literature in which we build converge on using this type of analysis.

There are several types of event history models. Because we rely on yearly observations, and events leading to our observed measures may occur any time during the year we use discrete-time logit analysis. This is consistent with prior bankruptcy prediction studies using similar data (Beaver et al., 2005; Chava and Jarrow, 2004; Shumway, 2001) as well as liabilities of newness studies using annual data (Palmer et al., 1993; Fischer and Pollock, 2004). A general form of the discrete-time logit analysis we use here is:

$$\mathrm{Ln}\left[h_j(t)/\left(1-h_j(t)\right)\right] = a(t) + B\mathbf{X}_j(t) \tag{1}$$

In this model, $h_j(t)$ represents the hazard (risk of bankruptcy) at time t for firm j conditional on survival to time t; $a(t)$ is the baseline hazard (intercept); $\boldsymbol{B}$ is a vector of coefficients and $\mathbf{X}_j(t)$ is a matrix of financial ratios and control variables that may vary over time. The hazard rate is distributed logistically and is the odds ratio in favor of bankruptcy. The model is estimated using maximum likelihood estimation, providing consistent estimates of the coefficients in $\boldsymbol{B}$.

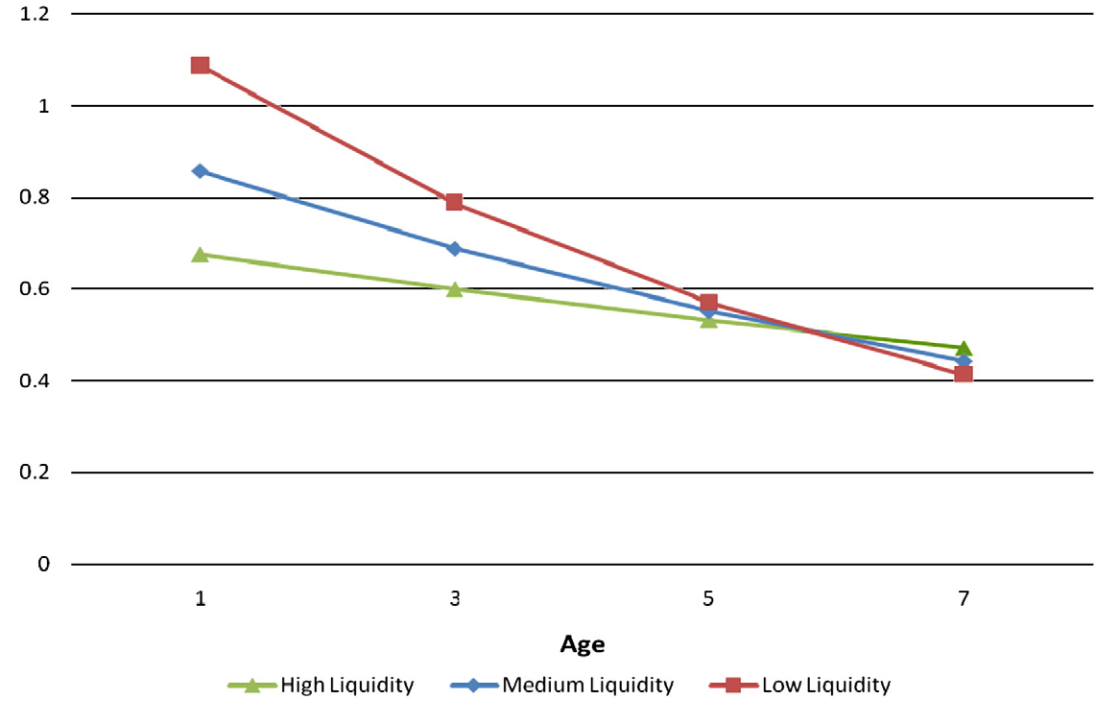
In order to test our hypotheses suggesting that financial constructs buffer the liabilities of newness, we constructed interaction variables by multiplying firm age with our variables measuring liquidity, leverage and profitability respectively. This gives us a total of three interaction terms in addition to the direct effects. We first start with a base model estimating the direct effects of the variables. We then enter each of the interactions separately. We present the results of the analysis in Table 2 and the plots in Fig. 1A–C.

5. Results

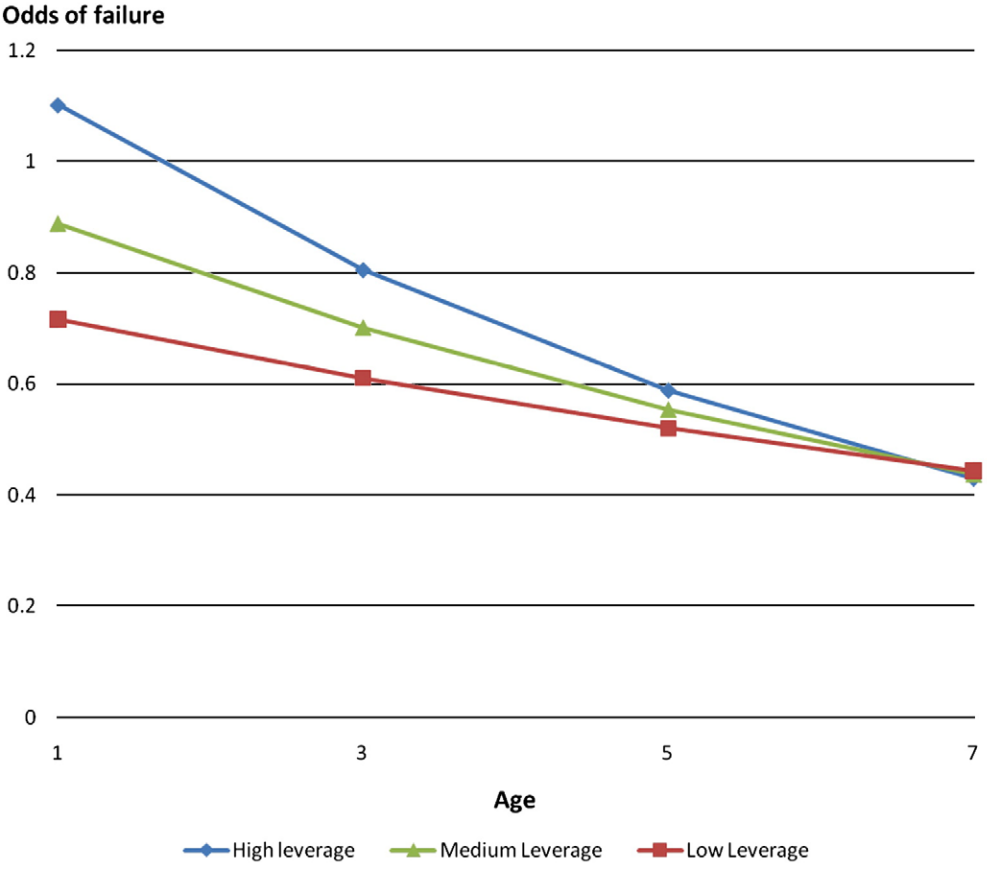
Descriptive statistics and correlations for the continuous variables are provided in Table 1. Correlations among the three financial constructs are positive. However, the magnitude is moderate, with the highest correlation being 0.27 between leverage

[3] It is possible that firms start trading under a different legal form and change to incorporation in the year we register. This is something we cannot control for.

A


Odds of failure
1.2
1
0.8
0.6
0.4
0.2
0
1
3
5
7
Age
High Liquidity
Medium Liquidity
Low Liquidity

B


Odds of failure
1.2
1
0.8
0.6
0.4
0.2
0
1
3
5
7
Age
High leverage
Medium Leverage
Low Leverage

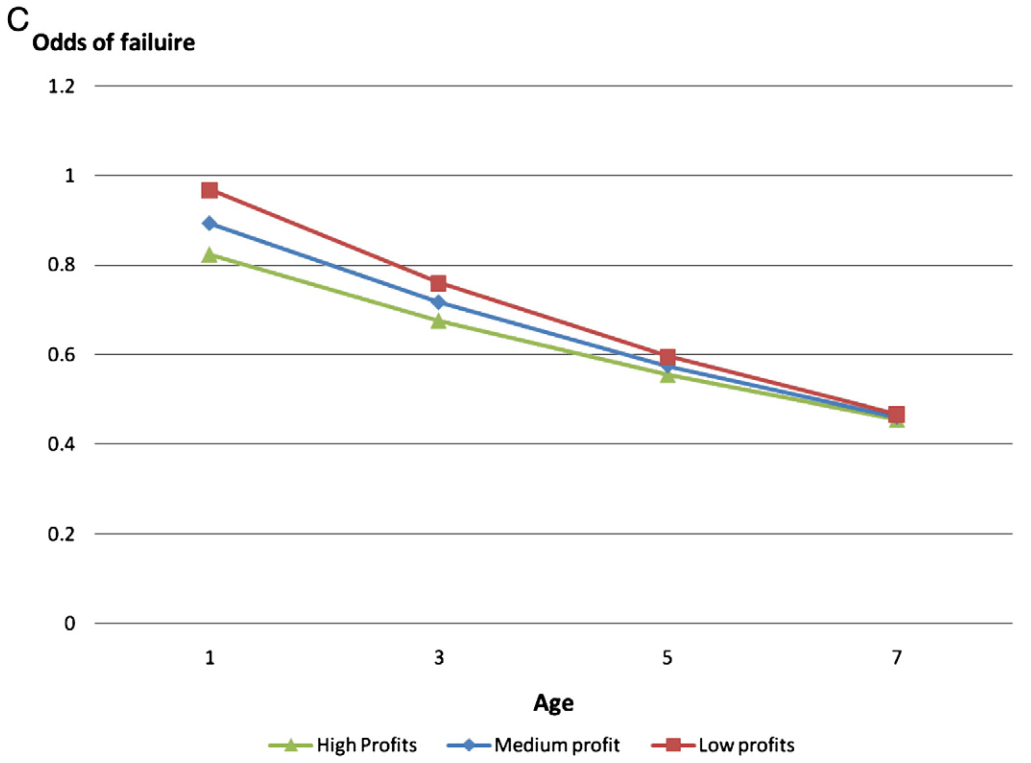


Fig 1. (A) Liquidity moderating the relationship between firm age and odds of failure. (B) Leverage moderating the relationship between firm age and odds of failure. (C) Profitability moderating the relationship between firm age and odds of failure.

and liquidity. Thus, the risk of multicollinearity should be minimal. As a robustness test, we ran the models entering the three financial indicators separately instead of jointly. Results were qualitatively identical, indicating that multicollinearity was not an issue.

We now turn to the discrete time logit analyses presented in Table 2. Almost one third of the sample (13,063 out of 37,782 firms) failed during the study's time frame, suggesting that failure is a common phenomenon in this population. Starting with the base model presented in column 2 (regression coefficients) and column 3 (standard errors) of the table, we note that the Log Likelihood and Chi^2 statistics suggest that the overall model is statistically significant. This result is not surprising given the large number of observations and thus statistical power. The negative effects of all industry controls suggest that firm failure is highest in the unclassified "other" category ($p<0.001$). A possible explanation is that some firms failed too early to receive an industry classification and thus end up in this category. The positive coefficients for the cohort variables ($p<0.01$) indicate that firms started in 1996 have the lowest odds of failure. This is an interesting finding because 1996 was a year of slow economic growth in Sweden whereas growth was high in 1994 and 1995.

It appears that, in our sample, firms started under harsh economic conditions fared better than those that began in more favorable environments. Prior discussions about the "imprinting" of founding conditions on the future performance of organizations have suggested that firms "born" during harsh conditions might be expected to do better because they have to survive a difficult early selection environment and/or learned how to survive, or that, alternatively, such firms might be permanently disadvantaged by the penurious environments in which they began (Aldrich, 1999; Hannan and Carroll, 1992). At first glance, it appears that our data support the first argument, that firms born in tough environments are more likely to be "survivors." However, a variety of recent longitudinal studies of the "birth" of new firms (e.g., Gartner, 2004) suggest that gestational processes can be quite long. This raises interesting questions for future research about the role of relative environmental munificence during the pre-launch of a new firm versus conditions of the environment post start-up. Unfortunately, our data do not allow us to investigate these questions as part of the current study.

Consistent with the liability of newness hypothesis, the coefficient for age is significant and negative ($p<0.001$) indicating that as age increases the odds of firm failure decrease. This provides support for H1 stating that age has a negative effect on the probability of new firm failure.

The direct effects of the financial variables were also significant ($p<0.001$). Higher liquidity, lower leverage, and higher profitability are associated with lower odds of failure. These findings provide support for hypotheses 2a, 3a, and 4a, respectively. Turning to the tests of how financial constructs buffer the liabilities of newness, model 1 (columns 4 and 5) adds the interaction term for liquidity and age, model 2 (columns 6 and 7) adds the interaction term for leverage and age, model 3 (columns 8 and 9) adds the interaction term for profitability and age. As the difference in Chi^2 statistics indicates, each interaction makes a statistically

Table 1
Descriptive statistics and correlations.

Variable	Mean	S.D.	1	2	3	4	5	6
Profit	0.06	2.34	1.00					
Leverage	−0.27	1.31	0.21	1.00				
Liquidity	0.15	0.98	0.12	0.27	1.00			
Cash	722.30	36486.51	0.00	0.00	0.00	1.00		
Age	4.56	2.30	0.00	−0.01	0.01	0.01	1.00	
Size	0.03	54.40	0.00	0.00	0.00	0.05	0.04	1.00

Note: Means are close to zero for the financial indicators and size because these variables are centered at industry mean. $n = 287,871$.

significant improvement of overall model fit. The estimate for the interaction between liquidity and age is significant and positive (0.025; $p<0.001$), the interaction between leverage and age is significant and negative (−0.019; $p<0.001$), and the interaction between profitability and age is significant and positive (0.004; $p<0.001$).

To interpret our results, we plotted each interaction to determine the nature of these contingent relationships (consistent with Aiken and West, 1991). To make the plots directly interpretable we then exponentiated this expression to estimate the odds of firm failure (Aldrich and Nelson, 1984). We estimated the function at the mean and 1 standard deviation above and below the mean for the financial constructs and a range of values for age and size (Aiken and West, 1991).

H2b theorized that high liquidity buffers the firm against failure but *more* so the younger the new firm is. Fig. 1A plots the interaction of liquidity and age. All lines slope downwards, suggesting that the odds of firm failure decrease as firms age. For young firms, there is a substantial gap between the lines, and this gap decreases with increases in age. At age one, the odds of firm failure are 41% lower for firms with high liquidity (one standard deviation above the mean) than those with low liquidity (one standard deviation below the mean). At age seven, odds are similar, with 3% higher odds of failure among firms with high liquidity. The nature of this relationship supports H2b that liquidity buffers the probability of failure more the younger the new firm.

H3b stated that low leverage buffers the firm against failure but *more* so the younger the new firm is. In Fig. 1B the lines slope downwards, suggesting that the odds of firm failure decrease as firms age. There is a substantial gap between the lines when firms

Table 2
Results of discrete time logit analysis for new venture failure.

Variable	Base model		Model 1		Model 2		Model 3	
	Estimate	S. E.	Estimate	S. E.	Estimate	S. E.	Estimate	S. E.
Constant	−1.78	0.03	−1.78	0.13	−1.74	0.03	−1.73	0.03
High-tech manufacturing	−1.53	0.13	−1.53	0.13	−1.53	0.13	−1.53	0.13
Wood, pulp and paper	−1.31	0.11	−1.30	0.11	−1.31	0.11	−1.31	0.11
Manufacturing industry	−1.57	0.07	−1.57	0.07	−1.57	0.07	−1.59	0.07
Mine and steel	−1.67	0.22	−1.67	0.22	−1.68	0.22	−1.68	0.22
Other manufacturing	−1.34	0.07	−1.34	0.07	−1.36	0.07	−1.36	0.07
Technology services	−1.60	0.05	−1.60	0.05	−1.61	0.05	−1.61	0.05
Other know.-intensive serv.	−1.63	0.04	−1.63	0.04	−1.65	0.04	−1.65	0.04
Financial services	−1.52	0.05	−1.52	0.05	−1.53	0.05	−1.53	0.05
Construction	−1.33	0.05	−1.33	0.05	−1.34	0.05	−1.35	0.05
Retail and wholesale	−1.09	0.03	−1.09	0.03	−1.10	0.03	−1.11	0.03
Hospitality	−0.86	0.05	−0.87	0.05	−0.87	0.05	−0.88	0.05
Communications	−1.37	0.06	−1.37	0.06	−1.38	0.06	−1.39	0.06
Education	−1.55	0.07	−1.55	0.07	−1.57	0.07	−1.58	0.07
Other services	−1.14	0.06	−1.14	0.06	−1.16	0.06	−1.16	0.06
Land. forestry and fishery	−1.76	0.10	−1.76	0.10	−1.78	0.10	−1.78	0.10
Public sector	−2.40	0.28	−2.40	0.28	−2.42	0.28	−2.42	0.28
Research	−1.75	0.21	−1.75	0.21	−1.76	0.21	−1.77	0.21
Health-care	−1.94	0.09	−1.94	0.09	−1.96	0.09	−1.97	0.09
Age	−0.11	0.00	−0.11	0.00	−0.11	0.00	−0.11	0.00
Size	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Start94 (cohort)	0.26	0.03	0.26	0.03	0.25	0.03	0.25	0.03
Start95 (cohort)	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03
Cash	−0.26	0.02	−0.26	0.02	−0.26	0.02	−0.26	0.02
Liquidity	−0.03	0.01	−0.03	0.01	−0.04	0.01	−0.28	0.02
Leverage	0.06	0.01	0.05	0.01	0.19	0.01	0.06	0.01
Profitability	−0.01	0.00	−0.04	0.01	−0.01	0.00	−0.01	0.00
Liquidity × age			0.05	0.00				
Leverage × age					−0.03	0.00		
Profitability × age							0.01	0.00
Log likelihood	44617		44607		44541		44514	
Chi^2	6378		6441		6399		6395	
Chi^2 change			62		21		17	

Note: All regression coefficients, all model fit indices as well as the Chi^2 change measures are statistically significant at $p<0.001$. There are 45,041 new ventures providing 267,555 observations.

are 1 year old, but the gap diminishes as they age. At age 1, the odds of failure are 38% higher for firms with high leverage (one standard deviation above the mean), whereas the difference in only 1% at age 7. These findings support H3b that low leverage buffers the probability of failure more the younger the new firm.

H4b theorized that high profitability buffers the firm against failure and *more* so the younger the new firm is. Fig. 1C contains the interaction of profitability and age. For young firms there is a substantial gap between the lines, and this gap decreases with increases in age. Numerically, the odds of firm failure at age one are 14% lower for firms with high profitability (one standard deviation above the mean) than those with low profitability (one standard deviation below the mean). At age seven, the difference has diminished to 1%. These findings provide support for our H4b that high profitability buffers the firms against failure more the younger the new firm.

6. Discussion

Financial indicators are often disparaged when applied to new firms. It is believed that these indicators are attempting to capture systems and processes that are yet to be fully formed, are highly variable and uncertain and, as a result, are typically discounted or ignored by external constituents in assessing the firm's creditworthiness. We find that when it comes to failure these financial indicators do have explanatory ability. Indeed, consistent with Bankruptcy Prediction Models and substantial empirical evidence generated from mature firms, we find that higher liquidity, lower leverage, and higher profitability are all associated with higher probability of survival in our sample of new firms.

Our primary contribution comes from linking straightforward financial indicators to the unique challenges faced by new firms — the liabilities of newness. By conceptually relating the financial indicators of liquidity, leverage, and profitability to the liability of newness we were able to empirically demonstrate that the financial position of new firms (captured by these indicators) serve to *buffer* the liabilities of newness. It is important to recall that we find strong support for the liabilities of newness hypothesis. As our plots indicated, even at financial positions one standard deviation better than the mean, the odds of failure are high for newly founded firms (age 1 year) and the failure odds decrease steeply as they mature to the age of 7 years. Further, those firms showing a strong financial position (1 SD above the mean) exhibit higher odds of failure during their first year of existence than those firms with average or low performance in their sixth or seventh year of existence. This applies to all three financial constructs examined. What our findings tell us is that when a firm is brand new, it stands a much better chance of surviving if it can rapidly convert assets to cash (liquidity), if it is profitable and if it does not rely on borrowed money (leverage). For a new firm that is able to survive a few years, these financial issues play a smaller role for its survival. Therefore, it appears appropriate to view these financial constructs as buffers that can help overcome some of the liabilities of newness.

In our model, financial constructs have a greater impact on the odds of failure when firms are younger than when they are older. That is, rather than being less relevant for younger firms, as sometimes assumed, we theorized and found that these financial indicators are more discriminatory in explaining the odds of failure for newer firms and become less so as these firms age. It appears that these financial indicators buffer firms' vulnerabilities to the liability of newness. As the liability of newness dissipates as firms age so does the buffering effect of these indicators. Financial indicators reflect and support the legitimacy of a new organization and provide internal control targets for managers. As firms age and achieve an operating history, other aspects of the business are likely to play an increasing role in its legitimacy (e.g., a history of trustworthiness, product performance and behavior in accordance with regulations and rules); their procedures and operations become increasingly routinized and new challenges develop. Overall, the internal and external issues associated with newness give way to new sets of challenges. We now discuss the implications of our findings in more detail.

6.1. Liquidity as a buffer against the liability of newness

We found that liquidity mitigated the odds of failure and more so when the firms were younger and less so as they aged. There is a debate in the financial slack literature on whether greater financial slack encourages experimentation necessary for new products, processes, etc. and a cushion against external shocks (Cyert and March, 1963; Pfeffer and Salancik, 1978) or encourage organizational lethargy in terms of diminished willingness to accept risk (Miller and Leiblein, 1996), increased inefficiency (Leibenstein, 1969), and the acceptance of strategic or structural mismatches with the environment (Litschert and Bonham, 1978). Some have reconciled these two perspectives by demonstrating a curvilinear relationship (inverted U) between slack and performance (George, 2005; Nohria and Gulati, 1996). We complement these studies with their focus on established firms (George, 2005), with a focus on survival and a cohort of new firms and follow them as they age (or die). Our findings that liquidity buffered the liabilities of newness suggest that the potentially negative effects of slack such as organizational lethargy structural mismatch are unlikely to pose problems when firms are very young. The decreasing benefits of slack as organizations mature indicate that these mechanisms may come into play as organizations mature and the liabilities of newness become less of an issue.

6.2. Leverage as a buffer against the liability of newness?

Our findings for leverage were also in line with our hypotheses. It is likely that claims to future cash flows, as indicated by greater leverage, are particularly difficult for brand new firms to service. Stated differently, there is little support in our data for the "discipline of debt" argument. For example, Jensen (1986) suggested that debt (and the pressure of servicing debt) motivates managers to perform at a greater level of efficiency and dissuades management from experimenting with, creating, and exploiting

opportunities. While such a disciplining role of debt may have positive implications for more mature firms, the opposite appears to hold among new ventures.

6.3. Profitability as a buffer against the liability of newness

Our results indicated that high profitability operates as a buffer against the liabilities of newness. As the odds of failure decreased the more profitable the new firms became, but the effect gradually dissipated as the new firms became more mature. Among the three constructs that we examined, profitability has the strongest signaling effect to external constituents about the viability of new firms. Similarly, it provides the most obvious target for managers, providing evidence of whether the new firm is pursuing an appropriate opportunity or not. This positive effect of profitability on survival appeared to dissipate among the new firms that survived the first few years and matured. What then explains differences in the odds of failure for new firms when they mature? Perhaps when liabilities of newness are less of an issue, survival becomes less about profitably exploiting existing opportunities and more about expending resources to grow — grow capacity, grow market share, grow into foreign markets, etc.

6.4. Implications for the liabilities of newness literature

Our study joins a growing body of work that attempts to treat the liability of newness and similar long-studied phenomena not simply as patterned threats to survival or growth, but instead in terms of what levers may be available as actions for entrepreneurs to deal with and overcome these threats. For example, Miner's et al. (1990) study of Finnish newspapers undergoing substantial changes suggested that firms can buffer threats of dissolution by establishing institutional linkages before the transformations begin. Henderson's (1999) study of the personal computer industry demonstrated that single populations of firms can display more than one pattern of age dependence, and that a firm's technology strategy – which is obviously a strategic choice variable – strongly influences the extent to which they experience the liability of newness. Fischer and Pollock's (2004) study of survival after initial public offerings found that firms may be able to buffer the substantial threat of failure after the IPO transformation by making an effort to improve social capital and network linkages before beginning the process. Choi and Shepherd's (2005) verbal protocol study identified stakeholder perceptions of both an immaturity-based liability of newness and a youthfulness and flexibility based asset of newness and suggested ways that entrepreneurs could engage in impression management to downplay the liability and enhance the assets. Our paper contributes to this stream by showing how fundamental financial variables – which are also amenable to influence by the entrepreneur's early and ongoing strategic choices – shape a firm's experience with, and chances of surviving, the liability of newness.

We believe that this pattern of research provides the beginning of one answer to a recent and growing barrage of critical questions about the relevance of management research. Much of the research establishing the existence and patterns of the liability of newness (or debating the proper functional form of statistical models trying to differentiate newness from adolescence) at the population level is readily classified among the most theoretically driven and theoretically important organization theory research of the last several decades. This work was emphatically not originally positioned as primarily attempting to answer practical questions faced by new businesses. Nonetheless, this abstract theoretical work has provided the basis for building a series of insights about what entrepreneurs can do about this challenge. Our work, and that of others working in this area (and in many other areas as well), is rooted in the most important theoretical questions of organizational theory and strategy, yet directly addresses questions of extreme practical relevance to entrepreneurs. To us, this suggests three things. First, that practically useful work can indeed also be theoretically "interesting" regardless of whether the initial question is theoretically or practically driven (Hambrick, 2007). Second, that unlike the increasingly clamorous claims of some critics, interesting and useful "translation" of theory-driven discoveries of important empirical patterns into studies of levers useful for shaping entrepreneurial outcomes is already taking place. Third, that we should embrace all of this work as both theoretically and practically relevant and indeed embrace as well scholarly research that takes the next step toward translating this work into useful, theoretically-grounded practical knowledge that is more directly accessible to entrepreneurs. Rather than despondency about our perceived lack of "relevance" to practice, we – and perhaps especially those of us studying entrepreneurship – should rather recognize and lay claim to the theoretically interesting and practically relevant nature of our work while rejecting the mutual disparagement of either "camp." Those who reject abstract theory as irrelevant and those who reject engaged scholarship as theoretically slight are both wrong. The conversation between theory and practice in entrepreneurship scholarship is strong and we hope that our paper contributes to it in at least a small way.

6.5. Implications for entrepreneurs

Stating that sound financials are important for survival is neither a novel nor a very helpful recommendation to entrepreneurs, but the qualifiers identified in this study are very important. First, we consistently find that financial standing captured through the indicators we measure here are *more* important the younger the new firm. This suggests that new firms should pay close attention to their financials from the outset. The literature has established that most new firms are started by individuals who know a particular trade but who may not be particularly knowledgeable about financials. Proper knowledge to establish sound financials early on appears to be of substantial value. Second, among the financial constructs examined, low leverage had the greatest effect on survival. Thus, it appears that firms started with large debt are much more likely to fail. Instead, strategies relying on financial bootstrapping, such as sharing facilities and other resources (e.g., Winborg and Landstrom, 2000) and finding creative ways to

make do with the resources at hand through selective bricolage (Baker, 2007; Baker and Nelson, 2005) and effectuation (Sarasvathy, 2001) are typically more appropriate for new firm survival, which is a prerequisite to any chance for eventual growth.

6.6. Limitations and future research

We acknowledge several limitations to our study. Because we were interested in studying the liability of newness as a very general phenomenon, we included a very wide variety of organizations and industries in our sample. There is a trade-off in this approach. Prior research has clearly demonstrated that a variety of population level dynamics may shape the liability of newness. Although we included extensive industry controls, we were unable to control for the full set of industry characteristics or the full span of each industry's existence that population-level studies suggest might be important. In addition, while our financial constructs effectively tap into important internal and external aspects of liabilities, they are limited measures in at least four senses. First, there is a perceived increase in the discretion in financial reporting (Beaver et al., 2005) and suggestions that executives may inappropriately use this discretion to manipulate financial reports for their own gain (e.g., Beaver et al., 2005; O'Connor et al., 2006; Zhang et al., 2008). Although annual reports in this study were underwritten by chartered accountants, new firms are not scrutinized like stock listed companies. To the extent that manipulation of financial reports exists, however, the consequence would be attenuation of our results rather than spurious results. Second, there is little reason to believe that these measures provide an exhaustive assessment of neither internal nor external buffers for the liability of newness. External stakeholders likely examine multiple additional aspects of the new venture in order to assess legitimacy and new ventures can use strategies to increase legitimacy, such as building relationships with important institutions (Baum and Oliver, 1991). For example, over and above the type of financial constructs examined here, established social relationships with banks played an important role for the ability of firms to access credit (Uzzi, 1999). Nevertheless, we feel that accounting measures, as used in this study, can play an important role in entrepreneurship research interested in organizational and strategic issues.

Specifically, in terms of financial indicators, we also found that financial slack tapped as the amount of cash played an important role in reducing the probability of bankruptcy. There is a growing body of literature on the role of slack also examining its function among independent firms (e.g., George, 2005). We are not aware of systematic examinations of the importance of slack specifically for new firms despite claims that new firms are typically cash starved. Given such claims and the development of an extensive slack literature, extending this literature into new firms appears like a worthwhile endeavor.

Acknowledgement

The authors wish to thank seminar participants at Nordland Research Institute, Norway and Jönköping International Business School Sweden as well as the editor Phil Phan and two anonymous reviewers for their helpful suggestions.

References

Aiken, L.S., West, S.G., 1991. Multiple Regression: Testing and Interpreting Interactions. Sage Publications, Newbury Park, CA.
Aldrich, H.E., 1979. Organizations and Environments. Prentice-Hall, Englewood Cliffs, NJ.
Aldrich, H.E., 1999. Organizations Evolving. Sage.
Aldrich, J.H., Nelson, F.D., 1984. Linear Probability, Logit, and Probit Models. Sage, Beverly Hills.
Aldrich, H.E., Auster, E.R., 1986. Even dwarfs started small. In: Staw, B.M., Cummings, L.L. (Eds.), Research in Organizational Behavior, vol. 8. JAI Press, Greenwich, CT.
Aldrich, H.E., Baker, T., 2001. Learning and legitimacy: entrepreneurial responses to constraints on the emergence of new populations. In: Schoonhoven, C.B., Romanelli, E. (Eds.), The Entrepreneurship Dynamic: Origins of Entrepreneurship and its Role in Industry Creation and Evolution.
Aldrich, H.E., Ruef, M., 2006. Organizations Evolving, 2nd. ed. Sage.
Allen, M.F., Cote, J., 2005. Creditors' use of operating cash flows: an experimental study. J. Manag. Issues 17 (2), 198–211.
Almus, M., Nerlinger, E.A., 1999. Growth of new technology-based firms: which factors matter. Small Bus. Econ. 13, 141–154.
Altman, E.I., 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. J. Financ. 23 (4), 589–609.
Altman, E., 1983. Corporate financial distress: A complete guide to Predicting, Avoiding and Dealing with Bankruptcy. John Wiley and Sons Inc., New York.
Altman, I., Saunders, A., 1998. Credit risk measurement: developments over the last 20 years. J. Bank. Financ. 21, 1721–1742.
Ang, J.S., 1991. Small business uniqueness and the theory of financial management. J. Small Bus. Financ. 1 (1), 1–13.
Anthony, R.N., Govindarajan, V., 2004. Management control systems, 11th ed. McGrawHill/Irwin, Boston.
Atiya, A.F., 2001. Bankruptcy prediction for credit risk using neural networks: a survey and new results. IEEE Transactions on Neural Networks 12 (4), 929–935.
Baker, T., 2007. Resources in play: bricolage in the Toy Store(y). J. Bus. Venturing 22 (5), 694–711.
Baker, T., Nelson, R.E., 2005. Creating something from nothing: resource construction through entrepreneurial bricolage. Adm. Sci. Q. 50, 329–366.
Barrett, G.R., 1993. How small CPA firms manage their cash. J. Account. 176 (2), 56–59.
Baum, J.A.C., 1996. Organizational ecology. In: Clegg, S., Hardy, C., Nord, W.R. (Eds.), Handb. Organ. Stud. Sage, London, pp. 77–114.
Baum, J.A.C., Oliver, C., 1991. Institutional linkages and organizational mortality. Adm. Sci. Q. 36 (2), 187–218.
Beaulieu, P.R., 1994. Commercial lenders' use of accounting information in interaction with source credibility. Contemp. Account. Res. 10 (2), 557–585.
Beaulieu, P.R., 1996. A note on the role of memory in commercial loan officers' use of accounting and character information. Account. Organ. Soc. 21 (6), 515–528.
Beaver, W.H., McNichols, M.F., Rhie, J., 2005. Have financial statements become less informative? Evidence from the ability of financial ratios to predict bankruptcy. Rev. Account. Stud. 10 (1), 93–122.
Beneish, M.D., Press, E., 1993. Cost of technical violation of accounting-based debt covenants. Account. Rev. 68, 233–257.
Bhide, A., 1992. Bootstrap finance: the art of start-ups. Harvard Bus. Rev. 109–117 (Nov–Dec).
Binks, M.R., Ennew, C.T., Reed, G.V., 1992. Information asymmetries and the provision of finance to small firms. Int. Small Bus. J. 11 (1), 35–47.
Brealey, R.A., Myers, S.C., 1996. Principals of Corporate Finance. McGraw-Hill, New York.
Brüderl, J., Schüssler, R., 1990. Organizational mortality: the liabilities of newness and adolescence. Adm. Sci. Q. 35, 530–547.
Chava, S., Jarrow, R., 2004. Bankruptcy prediction with industry effects. Rev. Financ. 8 (4), 537–569.
Choi, Y.R., Shepherd, D.A., 2005. Stakeholder perceptions of age and other dimensions of newness. J. Manag. 30 (3), 377–395.
Collins, R.A., 1980. An empirical prediction on bankruptcy prediction models. Financ. Manag. 9 (2), 52–57.
Cyert, R., March, J., 1963. A behavioral theory of the firm. Prentice-Hall, Englewood Cliffs, NJ.

Davidson, S., Stickney, C.P., Weil, R.L., 1982. Financial Accounting: An Introduction to Concepts, Methods and Uses. Dryden Press, Chicago.
Davila, M., Marquart, J.W., Mullings, J.L., 2005. Beyond mother nature: contractor fraud in the wake of natural disasters. Deviant Behav. 26 (3), 271–293.
Delacroix, J., Rao, H., 1994. Externalities and ecological theory: unbundling density dependence. In: Baum, J.A.C., Sing, J.V. (Eds.), Evolutionary dynamics of organizations. Oxford University Press, New York.
Dimaggio, P., Powell, W.W., 1991. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. In: Powell, W.W., Dimaggio, P. (Eds.), The New Institutionalism in Organizational Analysis. University of Chicago Press, Chicago.
Fichman, M., Levinthal, D.A., 1991. Honeymoons and the liability of adolescence: a new perspective on duration dependence in social and organizational relationships. Academy Manag. Rev. 16, 442–468.
Fischer, H., Pollock, T., 2004. Effects of social capital and power on surviving transformational change: the case of initial public offerings. Academy Manag. J. 47 (4), 463–481.
Fotopoulos, G., Louri, H., 2000. Determinants of hazard confronting new entry: does financial structure matter? Rev. Ind. Organ. 17, 285–300.
Foster, G., 1978. Financial Statement Analysis. Prentice-Hall, Englewood Cliffs, NJ.
Foster, B.P., Ward, T.J., Woodroof, J., 1998. An analysis of the usefulness of debt defaults and going concern opinions in bankruptcy risk assessment. J. Account. Auditing Financ. 351–371 (Summer).
Freeman, J., Carroll, G.R., Hannan, M.T., 1983. The liability of newness: age dependence in organizational death rates. Am. Sociol. Rev. 48, 692–710.
Franks, J.R., Tourous, W.N., 1994. How shareholders and creditors frae in workouts and chapter 11 reorganizations. J. Financ. Econ. 35, 349–370.
Franks, J.R., Sussman, O., 2005. Financial distress and bank restructuring of small to medium size UK companies. Rev. Financ. 9 (1), 65–96.
Gartner, W.B., 2004. Handbook of entrepreneurial dynamics: the process of business creation. Sage, Thousand Oaks.
George, G., 2005. Slack resources and the performance of privately held firms. Academy Manag. J. 48 (4), 661–676.
Gong, Y., Baker, T., Miner, A.S., 2004. Where do routines come from in new ventures? Paper presented at the Academy of Management Annual Meeting, New Orleans, August.
Grant, E.L., Leavenworth, R.S., 1996. Statistical Quality Control, 7th ed. McGraw-Hill Co. Inc., New York.
Guseva, A., Rona-Tas, A., 2001. Uncertainty, risk, and trust: Russian and American credit card markets compared. Am. Sociol. Rev. 66 (5), 623–646.
Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C., 1998. Multivariate Data Analysis, 5 ed. Prentice Hall, Upper Saddle River, NJ.
Hambrick, D.C., 2007. The field of management's devotion to theory: too much of a good thing? Academy Manag. J. 50 (6), 1346–1352.
Hambrick, D.C., D'Aveni, R.A., 1988. Large corporate failures as downward spirals. Adm. Sci. Q. 33, 1–23.
Han, S.-K., 1994. Mimetic isomorphism and its effect on the audit services market. Soc. Forces 73 (2), 637–664.
Hannan, M.T., Freeman, J.H., 1984. Structural inertia and organizational change. Am. Sociol. Rev. 49, 149–164.
Hannan, M.T., Carroll, G., 1992. Dynamics of Organizational populations. Oxford University Press, New York.
Henderson, A.D., 1999. Firm strategy and age dependence: a contingent view of the liabilities of newness, adolescence, and obsolescence. Adm. Sci. Q. 44 (2), 281–314.
Hillegeist, S.A., Keating, E.K., Cram, D.P., Lundstedt, K.G., 2004. Assessing the probability of bankruptcy. Rev. Account. Stud. 9 (1), 5–34.
Hirsch, P.M., Lounsbury, M., 1997. Ending the family quarrel: toward a reconciliation of the "old" and "new" institutionalisms. Am. Behav. Scientist 40 (4), 406–418.
Honjo, Yuji, 2000. Business failure of new firms: an empirical analysis using a multiplicative hazards model. Int. J. Ind. Organ. 18, 557–574.
Hyytinen, A., Pajarinen, M., 2007. Is the cost of debt capital higher for younger firms? Scott. J. Polit. Econ. 54 (1), 55–71.
Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. Am. Econ. Rev. 76 (2), 323–329.
Jensen, M.C., 1993. The modern industrial revolution, exit and failure of internal control systems. J. Financ. 48, 831–880.
Kerwer, D., 2005. Holding global regulators accountable: the case of credit rating agencies. Governance—An Int. J. Policy Adm. 18 (3), 453–475.
Leibenstein, H., 1969. Organizational or frictional equilibria, *X*-efficiency, and the rate of innovation. Q. J. Econ. 83, 600–623.
Lemke, K.W., 1970. The evaluation of liquidity: an analytical study. J. Account. Res. 8 (1), 47–77.
Litschert, R.J., Bonham, T.W., 1978. A conceptual model of strategy formation. Academy Manag. Rev. 3 (2), 211–219.
Maksimovic, V., Phillips, G., 1998. Efficiency of bankrupt firms and industry conditions: theory and evidence. J. Financ. 53, 1495–1532.
Miller, M.H., Modigliani, F., 1961. Dividend policy, growth, and the valuation of shares. J. Bus. 34, 411–433.
Miller, K.D., Leiblein, M.J., 1996. Corporate risk-return relations: returns variability versus downside risk. Academy Manag. J. 39 (1), 91–122.
Miner, A.S., Amburgey, T.L., Stearns, T.M., 1990. Interorganizational linkages and population-dynamics — buffering and transformational shields. Adm. Sci. Q. 35 (4), 689–713.
Nelson, R.R., Winter, S.G., 1982. An Evolutionary Theory of Economic Change. Harvard University Press, Cambridge, MA.
Nohria, N., Gulati, R., 1996. Is slack good or bad for innovation? Academy Manag. J. 39, 1245–1264.
O'Connor, J., Priem, R., Coombs, J., Gilley, K.M., 2006. Do CEO stock options prevent or promote fraudulent financial reporting? Academy Manag. J. 49 (3), 483–500.
Opler, T.C., Titman, S., 1994. Financial distress and corporate performance. J. Financ. 49 (3), 1015–1040.
Ohlson, J.A., 1980. Financial ratios and the probabilistic prediction of bankruptcy. J. Account. Res. 18 (1), 109–131.
Pacini, C., Tucker, R., 2002. Make 'em pay up. J. Account. 194 (4), 67–73.
Panno, A., 2003. An empirical investigation on the determinants of capital structure: the UK and Italian experience. Appl. Financ. Econ. 13 (2), 97–103.
Park, C.C., 2003. Prior performance characteristics of related and unrelated acquirers. Strateg. Manag. J. 24 (5), 471–480.
Palmer, D.A., Jennings, P.D., Zhou, X., 1993. Late adoption of the multidivisional form by large U.S. corporations: institutional, political, and economic accounts. Adm. Sci. Q. 38 (1), 100–131.
Pettit, R.R., Singer, R.F., 1985. Small business finance: a research agenda. Financ. Manag. 14 (3), 47–60.
Pfeffer, J., Salancik, G.R., 1978. The External Control of Organizations: A Resource Dependence Perspective. Harper & Row, New York.
Powell, T.C., Lloyd, C.J., 2005. Comments and extensions on Powell (2003). Strateg. Manag. J. 26 (4), 385–394.
Rao, H., 1994. The social construction of reputation — certification contests, legitimation, and the survival of organizations in the American automobile-industry — 1895–1912. Strateg. Manag. J. 15, 29–44.
Sarasvathy, S.D., 2001. Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency. Academy Manag. Rev. 26 (2), 243–263.
Sargent, M., Young, J.E., 1991. The entrepreneurial search for capital: a behavioural science perspective. Entrep. Reg. Dev. 3, 237–252.
Scherr, F.C., Sugrue, T.F., Ward, J.B., 1993. Financing the small firm start-up: determinants of debt use. J. Small Bus. Financ. 3 (1), 17–36.
Shepherd, D.A., Shanley, M., 1998. New Venture Strategy. Sage, Thousand Oaks, CA.
Shepherd, D., Douglas, E., Shanley, M., 2000. New venture survival: ignorance, external shocks and risk reduction strategies. J. Bus. Venturing 15, 393–410.
Shin, K.S., Lee, Y.J., 2002. A genetic algorithm application in bankruptcy prediction modeling. Expert Syst. Appli. 23 (3), 321–328.
Shane, S., Stuart, S., 2002. Organizational endowments and the performance of university start-ups. Manag. Sci. 48 (1), 154–171.
Shumway, T., 2001. Forecasting bankruptcy more accurately: simple hazard model. J. Bus. 74 (1), 101–124.
Sine, W.D., Mitsuhashi, H., Kirsch, D.A., 2006. Revisiting Burns and Stalker: formal structure and new venture performance in emerging economic sectors. Academy Manag. J. 49, 121–132.
Singh, J.V., Tucker, D.J., House, R.J., 1986. Organizational legitimacy and the liability of newness. Adm. Sci. Q. 31 (2), 171–193.
Sinkey Jr., J.F., 1992. Commercial Bank Financial Management — In the Financial Services Industry. MacMillan Publishing Company, New York.
Stinchcombe, A.L., 1965. Social structure and organizations. In: March, J.G. (Ed.), Handbook of Organizations. Rand McNally, Chicago.
Stinchcombe, A.L., 1997. On the virtues of the old institutionalism. Annual Review of Sociology, vol. 23. Annual. Reviews, Inc., pp. 1–18.
Strotmann, H., 2007. Entrepreneurial survival. Small Bus. Econ. 28, 87–104.
Suchman, M.C., 1995. Managing legitimacy: strategic and institutional approaches. Academy Manag. Rev. 20, 571–610.
Thornhill, S., Amit, R., 2003. Learning about failure: bankruptcy, firm age, and the resource-based view. Organ. Sci. 14 (5), 497–509.
Uzzi, B., 1999. Embeddedness in the making of the financial capital: how social relations and networks benefit firms seeking finance. Am. Sociol. Rev. 64, 497–509.

Van de Ven, A.H., Hudson, R., Schroeder, D., 1984. Designing new business startups: entrepreneurial, organizational, and ecological considerations. J. Manag. 10 (1), 87–108.
Venkataraman, S., Van de Ven, A., 1998. Hostile environmental jolts, transaction set, and new business. J. Bus. Venturing 13 (3), 231–255.
Warner, J.B., 1977. Bankruptcy costs: some evidence. J. Financ. 26, 337–348.
Wiklund, J., Davidsson, P., Delmar, F., 2003. What do they think and feel about growth? An expectancy-value approach to small business managers' attitudes toward growth. Entrep. Theory Pract. 27 (3), 247–270.
Winborg, J., Landstrom, H., 2001. Financial bootstrapping in small businesses: examining small business managers' resource acquisition behaviors. J. Bus. Venturing 16 (3), 235–253.
Wiseman, R.M., Bromiley, P., 1996. Toward a model of risk in declining organizations: an empirical examination of risk, performance and decline. Organ. Sci. J. Inst. Manag. Sci. 7 (5), 524–543.
Zhang, Z., Bartol, K.M., Smith, K.G., Pfarrer, M.D., Khanin, D.M., 2008. CEOs on the edge: earnings manipulation and stock-based incentive misalignment. Academy Manag. J. 51 (2), 241–258.
Zmijewski, M.E., 1984. Methodological issues related to the estimation of financial distress prediction. J. Account. Res. 22 (Supplement), 59–86.