When the Going Gets Tough: Board Capital and Survival of New Economy IPO Firms[☆]

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Abstract

Does corporate governance positively influence the survival of the young firm? We address this important issue by investigating the influence of corporate governance attributes on the likelihood of survival for 127 new economy IPO companies that listed on the Australian Stock Exchange between 1994 and 2002. We use survival analysis techniques utilizing the Cox proportional hazards model with three main categories of corporate governance attributes; a) board size, b) board independence and c) ownership concentration Our choice of corporate governance attributes are based on the Principles of Good Corporate Governance and Best Practice Recommendations issued by the Australian Stock Exchange. Our empirical results suggest that board size and board independence are associated with a higher likelihood of corporate survival during periods of extreme financial duress.

JEL classification: G32; G33

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1. Introduction

Recent high profile corporate failures such as Enron have been attributed to corporate governance failures. An implication of this implicit linkage between corporate governance failure and corporate failure is that firms with higher quality governance are more likely to survive when confronted with challenging economic circumstances. Daly and Dalton (1994a) examine the relationship between board capital and corporate survival for a sample of U.S. firms. Their results show that bankrupt firms are more likely to have CEOs serving simultaneously as chairpersons. Furthermore, bankrupt firms have more affiliated directors as compared to a control sample of surviving firms, ceteris paribus. In a more recent study, Dowell, Shackell and Stuart (2007) study the impact of governance variables on the survival of internet firms that conducted their IPOs between 1996 and 1999 in the U.S. They find that board independence does not have an effect on the lifespan of the firm. However, they report that independent boards interact with founder-CEOs to hasten the firm's failure. Another interesting finding reported by Dowell et al. pertains to the non-linear relationship between board size and corporate survival. They find that firms with either smaller or larger boards survive longer than those with intermediate-sized boards.

Surprisingly, there has been very little empirical validation of the governance-survival linkage using data from other countries. We therefore study the impact of governance mechanisms on corporate survival in Australia.[1] The reason for selecting Australia is that it follows the English common law tradition that is prevalent in the US and UK. Furthermore, Australia follows free market policies like the US. One of the problems in assessing the impact of corporate provisions on firm survival in the US is the existence of state level provisions regarding takeover. It is not clear what role state level provisions play on corporate survival. So, we chose a country which does not have state-level

[1] Although both Woo, Jeffrey and Lange (1995) and Lamberto and Rath (2008) study the survival of IPOs in Australia, neither study focused on the new economy sector.

regulations on corporate governance. Our specific focus is the survival of newly listed firms belonging to the new economy. Following Hermalin and Weisbach (2003), we argue that a research design that involves a cross-sectional sample pooled over time is likely to contain too much noise to identify associations between specific corporate governance mechanisms and firm survival. Therefore, in this paper, we use a focussed sample to test the proposition that governance mechanisms are valuable during periods of economic turbulence.

We examine the corporate governance attributes that influence the likelihood of the survival of new economy IPOs companies in Australia. By focusing on a particular sector, namely the new economy sector, this study provides an opportunity to restrict the analysis to a relatively homogenous sample of firms. Existing empirical evidence shows that the performance of IPOs varies widely across the different industries (Ritter, 1991; Levis, 1993). Furthermore, Audretsch and Lehmann (2004) point out that firms in the new economy or knowledge based industries differ in their governance structure compared to traditional firms. Hensler, Rutherford and Springer (1997) and Lamberto and Rath (2008) also find that the survival likelihood of IPOs companies varies across the industries. Thus we justify our focus on the survival analysis of Australian IPOs within one particular sector, the new economy sector.

We focus on board capital, which is characterised by board size, board independence and CEO-Chairperson duality. We also consider ownership in our analysis. Furthermore, offering characteristics, financial ratios and company specific variables are also included as control variables. The board structure and relationship between the board and the top management of the firm constitute the most important attributes of corporate governance. Justifiably, in Australia, the Principles of Good Corporate Governance and Best Practice Recommendations issued by the Australian Stock Exchange deals directly with board structure and advocates that a company should structure the board to add value. Three of

the ASX recommendations under Principle 2 are considered in this study. Recommendation 2.1 states that a majority of the board should be independent directors.[2] Recommendation 2.2 also asserts that the chairperson should be an independent director. Finally, Recommendation 2.3 avers that the roles of chairperson and chief executive officer should not be exercised by the same individual.

Our sample is composed of 127 new economy companies listed on the Australian Stock Exchange (ASX) between 1994 and 2002. Sample firms are tracked until 31 December 2007 to categorise them into companies that are currently trading, delisted and suspended. The Cox proportional hazards model is then employed to identify the likelihood of survival of a company after IPOs.

Our results show that the survival time of new economy IPOs companies is negatively related to the percentage holdings of the top 20 shareholders in the firms. This suggests that a lower ownership concentration in new economy IPOs companies should be encouraged. In addition, company size and leverage are found to be negatively related to new economy IPO firms' survival. Furthermore, we find that board size, and board independence are significantly positively associated with new economy IPO companies' survival.

The remainder of the paper is organized as follows. Section 2 reviews previous studies relating to corporate governance structure and IPOs survival and provides the theoretical background for the construction of variables. Section 3 presents the details on our data and the methodology, the Cox proportional hazards model, which has been employed in the paper. The empirical results are then presented and discussed in Section 4. Finally, our conclusion and possible future extensions are discussed in the last section.

[2] In this regard, an independent director is 'independent of management and free of any business or other relationship that could reasonably be perceived to materially interfere with the exercise of their unfettered and independent judgment' (ASX, March 2003).

2. Literature Review and theoretical development

We identify three types of factors that influence the survival of new economy IPO firms. These are: 1) corporate governance attributes; 2) offering characteristics; 3) financial ratios and other company specific variables.

2.1 Corporate Governance Attributes

The development of agency theory suggests that there is a link between corporate governance and firm performance (Audretsch and Lehmann, 2004). If corporate governance influences corporate performance, then it should have some effect on corporate survival (Goktan, Kieschnick and Moussawi, 2006). Johnson et al. (2000) show that firms with weak corporate governance are vulnerable to economic downturns and increases the probability of falling into financial distress.

In this study, we explore three areas of corporate governance - board size, board independence, and ownership concentration.

Board Size

There are several theories in the literature regarding the relationship between board size and firm performance. On the one hand, small boards are more likely to monitor management better since their members are less able to hide in a large group (Fischer and Pollock, 2004). Furthermore, small groups are able to arrive at decisions more quickly than larger ones. Extant studies demonstrate that smaller boards are more likely to eliminate poorly performing CEOs (Certo, Daily and Dalton, 2001). Finally, Judge and Zeithaml (1992) find that smaller boards are more likely to be involved in strategy formation. They ascribe this result to a reduction in commitment and motivation of directors who are members of larger boards. Smaller boards are arguably more able to fulfil the monitoring role and have the advantage of speed in decision-making in their advising role.

On the other hand, larger boards, however, have a potential advantage in their advising role and are more capable of accomplishing the resource-provision role of the board of

directors. They have a greater potential for multiple perspectives, which can facilitate their advisory role. Furthermore, they may enjoy superior access to key resources (Goodstein, Gautam and Boeker, 1994). These advantages of larger boards may be particularly valuable to young, IPO firms (Fischer and Pollock, 2004). Dalton et al. (1999) conduct a meta-analysis of studies of board size and performance and conclude that there is a positive relationship between board size and financial performance. This implies that the advantages of access to additional resources due to the large board prevail over the additional agency costs and slower decision-making.

These arguments advocate a positive relationship between board size and effectiveness in terms of possessing expertise and accessing resources but a negative relationship between board size and effectiveness in terms of the board's capability to act rapidly in turbulent times and to monitor management (Goodstein, Gautam and Boeker, 1994). These contradictory relationships between board size and firm performance imply that the overall impact of board size on survival will depend on which of the board's roles is most essential in a given circumstance. The firms in our setting can profit both from the speed with which small boards can arrive at decisions and take strategic action as well as benefit from a broader range of alternatives that large boards can spawn.

Another strand of research based on key tenets of social psychology and group-decision making provides the basis for a relationship between board size and the variability of firm performance. For instance, the pioneering work of Sah and Stiglitz (1986,1991) suggest that group decision-making generally gives rise to divergent opinions since individual judgement generates errors, communication tends to be costly, and individuals differ in their information processing ability. Thus a group's final decision is a compromise that incorporates the different opinions held by the group members. Consequently, larger groups are more likely to reject risky projects since a project has to be considered good by

several group members before gaining acceptance of the group. Sah and Stiglitz (1991) confirm that the decision quality of larger group has less variability.

In the context of a large board of a company, the coordination/communication problems alluded to by Sah and Stiglitz (1991) will not only slow the decision-making process but also moderate the extremity of board decisions. Therefore, large boards' decisions are less likely to be extreme. That is, they tend to ne neither very good nor very bad. As a result, larger boards are likely to be associated with less variable corporate performance. In corroboration with this line of argument, Cheng (2008), using a sample of US firms, shows that firms with larger boards have lower variability of corporate performance. During turbulent economic circumstances, we expect large boards to avoid making risky decisions. Hence we predict that firms with larger boards should have a higher likelihood of survival.

Board Independence and CEO Influence

We believe that IPO firms facing economic turbulence are better served by a strong and independent board. Board independence defined as the percentage on non-executive directors serving on the board is taken to represent "Board Power". Ostensibly, the extent to which a strong and independent board is able to implement its monitoring, advising, and resource provision roles effectively depends on the power held by the firm's CEO. We think that if the CEO and Board are equally powerful then the IPO firm's best interests are ill-served especially during tumultuous economic circumstances. There is near consensus among financial economists regarding the leadership structure of the board. The view is that the same person should not simultaneously hold the positions of CEO and chairperson of the board. Dual leadership structure or CEO duality exists when a firm's CEO also serves as a chairman of the board of directors.

A minority posit the notion that a combined CEO chairperson structure provides a "focal point" for leadership and precludes ambiguity regarding responsibility. However, the unifying power provided by duality of the leadership structure may be less beneficial when an IPO firm faces a period of decline prior to bankruptcy. Thus CEO power could be measures by the existence of duality in the leadership structure.

It is interesting to note that in Australia, the Principles of Good Corporate Governance and Best Practice Recommendations issued by the Australian Stock Exchange deals directly with board structure and states that a company should structure the board to add value. In this regard, an independent director is 'independent of management and free of any business or other relationship that could reasonably be perceived to materially interfere with the exercise of their unfettered and independent judgment' (ASX, March 2003).

Three of the ASX recommendations under Principle 2 are considered in this study. Recommendation 2.1 states that a majority of the board should be independent directors. Recommendation 2.2 is that the chairperson should be an independent director. Finally, the point of Recommendation 2.3 is that the roles of chairperson and chief executive officer should not be exercised by the same individual.

Percentage of Independent Directors

While the importance of board independence has been generally acknowledged, there is no common consensus regarding the definition of 'independence' (Brennan and McDermott, 2004; Kang, Cheng and Gray, 2007). Previous studies have used the word 'outside directors' instead of 'independence' to describe directors who are presumed to be independent from management (Ajinkya, Bhojraj and Sengupta, 2005). Some existing studies simply consider the differences between 'executive' and 'non-executive' directors (Kang, Cheng and Gray, 2007; Lamberto and Rath, 2008). For the purpose of this study, all

non-executive directors are classified as ‘independent directors’ following Lamberto and Rath (2008).

Based on our arguments presented above, the percentage of independent directors on the board is expected to positively related to the likelihood of survival of an IPO firm.

Dual Leadership Structure and Non-Executive Chairman

The chairman is responsible for leading the board, for efficient organization and the conduct of the board’s function, and for briefing the directors in relation to issues arising at board meetings (ASX, March 2003). The board of directors is an economic institution that may help to reduce agency problems between managers and shareholders. The board provides management with contractual incentives and ensure the contracts are fulfilled by management (Audretsch and Lehmann, 2004). Of particular interest during times of financial decline is the resource provision role of the board. We therefore posit that a non-executive chairman increases the survival likelihood of IPO firms.

The evidence on the effect of CEO duality on corporate performance is mixed (Arthur et al., 1993; Pi and Timme, 1993). While some studies e.g. Jensen (1993), Rechner and Dalton (1991) and Daily and Dalton (1994b) argued that boards in which the chairperson and CEO are same person leads to ineffective boards, Elsayed (2007) found that CEO duality has no impact on corporate performance. However, CEO duality attracts a positive and significant coefficient only when corporate performance is low.

Furthermore, Brickley, Coles and Jarrell (1997) claimed that proponents of the dual leadership structure base their arguments on a mix of anecdotal evidence and an intuitive appeal to common sense. They suggested that there are both costs and benefits to a dual

leadership structure. This structure may create a potential for rivalry between the CEO and the chairperson, making it difficult to pinpoint blame for poor performance[3].

Therefore, we test the proposition that a board led by an independent leader will better ensure the survival of the IPO firm during declining economic circumstances.

Ownership Concentration

Woo, Jeffrey and Lange (1995) found that low ownership concentration is related to corporate longevity and argued that their result is inconsistent with agency theory which linked firm performance to higher levels of owner retention. Kang, Cheng and Gray (2007) also found that ownership concentration is significantly negatively associated with an independent board of directors. This may imply that lower ownership concentration leads to a higher probability of firm survival. However, Demsetz and Lehn (1985) found that corporate ownership concentration is not related to the accounting profit rates of a company.

It can be seen that the conclusion regarding the effect of ownership concentration remaining on firm survival is unclear. In this study, ownership concentration is measured by the proportion of common stock held by the top 20 shareholders. This measurement is consistent with the studies discussed above.

2.2 Offering Characteristics

Existing literature employed offering characteristics of IPOs in examining IPOs post listing performance (Bhabra and Pettway, 2003), explaining initial return, long run return and the relationship between initial and seasoned offerings (Murgulov, 2006). This study uses offering characteristics data for investigating new economy Australian IPOs company survival. The variables details are follows.

[3] In Australia, Recommendation 2.3 of the Principle of Good Corporate Governance and Best Practice advocates the separation of the positions of CEO and chairperson.

Offer Price

Ho et al.(2001) indicated that IPOs are typically underpriced, that is, an investor who purchases new issues at the offering price can, on average, make relatively large returns. To compensate investors for the greater uncertainty, higher risk IPOs have higher initial returns. Therefore, IPOs with a higher ex ante uncertainty are more underpriced than those with lower ex ante uncertainty. This hypothesis is consistent with Lamberto and Rath (2008). Thus, we expect a positive relationship between offer price and IPOs survival.

Offer Size

The size of the offering is expected to be positively related to the firm's survival. It is argued that larger offerings signal market confidence, more stringent monitoring (Lamberto and Rath, 2008) and good prospects (Jain and Kini, 2000). Ritter (1991) suggested that smaller offers tend to have the worst aftermarket performance. Furthermore, previous studies of American IPOs e.g. Hensler, Rutherford and Springer (1997) and Jain and Kini (1999) found that the size of offering is positively related to firm survival**.**

Age at Offering

Firm age has been used as a proxy for risk (Ritter, 1991; Ho et al., 2001). Ritter (1991) found that older firms performed better in the after-market than younger ones. Established firms are expected to have a more stable source of business, be less speculative and also more likely to survive than young firms (Lamberto and Rath, 2008). Therefore, it is expected that the company age at offering should be positively related to its likelihood of survival.

Retained Ownership

Leland and Pyle (1977) argued that firm owners can signal quality in equity markets by retaining equity. Consistent with signal theory, a high percentage of insider ownership

retention at IPOs serves as a certification that managerial decisions will coincide with the outside shareholder's interest, which results in less agency costs and better firm performance after the offering (Jensen and Meckling, 1976).

However, the empirical results are mixed. While Hensler, Rutherford and Springer (1997) suggested that IPOs firm with higher percentage of retained ownership have a longer survival period, Lamberto and Rath (2008) found that ownership retention is not significantly related to IPOs firm survival. We expect that the percentage of stock retained by pre-IPO shareholders is positively related to IPOs company survival.

Underwriter Backing

It is in the best interest of the underwriter to endorse companies with sound prospects and it is a fact that most underwriters invest in the offers they underwrite (Lamberto and Rath, 2008). Therefore, it is expected that companies with underwriter backing should be more likely to survive than those without.

Auditor Reputation

Auditor reputation is included as indicator variables with a value of one if the auditor is from one of the Big 5 accounting firms and zero otherwise. The Big 5 companies include PricewaterhouseCoopers, KPMG, Arthur Anderson, Deloitte Touche Tohmatsu and Ernst and Young (How, Izan and Monroe, 1995; Dimovski and Brooks, 2003; Lamberto and Rath, 2008). Extant literature suggests that reputable auditors tend to lessen the amount of underpricing achieved by an IPO candidate since they are construed as providing a signal of the quality of information to potential investors (How and Yeo, 2000).

Therefore, we expect that companies with an auditor from one of the Big 5 companies should have a higher likelihood of survival than those with an auditor from a smaller auditor firms.

Number of Risk Factors in the Prospectus

Risk can be proxied directly using the number of risk factors listed in the prospectus (Bhabra and Pettway, 2003). Assuming full disclosure, the number of risk factors listed in the prospectus should be negatively related to survival (Lamberto and Rath, 2008). Firms with more risk factors listed in the prospectus suggest a riskier firm and hence an increased likelihood of failure. The informational value of the number of risk factors was found to be significant negatively related to the likelihood of survival of American IPOs by Hensler, Rutherford and Springer (1997) and Bhabra and Pettway (2003). We expect that the number of risk factors listed in the prospectus is negatively related to the survival likelihood of IPOs.

2.3 Financial Ratios and Company Specific Variables

Four categories of financial ratios are used in this study. The details are as follows.

Liquidity Ratio

The liquidity ratios measure a firm's ability to meet its current obligations as they become due. Liquidity ratios also have been used to measure short term solvency. Higher levels of liquidity provide a strong barrier against financial failure. In this study, the current ratio is a measure of a firm's liquidity.

Profitability Ratio

It is expected that companies with a high profitability ratio will have more likelihood of survival. This study utilizes return on asset (ROA) as a measure of profitability ratio. The profitability ratios measure the firm's ability to generate earnings. Many firms face financial distress when their earning is negative. Therefore profit is often used as a predictor of financial distress events.

Leverage Ratio

Financial risk show the firm's ability to find the sources of external funds provided for in the benefit of their shareholder. The degree of financial risk is related to the likelihood

of financial distress (Lee and Yeh, 2004). It is expected that companies with a higher leverage are more likely to go bankrupt. Debt ratio is used as a measure of leverage in this study.

Activity Ratio

The activity ratios measure the efficiency of a firm's asset utilization. They measure the ability of a firm to use assets to generate revenue or return. If firms can use assets efficiently, they will earn more revenue and increase liquidity. Total asset turnover ratio is employed in this study.

We use the following company specific characteristics in the analysis:

Company Size

Prior literature has presented that firm survival is negatively correlated with firm size. The rationale for this relationship is that larger firms have more ability to avoid financial distress by using public equity markets (Goktan, Kieschnick and Moussawi, 2006). Schultz (1993) found an inverse relationship between the probability of delisting and firm size. Smaller firms have a higher probability of delisting and larger firms have a higher probability of survival. Therefore, it is expected that larger IPOs firms will survive longer than smaller ones.

IPO_9900

To examine the effect of IPO timing, a dummy variable is used indicating whether a company has issued stock between 1999 and April 2000. The definition of a variable is adapted from and Ho et al. (2001) and Kauffman and Wang (2007). We expect that companies that went public between 1999 and April 2000 are more likely to fail because April 2000 is the date generally recognized by Australian financial market participants as coinciding with the 'bursting of the dot come bubble' (Ho et al., 2001).

Venture capital-backed IPOs

Barry et al. (1990) and Megginson and Weiss (1991), posit that VC-backing certifies the quality of the IPO. Their empirical evidence shows less underpricing for VC-backed firms as compared to non-VC-backed firms. Gompers (1995) in his study of venture capitalists shows that they specialize in collecting and evaluating information of start-up and growth companies. Furthermore, they tend to take substantial stakes in the IPO firms and frequently sit on the boards. Venture Capitalists can be an additional source of resource and advice during periods of economic duress faced by newly public firms.

We list all the variables used in this study and provide detailed definitions in Table 1.

Table 1: The variables used in the study

Variable Code	Variable Name	Definition of Variable
	Corporate Governance Attributes:	
BD_SIZE	**Board Size**	Number of directors on the board including chairman.
	Board Independence	
BD_INDP	Percentage of Independent Directors	The ratio of the number of non-executive directors to the number of directors, as listed in the prospectus.
CM_NEXC	Non-Executive Chairman	If the chairman listed in the prospectus is a non-executive director then a value of 1 is recorded, 0 otherwise.
CM_DUAL	Dual Leadership Structure	If the chairman and CEO are different people then a value of 1 is recorded, 0 otherwise.
	Ownership Concentration	
TOP20	Top 20 Shareholders	The proportion of common stock held by the top 20 shareholders.
	Offering Characteristics:	
OF_PRICE	Offering Price	The offer price listed in the prospectus, or the midpoint of the price range.
OF_SIZE	Offering Size	The size of the offering listed in the prospectus, or the minimum subscription amount.
OF_AGE	Offering Age	The difference between the year in which the prospectus was lodged and the year in which the company was founded.
RETAIN	Retained Ownership	The difference between the market capitalization of the company after listing and the size of the offering, divided by the market capitalization of the company after listing.
BACK	Underwriter Backing	Initial public offerings which had an underwriter recorded a value of 1, 0 otherwise.
BIG5	Auditor Reputation	Initial public offerings which had an auditor belonging to one of the Big 5 Accounting firms recorded a value of 1, 0 otherwise. The Big 5 accounting firms include PricewaterhouseCoopers, KPMG, Arthur Anderson, Deloitte Touche Tohmatsu and Ernst and Young.
NUM_RISK	Number of Risk Factors in the Prospectus	The number of risk factors listed in the prospectus. If there is no specific risk factor section, the number is 0.
	Financial Ratios:	
ROA	Profitability	Return on Asset (ROA): Earnings before interest/(total assets-outside equity interests).
CUR	Liquidity Ratio	Current Ratio: Current assets/current liabilities.
DET	Leverage Ratio	Debt Ratio: Total debt/total assets.
TAT	Activity Ratio	Total Asset Turnover: Operating revenue/total assets.
	Company-Specific Variables:	
C_SIZE	Company Size	The logarithm of total assets of the firm.
IPO_9900	IPO_9900	A dummy variable recorded a value of 1 if a company issued stock between 1999 and April 2000, 0 otherwise.
VC_BACKED	Venture Capital-Backed IPOs	A dummy variable recorded a value of 1 if a company is a venture capital-backed IPO, 0 otherwise.

3.1 Data and Sample

In this study, a new economy company is defined as an entity with business activities in any high technology production or service. In particular, IPOs in four industry sectors based on GICS[2] include information technology; media[3]; telecommunication services and health care are examined. This definition of new economy company is consistent with Murgulov (2006).

The new economy IPOs companies listed in Australia between 1994 and 2002 are included in estimating Cox proportional hazards model. 2002 is chosen as the cut off year because it allows five years of post-listing accounting information at the time of data collection. Each IPO company is tracked from the listing on ASX until 31 December 2007 or until it is delisted or suspended.

The sample of IPOs and their prospectuses are collected mainly from the *Annual Reports Online* database. Some of the IPO prospectuses are not available on the *Annual Reports Online* database. In those cases, the prospectuses were obtained from the *Connect 4 Company Prospectuses* database. Industry sector and financial information of the companies was obtained from the *FinAnalysis* database.

In this study, non-survivors or failed companies are simply defined as companies which have been delisted or suspended from the ASX. Survivors are companies which remain trading on the ASX. This definition is consistent with Lamberto and Rath (2008) and Welbourne and Andrews (1996). Correspondingly, survival time is measured as the number of years between the year of listing and the year the company is delisted or suspended from the ASX for non-survivors IPOs companies or the year end of observation

[2] GICS is an enhanced industry classification system jointly developed by Standard & Poor's and Morgan Stanley Capital International (MSCI) in 1991 to meet the needs of the investment community for a classification system that reflects a company's financial performance and financial analysis (Standard and Poor's, 2002).

[3] According to GICS, media is an industry group rather than an industry sector. It belongs to the consumer discretionary industry sector.

period for survivor IPOs companies. The final sample consists of 127 new economy Australian IPOs companies. Among these companies, 93 companies are survivors and 34 companies are non-survivors.

The distribution of new economy IPOs companies between 1994 and 2002 by industry sector and by company status is presented in Table 2 and Table 3, respectively.

Table 2: New economy IPOs companies listed between 1994 and 2002 stratified by GICS industry sector

GICS Industry Sector	N	Percent
Information Technology	55	43.31
Media	13	10.24
Telecommunication Services	14	11.02
Health Care	45	35.43
Total	127	100.00

Note: N is the number of companies. Percent is the number of companies in a particular industry group as a proportion of total number of companies.

Table 3: New economy IPOs companies listed between 1994 and 2002 stratified by company status

Trading Status	N	Percent
Trading	93	73.23
Delisted	32	25.20
Suspended	2	1.57
Total	127	100.00

Note: N is the number of companies. Percent is the number of companies in a particular industry group as a proportion of total number of companies.

3.2 Methodology

In order to analyze the factors influencing the survival of new economy Australian IPOs companies, we employed a Cox proportional hazards model which is a semi parametric model that uses survival analysis techniques.

Existing literature has employed Cox proportional hazards model in IPOs survival analysis e.g. Kauffman and Wang (2001), Cockburn and Wagner (2007), Kauffman and Wang (2007) and Lamberto and Rath (2008). Other IPO survival studies used other techniques in survival analysis e.g. Weibull model (Woo, Jeffrey and Lange, 1995; Audretsch and Lehmann, 2004), log-normal model (Woo, Jeffrey and Lange, 1995), log-logistic (Hensler, Rutherford and Springer, 1997) and piecewise exponential model (Yang and Sheu, 2006).

There exist two key advantages of survival analysis compared to the traditional methods e.g. MDA, logit and probit models. These advantages include that the ability to handle time-varying covariates and censored observations.

In this context, time varying covariates are the explanatory variables that change with time. Financial ratios used in this study are time varying covariates as their values change over time. Censored observations are the observations that have never experienced the event during the observation time. Censoring occurs when the duration of the study is limited in time. In this study, censored observations are the IPO companies which are still trading on the ASX at the end of the observation period which is 31 December 2007.

Survival analysis consists of two key functions called the survivor function and the hazard function. The survival function, *S(t)*, gives the probability that the time until the firm experiences the event, *T*, is greater than a given time *t*. Given that *T* is a random variable which defines the event time for some particular observation, then the survival function is defined as.

$$S(t) = \Pr(T > t) \tag{1}$$

The hazard function defines the instantaneous risk of an event occurring at time *t* given the firm survives to time *t*. The hazard function is also known as the 'hazard rate' because it can be represented as the number of events per interval of time. The hazard function is defined as:

$$h(t) = \lim_{\Delta t \to 0} \frac{\Pr(t \le T < t + \Delta t | X, T \ge t)}{\Delta t} \tag{2}$$

The most widely used Cox proportional hazards (PH) model is a semi-parametric model for survival analysis. In the Cox (1972) study, there are two significant innovations including the proportional hazards model and maximum partial likelihood. The proportional hazards model is represented as

$$h_i(t) = h_0(t)\exp(X_i\beta) \tag{3}$$

where $h_0(t)$ is an arbitrary unspecified baseline hazard rate which measures the effect of time on the hazard rate for an individual whose covariates all have values of zero. *X*

represents the vector of covariates that influences the hazard and β is the vector of their coefficients.

Equivalently, the regression model is written as

$$\log h_i(t) = \alpha(t) + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_k X_{ik} \quad (4)$$

where $\alpha(t) = \log h_0(t)$ and $h_0(t)$ is an arbitrary unspecified baseline hazard rate (LeClere, 2000).

The model does not require the particular probability distribution specification of the survival times, but it possesses the property that different individuals have hazard functions that are proportional, i.e.

$$\frac{h_i(t)}{h_j(t)} = \exp[\beta_1(X_{i1} - X_{j1}) + \beta_2(X_{i2} - X_{j2}) + \ldots + \beta_k(X_{ik} - X_{jk})] \quad (5)$$

The ratio of the hazard functions for two individuals does not vary with time *t*. These special properties make the Cox's PH model robust and popular amongst researchers.

To estimate the coefficients of β, Cox (1972) proposes a partial likelihood function based on a conditional probability of failure by assuming that there are no tied values in the survival times. The function was later modified to handle ties (Efron, 1977). In this study, we use SAS PROC PHREG to conduct the estimation.

4. Empirical Results

4.1 Descriptive Statistics

In order to prevent the influence of observations with extreme values observations are truncated at the specified thresholds. All observations with covariate values higher than the ninety-ninth percentile of each covariate are set to that value. In the same way, all covariate values lower than the first percentile of each covariate are truncated. This procedure is similar to the one employed by Shumway (2001).

Table 4 presents descriptive statistics of the data employed in the study after the truncation stratified by company status. The descriptive statistics include the number of

observations, means, medians, min, max, standard deviations, skewness and kurtosis for each company status which are presented in this section. It should be noted that because of the binary or dummy variables that have been used for some factors, the mean for these variables should be interpreted as the percentage of companies in the sample. The binary variables employed in this study include CM_NEXC, CM_DUAL, BACK, BIG5, IPO_9900, and VC-BACKED.

The Kruskal-Wallis test, a non-parametric test, is employed for testing for significant differences between the group means. Variables with significant differences in their group means will be expected to add information to a regression analysis. The variables TOP20, OF_PRICE, BACK, C_SIZE and VC-BACKED display significant differences across the subsamples.

According to Table 4, the mean number of directors for both survivor and non-survivors new economy IPOs companies is five, which is consistent with Lamberto and Rath (2008) and Rosa, Izan and Lin (2004). Both studies find that the majority of IPO companies have less than six directors in the board which is the minimum number of directors recommended by the ASX for good governance. The mean percentage of non-executive directors on the board were 53.41 and 61.96 for active and non-survivor IPOs companies, respectively. This figure implies that the majority of directors in the new economy Australian IPOs company board are independent directors. In addition, 64.42 and 69.59 percent of active and non-survivor new economy IPO companies, respectively, have a non-executive chairman, and 85.51 and 84.80 percent of these companies have the positions of CEO and chairperson held by different persons. These results suggest that the majority of new economy Australian IPOs companies have boards which can be considered independent. Furthermore, the mean percentages of the top 20 shareholders for active and non-survivor companies are 65.98 and 76.77 percent, respectively.

In terms of the offering characteristics, the median offering price is A$0.50 for the survivors and A$1.00 for the non-survivors. The median offer sizes are A$8 and A$12 million and the medians of offering age are 3.04 and 4.51 years for the survivor and non-survivor companies, respectively. These results suggest that the new economy Australian IPO companies are relatively young and small, consistent with the results reported by Lamberto and Rath (2008).

Additionally, 73.98 and 90.06 percent of the offerings by active and non-survivor companies are underwritten while 53.16 and 70.18 percent of the offerings by active and non-survivor companies have an auditor from the one of the Big 5 accounting firms. On average, the number of risk factors identified in the prospectus were 13 and 14 for active and non-survivor companies, respectively. The means of retained ownership by pre-IPOs owners were 62.16 and 70.48 percent for active and non-survivor IPOs companies, respectively, which implies that the control of new economy IPO companies was retained by the original owners. It is also interesting to note that 39.52 and 35.67 percent of active and non-survivor IPOs companies are listed during the period 1999 to April 2000.

The profitability ratios, which show the ability of the company to generate profit, are negative for both groups. The means of ROA for active and non-survivor companies are -0.29 and -0.35, respectively. This result suggests that non-survivor IPOs companies have lower earnings than active companies. But the difference is not statistically significant. The liquidity ratio, CUR, of non-survivor companies have higher mean as compared to the active firm subsample. The means of DET indicates that the long term liability paying ability of non-survivor companies is less than that of active companies. For the activity ratio, TAT, the means of non-survivor companies is higher than those of the survivors. However, the Kruskal-Wallis test suggests that there is no difference in means of these ratios between active and non-survivor new economy IPO companies.

The mean SIZE of active and non-survivor companies are 7.27 and 7.41, respectively. The Kruskal-Wallis test shows that, on average, the size of active and non-survivor new economy IPOs companies in our sample are statistically significantly different at the 10 percent level. Finally, the survivor and non-survivor samples significantly differ with respect to the percentage of firms backed by venture capitalists. 10.97% of survivors are backed by venture capitalists while 30.99% of the non-survivors have VC-backing.

The Pearson correlation coefficients across the variables are shown in Table 5. The results suggest weak relationships across the variables. We do not find any large and significant coefficients that indicate serious problems of multicollinearity.

Table 4: Descriptive statistics of the data

	BD_SIZE	BD_INDP	CM_NEXC	CM_DUAL	TOP20	OF_PRICE	OF_SIZE	OF_AGE	RETAIN	BACK	BIG5	NUM_RISK
Survivor IPOs (n=93)												
Mean	5.1885	53.4149	0.6442	0.8551	65.9798	0.8857	32.9512	5.7981	62.1626	0.7398	0.5316	12.7173
Median	5.0000	60.0000	1.0000	1.0000	70.0000	0.5000	8.0000	3.0493	70.0000	1.0000	1.0000	12.0000
Min	3.0000	0.0000	0.0000	0.0000	14.4000	0.2000	1.5000	0.0027	0.0000	0.0000	0.0000	0.0000
Max	10.0000	83.0000	1.0000	1.0000	94.1400	4.6000	421.0940	38.4603	96.3400	1.0000	1.0000	31.0000
Std Dev.	1.3198	19.5939	0.4791	0.3522	18.6702	0.8525	73.9985	7.1613	23.6733	0.4391	0.4994	5.3226
Skewness	0.6119	-0.6757	-0.6035	-2.0223	-0.8569	2.4452	3.7922	1.9579	-1.1423	-1.0955	-0.1271	0.8013
Kurtosis	0.9508	-0.1034	-1.6404	2.0955	0.0362	7.2115	14.4321	4.7397	0.6540	-0.8022	-1.9894	2.0205
Non-Survivor IPOs (n=34)												
Mean	5.1345	61.9591	0.6959	0.8480	76.7651	0.9282	135.0988	6.2423	70.4801	0.9006	0.7018	14.2456
Median	5.0000	67.0000	1.0000	1.0000	78.4100	1.0000	12.0000	4.5068	74.3400	1.0000	1.0000	13.0000
Min	3.0000	0.0000	0.0000	0.0000	19.9900	0.2000	1.0000	0.0082	0.0000	0.0000	0.0000	7.0000
Max	9.0000	89.0000	1.0000	1.0000	98.2800	2.0000	6652.7300	18.8301	99.5200	1.0000	1.0000	25.0000
Std Dev.	1.1270	20.0849	0.4614	0.3601	14.5248	0.4959	873.7467	5.4964	20.0611	0.3001	0.4588	3.7555
Skewness	0.8544	-0.8914	-0.8593	-1.9553	-0.6455	0.2855	7.4087	0.5869	-1.0167	-2.7013	-0.8898	0.9136
Kurtosis	1.7554	0.2530	-1.2767	1.8446	0.3556	-0.6623	53.5469	-0.9495	1.2692	5.3595	-1.2226	0.8229
Kruskal-Wallis Test	0.0864	2.5854	0.1069	0.2197	7.2061	3.6893	0.6289	0.2592	0.9395	2.8339	2.2513	1.9929
p-value	0.7688	0.1079	0.7437	0.6393	0.0073	0.0548	0.4277	0.6107	0.3324	0.0923	0.1335	0.1580

	ROA	**CUR**	**TAT**	**DET**	**C_SIZE**	**IPO_9900**	**VC_BACKED**
Survivor IPOs (n=93)							
Mean	-0.2895	7.1661	0.8726	0.4290	7.2674	0.3952	0.1097
Median	-0.0590	2.0000	0.6130	0.3106	7.2258	0.0000	0.0000
Min	-6.0955	0.0200	0.0000	0.0008	5.6139	0.0000	0.0000
Max	0.5770	331.5200	4.8237	4.1984	9.4247	1.0000	1.0000
Std Dev.	0.7464	20.6795	0.9768	0.5321	0.7685	0.4892	0.3127
Skewness	-3.9595	9.1896	1.8291	4.4175	0.5033	0.4296	2.5030
Kurtosis	21.5622	116.2732	3.6165	25.5749	0.3938	-1.8206	4.2771
Non-Survivor IPOs (n=34)							
Mean	-0.3533	7.0450	0.9472	0.5034	7.4054	0.3567	0.3099
Median	-0.0132	1.8100	0.6198	0.3418	7.3498	0.0000	0.0000
Min	-6.0955	0.0200	0.0000	0.0009	5.6139	0.0000	0.0000
Max	0.5770	567.0300	4.8237	4.1984	9.4247	1.0000	1.0000
Std Dev.	1.1682	43.3931	0.9932	0.6012	0.7292	0.4804	0.4638
Skewness	-4.2630	12.7933	1.6825	3.5528	0.1647	0.6035	0.8292
Kurtosis	18.3912	165.9545	3.4190	16.4266	0.3321	-1.6553	-1.3281
Kruskal-Wallis Test	1.0930	0.2092	0.5770	1.4612	3.3274*	0.1226	5.5339**
p-value	0.2958	0.6474	0.4475	0.2267	0.0681	0.7263	0.0187

Note: Descriptive statistics grouped by company status. n is the number of companies. Kruskal-Wallis Test (a non-parametric test) for testing the equality of group means.

** Significant at the 10 percent level, ** Significant at the 5 percent level.*

Table 5: Pearson correlation coefficients

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. BD_SIZE	1.0000	0.0845[a] 0.0121[b]	0.0340 0.3136	0.1849 <.0001	0.0377 0.2637	0.4475 <.0001	0.2551 <.0001	-0.0901 0.0074	-0.0458 0.1738	-0.0842 0.0124	0.1681 <.0001	0.0399 0.2364	0.0601 0.0745	-0.0246 0.4657	-0.0200 0.5527	0.0062 0.8534	0.5228 <.0001	-0.1358 <.0001	0.2128 <.0001
2. BD_INDP		1.0000	0.3518 <.0001	0.1849 <.0001	0.1305 0.0001	-0.0186 0.5808	0.0857 0.0109	0.0139 0.6798	-0.0101 0.7645	0.1239 0.0002	0.1466 <.0001	0.1447 <.0001	-0.0919 0.0063	0.0172 0.6096	-0.0447 0.1849	0.0672 0.0460	-0.0944 0.0050	0.0601 0.0743	0.2107 <.0001
3. CM_NEXC			1.0000	0.3332 <.0001	-0.1602 <.0001	0.0152 0.6514	0.0132 0.6958	-0.0109 0.7457	0.0043 0.8988	0.0235 0.4853	-0.0951 0.0047	0.0825 0.0142	-0.0834 0.0132	0.0125 0.7119	-0.0108 0.7478	-0.0432 0.2002	-0.1006 0.0028	0.0355 0.2917	0.0422 0.2102
4. CM_DUAL				1.0000	-0.0459 0.1731	0.1038 0.0020	0.0464 0.1687	-0.1522 <.0001	0.0041 0.9036	0.0951 0.0047	0.0248 0.4615	0.1096 0.0011	-0.0270 0.4237	-0.0985 0.0034	0.0937 0.0054	0.0716 0.0336	0.0803 0.0171	0.0792 0.0187	0.0466 0.1672
5. TOP20					1.0000	0.0996 0.0031	0.0414 0.2192	0.1746 <.0001	0.3515 <.0001	0.1389 <.0001	-0.0610 0.0704	0.1277 0.0001	0.0414 0.2198	-0.0546 0.1053	0.0874 0.0094	0.0816 0.0153	0.0661 0.0497	-0.1725 <.0001	0.1040 0.0020
6. OF_PRICE						1.0000	0.1790 <.0001	-0.0404 0.2311	-0.0186 0.5807	-0.1787 <.0001	0.0875 0.0093	0.0254 0.4513	0.1528 <.0001	-0.0890 0.0082	0.0651 0.0534	0.0803 0.0170	0.5380 <.0001	-0.0215 0.5231	0.0603 0.0735
7. OF_SIZE							1.0000	-0.0079 0.8154	-0.1949 <.0001	-0.1522 <.0001	0.0643 0.0565	0.0093 0.7838	0.0444 0.1876	-0.0241 0.4740	0.0514 0.1269	0.0945 0.0050	0.2401 <.0001	-0.0423 0.2091	0.1331 <.0001
8. OF_AGE								1.0000	0.0815 0.0154	0.1514 <.0001	-0.0394 0.2428	-0.1600 <.0001	0.1266 0.0002	-0.1096 0.0011	0.0980 0.0036	0.0172 0.6093	0.0377 0.2639	0.0641 0.0569	-0.0187 0.5802
9. RETAIN									1.0000	0.1507 <.0001	0.0103 0.7606	0.2281 <.0001	-0.0800 0.0174	-0.1107 0.0010	0.0251 0.4573	0.0637 0.0587	-0.0913 0.0066	-0.1025 0.0023	0.0382 0.2573
10. BACK										1.0000	0.0166 0.6220	-0.1184 0.0004	0.0187 0.5783	-0.0494 0.1425	0.1657 <.0001	0.0778 0.0209	-0.0472 0.1611	0.0406 0.2287	0.0152 0.6523
11. BIG5											1.0000	0.0868 0.0099	0.0119 0.7246	-0.0179 0.5947	-0.1083 0.0013	0.0486 0.1496	0.1275 0.0001	-0.0005 0.9887	0.1803 <.0001
12. NUM_RISK												1.0000	-0.0494 0.1429	-0.0172 0.6109	0.0048 0.8864	0.0355 0.2921	-0.0032 0.9233	0.0784 0.0199	0.1505 <.0001
13. ROA													1.0000	0.0442 0.1894	-0.0158 0.6402	-0.4817 <.0001	0.4663 <.0001	-0.0040 0.9052	-0.0145 0.6668
14. CUR														1.0000	-0.1493 <.0001	-0.1634 <.0001	-0.0814 0.0157	-0.0492 0.1446	-0.0390 0.2474
15. TAT															1.0000	0.4016 <.0001	0.0274 0.4171	0.0686 0.0416	-0.0570 0.0908
16. DET																1.0000	-0.1472 <.0001	0.0544 0.1064	-0.0213 0.5283
17. C_SIZE																	1.0000	-0.0797 0.0179	0.1066 0.0015
18. IPO9900																		1.0000	-0.0837 0.0129
19. VC_BACKED																			1.0000

Note: a. Pearson correlation coefficients.

b. The p-value under the null hypothesis of zero correlation.

4.2 Cox Proportional Hazards Model Estimation Results

We employ the Cox proportional hazards model to investigate the influence of corporate governance variables on the survival of new economy IPO companies. In addition to corporate governance variables, we also include offering characteristics, financial ratios and company-specific variables. The estimation results are presented in Table 6.

We use the default specification for selecting the variables method in PROC PHREG procedure in SAS. The SAS PROC PHREG fits the complete model as specified in the MODEL statement. The covariates are selected from the full model (all variables are included in the model), instead of backward, forward or stepwise selection procedures. The results reported in Table 6 shows only significant covariates.

Table 6: Estimation Results of Cox Proportional Hazards Model

Covariate	Coefficient	Standard Error	χ^2 Statistic	*p*-Value	Hazard Ratio
BD_SIZE	-0.3207*	0.1905	2.8347	0.0923	0.726
BD_INDP	-0.08172*	0.04595	3.1621	0.0754	0.9220
BD_INDP2	0.0008*	0.0004	3.4712	0.0624	1.001
TOP20	0.0360**	0.0147	6.0094	0.0142	1.0370
BACK	1.2343*	0.6735	3.3586	0.0669	3.436
VC_BACKED	0.8969*	0.4728	3.5988	0.0578	2.4520
DET	0.6797*	0.3260	4.3468	0.0371	1.973
C_SIZE	0.7379**	0.3386	4.7510	0.0293	2.0920

*Note: *Significant at a 10 percent level.*
*** Significant at a 5 percent level.*

Table 6 presents the coefficients, estimated standard error of this estimate, Wald chi-square tests along with the relative *p*-value for testing the null hypothesis that the coefficient of each covariate is equal to zero. Finally, the hazard ratio is presented in the last column. Hazard ratio is obtained by computing e^{β} where β is the coefficient in the proportional hazards model. A hazard ratio equal to 1 indicates that the covariate has no

effect on survival. If the hazard ratio is greater (less) than 1, then this indicates a more rapid (slower) hazard timing.

Based on *p*-values, only three variables are significant at the 5 percent level. These are TOP20, DET and C_ SIZE with coefficients of 0.0360, 0.6797 and 0.7379, respectively. The variables BD-SIZE, BD_INDP, BD_INDP2, BACK and VC_BACKED are statistically significant at the 10 percent level.

Our results indicate that board size has a negative estimated coefficient with a hazard ratio of 0.726. This implies that increasing the size by one member is associated with a 27.4% reduction in the risk of corporate failure. Likewise board independence also has a beneficial effect on firm survival. We do observe a non-linearity in the relationship between board independence and likelihood of survival. The other corporate governance variables such as CM_NEXC and CM_DUAL do not significantly alter the IPO firms' chance of survival during particularly difficult financial circumstances.

The estimated coefficient of TOP20 is positive which suggests a positive relationship between the percentage holdings of the top 20 shareholders of the company and failure risk. The estimated hazard ratio of TOP20 is 1.0370 which means that the financial distress risk of IPOs companies increases 3.70 percent for each percentage increase in the holdings of the top 20 shareholders. This result is consistent with the findings of Woo, Jeffrey and Lange (1995) who suggested that low ownership concentration is related to corporate longevity.

Considering financial ratios, DET is the only financial ratio which is statistically significant in explaining the survival of IPO firms. The parameter estimates are positive for DET, which means that the IPO companies with low debt ratio are less likely to fail. The estimated hazard ratio for DET is 1.973 which indicates that for every unit increase in debt ratio, the risk of failing increases by 97.3 percent.

For C_SIZE, the estimated coefficient is 0.7379. The positive sign of SIZE means that the larger the size of IPO companies, the higher the likelihood of companies entering into financial distress. This result is consistent with the findings of Lamberto and Rath (2008). A reasonable explanation for this result is that large companies might have inflexible organizations and have problems with monitoring managers and employees which leads to inefficient communication (Rommer, 2004) and subsequent failure.

The estimated hazard ratio for the variable VC_BACKED is 2.4520 which means that the hazard of financial distress for venture capital-backed IPO companies is about 245.20 percent of the hazard for non-venture capital-backed IPO companies. This result is contradictory to our expectations as the literature on venture capital-backed IPOs leads us to believe. Venture capital firms provide valuable certification and access to resources which should be valuable to VC-backed firms in times of distress as compared to companies without such backing. Our results resonate with that of Rosa, Velayuthen and Walter (2003) who do not find significant differences in the initial underpricing and long-run share performance between venture capital-backed and non-VC-backed Australian IPOs. It appears that mere backing by venture capitalists does not guarantee a high quality issue. An alternate explanation for the counterintuitive impact of the VC-backed variable is that venture capitalists tend to invest in risky ventures in hopes of achieving higher returns. Our results then imply that risky ventures have lower probability of survival.

The estimated hazard ratio for the BACK variable is 3.436 signifying that firms backed by underwriters are 3.436 times as likely to fail as compared to firms which are not underwriter backed. This counterintuitive result may be explained by the possibility that risky firms seek underwriter backing and that our proxy for risk does an inadequate job of controlling for firm level risk.

Summing up, the results of our study shows that new economy IPO companies with low ownership concentration, smaller value of total assets, low leverage and those that are

not VC-backed are more likely to survive. Interestingly, the principal recommendation that a majority of the board should be independent directors (Recommendation 2.1) is useful in reducing firm failure likelihood. Additionally, a larger board is associated with a lower chance of corporate failure.

Two of the three recommendations of ASX Corporate Governance Code do not help in mitigating the risk of corporate failure. These are: a) the chairperson should be an independent director (Recommendation 2.2) and b) the roles of chairperson and chief executive officer should not be exercised by the same individual (Recommendation 2.3).

The expected effect and the estimated effect of are summarized in Table 7. The table shows that only BD_SIZE, BD_INDP and DET have the expected signs while VC_BACKED and C_SIZE have exactly the opposite signs.

Table 7: Summary of estimated effects of variables on survival likelihood

Variable	Expected effect	Estimated effect
BD_SIZE	+	+
BD_INDP	+	+
BACK	+	-
TOP20	**Unclear**	+
VC_BACKED	+	-
DET	-	-
C_SIZE	+	-

4.3 IPO Companies Survival Probability Evaluation

The survival function, shown in Equation (1), which defines the survival probability, can be estimated from the model to identify the probability that a company will survive longer than *t* time units. The survival profiles of a typical non-survivor and survivor by survival time and by calendar year are presented in Figures 1 and 2 respectively.

The survival function shown in both figures is produced by averaging the estimated survival probability of companies by company status, viz., non-survivor and survivor companies. It can be inferred that the survival probabilities of typical failed IPO companies are lower than those of typical active IPO firms. Since the survival function denotes a company's probability of surviving past time *t*, it starts with 1.00 and declines as more companies fail. The graph shows that the survival probability of non-survivor companies is lower than the active companies and as time goes by, the survival probabilities for both start decreasing.

According to Figure 1, the dramatic decrease in survival probability for new economy non-survivor companies occurs at 7 years after IPO with a probability of 65.77 percent, then the survival probability increases slightly after year 8 and continuously drops after year 9. The non-survivor new economy IPO companies trade on the ASX for no longer than 10 years. For active or survivor companies, the noticeable decrease of survival probability occurs after 10 years since the companies going public with the probability of survival being around 71.47 percent. For non-survival companies, the survival probability that the companies will survive beyond 10 years after IPOs is around 54.63 percent.

Figure 2 shows that the probability of survival of non-survivor companies starts to drop steeply from 1998 until 2000 which coincides with the crash of new economy sector in April 2000. After this, the survival probability of these companies rose throughout 2001 and 2002. The dramatic drop of survival probability before 2000 could be interpreted cautiously in two ways: Firstly, the significant downturn in the market at the end of March 2000 (Johnston and Madura, 2002) influenced the low survival probability of typical new economy IPO companies. In other words, the survival probability of IPO companies could be affected by the abrupt weakening of the market. Secondly, these companies consist of the companies which have been listed for the few years before 2000, and the survival

probability of these companies declines over time. Consequently, the survival probability of average non-survival companies before 2000 decreases.

In addition, new economy active IPO companies experience low survival probability before the period of a diminished new economy sector. The survival probability at 1999 is approximately 96.73 percent. However, companies that could withstand the market decline were able to recover, and their survival probability slightly increases throughout 2000 to 97.99 percent.

It should be noted that the results for the years 2003 to 2007 are not comparable to the years 1994 to 2002 because no fresh IPO companies were included in the analysis after 2002. During the 2003 to 2007 period, the survival probability of non-survivor IPOs continuously declined to 54.78 percent in 2007.

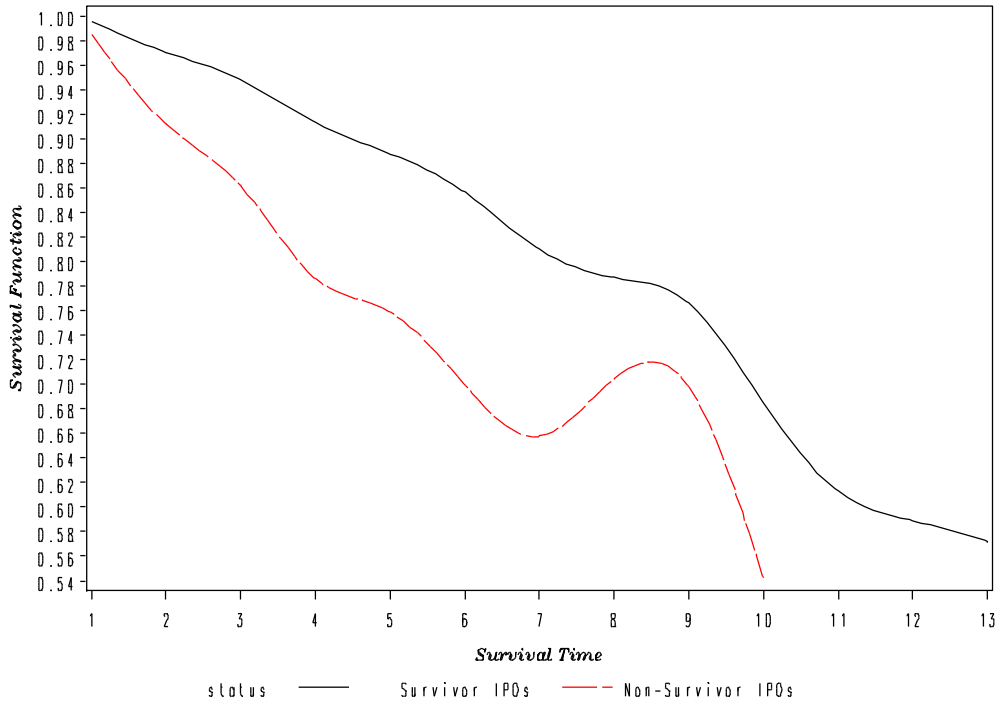

Figure 1: Graph of survival function versus survival time by company status

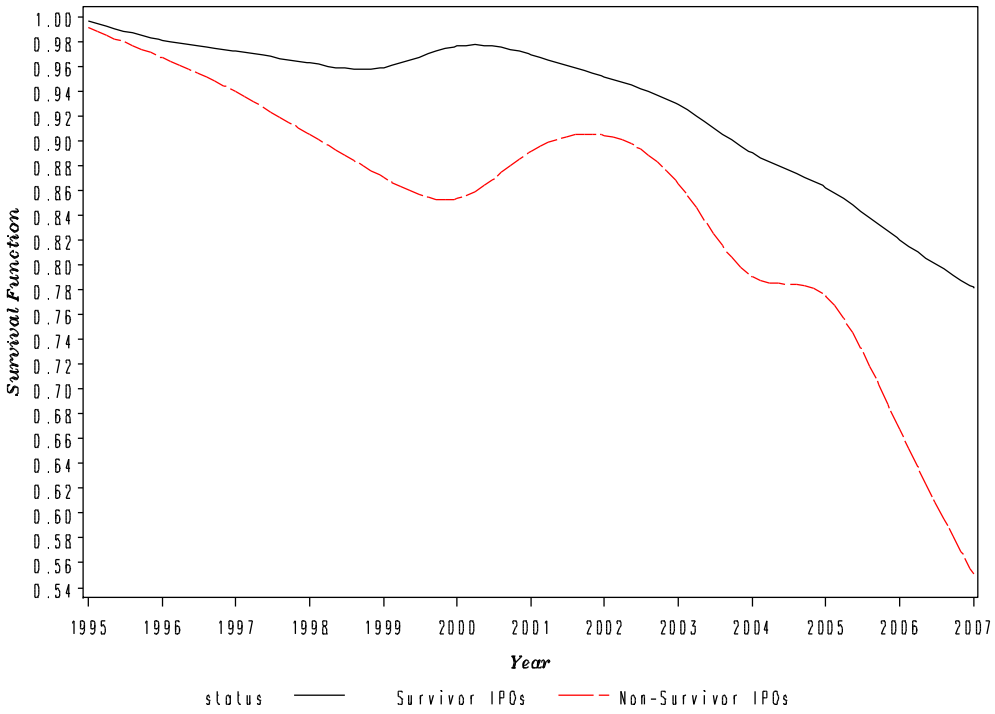

Figure 2: Graph of survival function versus calendar year by company status

5. Discussion and Conclusion

Our study explores the relationship between corporate governance attributes and the survival likelihood of new economy Australian IPO firms utilising the Cox proportional hazards model. We focus our attention on three main areas of corporate governance deemed to be most important by regulators and other market participants. These corporate governance mechanisms include board size, board independence, and dual leadership structure. Control variables such as offering characteristics, financial ratios and company specific variables are also incorporated in the model.

We find that board size, and board independence are both associated with a higher probability of survival of new economy IPO firms. However, other recommendations such as a) chairperson should be an independent director and b) the roles of chairperson and chief executive officer should not be exercised by the same individual have no impact on the survival of new economy IPOs.

Our results indicate that the ownership concentration is negatively related to new economy IPO firms' survival. This contradicts the tenets of agency theory which suggests that a firm is more likely to survive if ownership concentration is high. This is because shareholders with significant holdings are more likely to have an influence on management's decisions and they will expend more monitoring costs as their stake in the firm increases (Jensen and Meckling, 1976). Our results are consistent with Woo, Jeffrey and Lange (1995). They argue that lower ownership concentration, where stock of the firm is more widely held, could facilitate more effective capital raisings from a wider investment group, which makes the company less likely to fail.

Conventional wisdom that "smart money" is associated with superior performance does not seem to hold here. In the aftermath of the internet shakeout, sophisticated investors were as clueless as naïve investors. This is also shown by the weak evidence indicating that VC-backing is associated with higher likelihood of failure. In fact, "dumb" investors seem to have done better than their smart counterparts. An alternate explanation for our finding is that VC-backing is proxying for risk. Thus our findings are consistent with the notion that risky firms are more likely to fail.

Our results also suggest that new economy IPO companies with small company size and low leverage are more likely to survive. The finding that low leverage is associated with greater survival likelihood is consistent with conventional wisdom. It is not clear why small size firms are more likely to succeed.

Further analysis on the characteristics of boards including information on the experience of directors in the particular industry sector, the number of meetings held by the boards, and board remuneration are likely to be fruitful. It is also possible that human capital attributes of the board and senior executives play a role in the survival of new economy firms. More research on this key issue is likely to enhance our knowledge of the factors influencing corporate survival.

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