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TMT Characteristics, Time-to-IPO and Firm Performance *

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Abstract

We explore the influences of the demographic characteristics of a firm's top management team (TMT) on the time it takes to complete an initial public offering (time-to-IPO), and the consequences of this decision for the firm's performance. Using data from pre-packaged software industry firms that completed IPOs between 1993 and 1997, we find TMT age, tenure, size, and tenure heterogeneity all increase time-to-IPO. While time-to-IPO has no direct effect on firm performance, it moderates some of the relationship between TMT characteristics and firm performance.

Key words: TMT characteristics, Firm performance, Time-to-IPO, Moderating role

Introduction

There are good reasons for a firm's top managers and investors to complete an IPO early in the life of the firm. For instance, they may be motivated to complete an IPO by the desire to improve the firm's reputation, create a currency for acquisitions, or mobilize capital for supporting growth (Brau and Fawcett, 2006). An IPO is considered by many to be an achievement and/or a performance milestone for a new firm and an indicator that it is primed for growth (Chang, 2004). An IPO provides an opportunity for founders and investors to "cash out" and be compensated for shouldering considerable risk during

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the formative stages of a firm (Pagano, *et al.*, 1998). In addition, firm capitalists and other investors, seeking to increase the “real” rate of return on their investment, may prefer that a firm complete an IPO sooner rather than later (Shepherd and Zacharakis, 2001, p. 59).

On the other hand, there are equally good reasons for top managers and investors to delay an IPO to the greatest extent possible. The change from private to public ownership is a significant transformational event and may expose the firm again to the liabilities of newness (Fischer and Pollock, 2004). Indeed, research has shown that a significant number of firms under-perform the market or fail within three to five years after their IPOs (Fischer and Pollock, 2004; Jain and Kini, 2000; Ritter, 1984). As such, managers may elect to take time to learn and build their human resources, systems, and operations, as well as build market share so that the firm can withstand the intense scrutiny and demands of operating as a public company.

It is this dilemma that Jovanovic and Rousseau (2001) attempted to solve, when they raised the question “Why wait?” in their paper analyzing the time firms have taken to complete their initial public offerings (IPOs). They suggested that the answer to this question may depend on the trade-off that the firm’s top managers make between incurring the opportunity cost of waiting, and taking the time to learn about their technologies, products and markets (Clark, 2002).

The choice of when to go public is an important one for a firm’s legitimacy, immediate resource needs, and future performance. A number of studies have explored the implications of time-to-IPO, i.e., the time elapsed between firm founding and completion of its IPO. Many studies have considered time-to-IPO as an outcome or performance measure in relationship to firm characteristics including industry (Giot and Schwiendbacher, 2007; Shepherd and Zakarakis, 2001), geographic location (Shepherd and Zakarakis, 2001), location near rivals (Stuart and Sorenson, 2003), the reputation of firm capital firms investing in the firm and that of the firm’s alliance partners (Chang, 2004), and the breadth of experience of the founding team (Beckman and Burton, 2008). Other studies have used time-to-IPO – typically termed “firm age” or “firm age at IPO” – as a variable with the potential to influence either firm outcomes at IPO, such as under-pricing (e.g., Ritter, 1998), or the firm’s post-IPO market performance or survival (e.g., Fischer and Pollock, 2004; Higgins and Gulati, 2006; Jain and Kini, 2008).

In this study, we focus specifically on the influences of the demographic characteristics of a firm’s top management team (TMT) – a set of variables that decidedly influences the firm’s early development and subsequent evolution – on its time-to-IPO and performance. For the firm, the time between founding and IPO (i.e., time-to-IPO) may provide an opportunity for learning and preparation in advance of the IPO. The effect that TMT characteristics have on firm performance may well be influenced by the time-to-IPO, i.e. the firm’s time-to-IPO also may moderate the relationship between TMT characteristics and firm performance. Accordingly, we examine three related issues: (1) the direct influence of the demographic characteristics of the firm’s TMT on its time-to-IPO and firm performance; (2) the direct effect of time-to-IPO on the firm’s performance; and (3) the potential role of time-to-IPO as a moderator in the relationships between TMT characteristics and the firm’s performance.

Our study contributes to the literature by providing a more comprehensive understanding of the relationships among TMT characteristics, time to IPO, and firm performance. Specifically, we build on literature that views the TMT as a valuable source of human and social capital based on the team members’ knowledge and experience (e.g. Carpenter, *et al.*, 2004; Hambrick and Mason, 1984; Hitt, *et al.*, 2001). Our study contributes to the literature by testing the value that additional time elapsed between startup and IPO might afford a firm to learn and prepare for the increased complexity of life as

a public company and so enhance its performance. Our study also makes potentially valuable practical contributions. In particular, our findings pertaining to the performance implications of time-to-IPO will be of interest to entrepreneurs, executives of new firms, and firm capitalists alike.

The remainder of our paper is organized as follows. We begin with a review of literature on TMT characteristics, time-to-IPO, and firm performance. We present a theoretical model relating TMT characteristics to time to IPO and firm performance, and the moderating role of time-to-IPO. Next, we describe our data and methods. We then present the results of our analysis. Finally, we discuss our results and conclude with ideas for future research.

Theoretical Background and Hypotheses

The examination of the link between TMT demographic characteristics, as proxies for the underlying traits, capabilities, and processes of the team, and firm outcomes enjoys a long tradition in the strategy literature (for recent reviews, see Carpenter, *et al.*, 2004; Hambrick, 2007). TMT knowledge and experience, in particular, are viewed as important resources in terms of human and social capital because they afford the firm direct and indirect access to valuable knowledge and information (Fischer and Pollock, 2004; Hitt, *et al.*, 2001; Pfeffer, 1994). As Hambrick (2007) notes, there is considerable evidence that TMT characteristics influence a variety of firm behaviors and outcomes. Past research has shown that TMT demographic heterogeneity significantly influences the propensity for change (e.g., Grimm and Smith, 1991; Wiersema and Bantel, 1992) and firm outcomes such as firm performance (Glick, *et al.*, 1993; Hambrick, *et al.*, 1996; Kilduff, *et al.*, 2000; Simons, *et al.*, 1999). In the entrepreneurship literature as well, TMT demographic characteristics are routinely identified as proxies for other variables that potentially influence firm strategy and performance (e.g., Certo, *et al.*, 2009; Cooper and Bruno, 1977; Daily, *et al.*, 2003; Eisenhardt and Schoonhoven, 1990; Gilbert, *et al.*, 2006; Weinzimmer, 1997; Zimmerman, 2008).

Figure 1 offers a preview of our theoretical model. In the remainder of this section, we use pertinent literature to develop our hypotheses on the relationships among the firm's TMT characteristics, time-to-IPO and short-term and long-term performance.

TMT age, Time-to-IPO and Firm performance

One frequently studied TMT demographic characteristics is age. Hambrick and Mason (1984) argued that age is related to status quo and the willingness to accept change. According to Vroom and Pahl (1971), older manager are more risk-averse than younger manager, and Pegels and Yang (2000) noted that younger managers seek strategic change. Yang, *et al.* (2011) found that the age of a specific member of the TMT, the CEO, is positively related to a firm's time to IPO. They argued that because going public is a complex strategic change for a firm, younger CEOs are more likely to take a company public earlier in a firm's life than older CEOs.

TMT age has been positively associated with higher levels of experience (Sandberg and Hofer, 1987; Sapienza and Grimm, 1997). Higher levels of experience, a critical attribute associated with human capital, can potentially increase the capacity of the TMT to combine existing knowledge and resources productively (Hitt, *et al.*, 2001). Higher levels of experience can also increase confidence and self-efficacy, i.e., the belief that one can successfully accomplish a task (Bandura, 1997).

Additionally, the age of TMT members has been used in TMT research as a proxy for networks and affiliations (e.g., Richard and Shelor, 2002) and, more generally, social capital. Social capital enables TMTs to have access to sources of valuable information and knowledge outside of the firm (Fischer and

Pollock, 2004). From this perspective, older TMTs are likely to have stronger ties to individuals and organizations which can provide legitimacy to the firm.

These positive aspects of age suggest that, all else being equal, older TMTs may be able to weigh the pros and cons of completing an IPO earlier versus later, may be more inclined to avoid risky decisions than their younger counterparts (Miller and Shamsie, 2001; Vroom and Pahl, 1971) and, thereby, avoid the risk of a failed IPO (Ling, *et al.*, 2008). Furthermore, they are likely to take as much time as needed to develop the organizational capabilities to position the firm to perform well, rather than acting hastily to complete an IPO too early in the life of the firm. Accordingly, we hypothesize:

H1a: *TMT age is positively related to a firm's time-to-IPO.*

H1b: *TMT age is positively related to a firm's performance.*

TMT tenure, Time-to-IPO and Firm performance

TMT tenure, the duration of time during which members have been part of the firm's TMT, is an important characteristic (Pfeffer, 1981) that offers insight into the behavior of TMTs on issues related to strategic change (Boeker, 1997; Wiersema and Bantel, 1992). Long-tenured TMT members form cohesive networks with other members and develop a unique pattern of interactions (Fischer and Pollock, 2004). With time, the TMT members may accumulate deep firm-specific knowledge, and discern the value of their respective competences. Furthermore, team members with relatively long tenure may perceive a high level of personal "investment" in the firm. All of these considerations may enable them to develop a "collective mindset" and a common perspective of the firm, thereby resulting in TMT cohesion, consistent decisions and consistent behaviors (Hambrick and Mason, 1984).

While there are benefits to having a long-tenured TMT, Finkelstein and Hambrick (1990, p. 486) reported, "...firms led by long-tenured executives will tend to have (1) persistent, unchanging strategies, (2) strategies that conform closely to industry averages, and (3) performance that conforms to industry averages." Therefore, long-tenured TMTs may be associated with risk averseness and a strong commitment to a course of action, which may compromise the ability of the firm to change course and adapt as necessary. In the case of an IPO, a long-tenured team may delay the firm's IPO and also negatively influence the firm's performance. Based on the above arguments, we hypothesize as follows:

H2a: *TMT tenure is positively related to a firm's time-to-IPO.*

H2b: *TMT tenure is negatively related to a firm's performance.*

TMT size, Time-to-IPO and Firm performance

TMT size is another frequently studied TMT characteristic. A large TMT means that more resources are available to the firm (Hambrick and D'Aveni, 1992), and more information can be processed and brought to bear on problems, thereby resulting in potentially better decisions (Cummings, *et al.*, 1974; Haleblian and Finkelstein, 1993). Several entrepreneurship studies have found that a larger TMT contributed to more effective problem solving and firm performance compared to smaller TMTs (Cooper and Bruno, 1977; Eisenhardt and Schoonhoven, 1990; Song, *et al.*, 2008).

Large TMTs, however, tend to experience higher transactions costs, more coordination problems, and more disagreements than small TMTs (Bruderl, *et al.*, 1992; Gilbert, *et al.*, 2006; Koeller and Lechler, 2006) and may take longer to make decisions (Thomas and Fink, 1963). In the context of a firm considering an IPO, TMT size may affect the decision to go public. Large TMTs may take more time to decide to go public. In addition, the resources of a large TMT may also enable the firm to make better decisions and position the firm for long-term success. Accordingly, we hypothesize:

H3a: *TMT size is positively related to a firm's time-to-IPO.*

H3b: *TMT size is positively related to a firm's performance.*

TMT age heterogeneity, Time-to-IPO and Firm performance

There is extensive literature examining the heterogeneity of the TMT (Zimmerman, 2008). One form of heterogeneity frequently studied is age heterogeneity. TMT age heterogeneity results from differences in the respective ages of team members. If age is a proxy for perspectives, belief systems, networks and affiliations (Richard and Shelor, 2002), heterogeneity in age implies access to a broader set of perspectives and information (Williams and O'Reilly, 1998) and potentially more creativity in addressing strategic issues (Richard and Shelor, 2002; Wiersema and Bantel, 1992). Indeed, greater TMT age heterogeneity has been linked to better firm performance (Kilduff, *et al.*, 2000; Richard and Shelor, 2002; Wiersema and Bantel, 1992).

While there are many positive aspects to age heterogeneity, there are negative consequences. For instance, age heterogeneity may result in conflict, and conflict may lead to poor decision processes (Amason, 1996; Jehn, 1995; Jehn, *et al.*, 1999), slower decisions, (Miller, *et al.*, 1998) and lower propensity to respond to competitors (Hambrick, *et al.*, 1996). In the context of an IPO, such conflicts may delay the decision to take the company public and/or the IPO event. However, the potential for more creativity and better decision-making due to age heterogeneity may positively influence firm performance. Accordingly, we hypothesize:

H4a: *TMT age heterogeneity is positively related to a firm's time-to-IPO.*

H4b: *TMT age heterogeneity is positively related to a firm's performance.*

TMT tenure heterogeneity, Time-to-IPO and Firm performance

A second form of TMT heterogeneity is that of the team members' tenure. Heterogeneity in TMT tenure implies that TMT members were hired at different times. Some members may be founders of the firm while others are recruited to bring in skills and experience critical to strategic flexibility and emergent demands as the firm prepared for the IPO event and life as a public company (Bantel and Jackson, 1989; Certo, 2003; Wiersema and Bantel, 1992; Zimmerman, 2008). Tenure heterogeneity within the TMT has been found to benefit firm performance and strategic change (Hambrick, *et al.*, 1996; Murray, 1989; Wiersema and Bantel, 1992).

Negative aspects of TMT tenure heterogeneity include greater cognitive rigidity and commitment to the status quo, less social integration, higher turnover, and poorer communication than groups with less heterogeneity (Bantel and Jackson, 1989; Williams and O'Reilly, 1998). Bantel (1993) argued that teams with higher tenure *homogeneity* form a cohort that influences consensus and is positively related to reaching a consensus in a strategic decision.

As in the case of age heterogeneity, tenure heterogeneity may lead to conflicting perspectives and slower decisions. In the context of an IPO, tenure heterogeneity may delay the IPO event, but positively influence firm performance. Accordingly, we hypothesize:

H5a: *TMT tenure heterogeneity is positively related to a firm's time-to-IPO.*

H5b: *TMT tenure heterogeneity is positively related to a firm's performance.*

TMT functional heterogeneity, Time-to-IPO and Firm performance

A third frequently studied form of TMT heterogeneity is that of functional heterogeneity. Top managers are thought to have a generalist's perspective (Hambrick and Mason, 1984), many top

managers have a functional specialization (Gupta, 1984). Hambrick and Mason (1984) argued that a top manager's functional experience provides a functional orientation that influences decisions. In new firms, the founding team members were found to have emphasized the functional areas in which they were experienced (Boeker, 1988). Researchers have argued that greater heterogeneity in the functional backgrounds of team members increases variety in the environmental scanning alternatives and effective decision making, influences competitive action and response, leads to creativity and innovation, influences strategic decision making, and improves firm performance (Bantel and Jackson, 1989; Glick, *et al.*, 1993; Hambrick and Mason, 1984; Hambrick, *et al.*, 1996; Lant, *et al.*, 1992; Murray, 1989; Roure and Keeley, 1990; Weinzimmer, 1997; Williams and O'Reilly, 1998; Zimmerman, 2008).

Eisenhardt and Schoonhoven (1990) found a TMT with more functional heterogeneity can better address strategic opportunities and better enable the firm to grow. In new firms Ensley *et al.* (1998), however, found TMT functional background heterogeneity was negatively related to revenue generated. A team experienced across functional areas (e.g., finance, human resources, marketing, operations, engineering) enables the firm to respond to challenges and opportunities more effectively than a team focused in one functional area (e.g., engineering). Heterogeneity in the top managers' functional background provides a signal to investors about the quality of an IPO firm, and firms with a management team with greater functional background heterogeneity raised more money at IPO than those with a less heterogeneous team (Zimmerman, 2008).

As in the case of age and tenure heterogeneity, we anticipate that functional heterogeneity may lead to conflicting perspectives and slower decisions. In the context of an IPO, tenure heterogeneity may delay the IPO event, but positively influence firm performance. Accordingly, we hypothesize:

H6a: *TMT functional heterogeneity is negatively related to a firm's time-to-IPO.*

H6b: *TMT functional heterogeneity is positively related to a firm's performance.*

Time-to-IPO and Firm Performance

In the IPO literature, studies have used firm age as a measure of risk and generally found a positive relationship between firm age and firm performance, presumably due to the reduction in uncertainty associated with the firm (Daily, *et al.*, 2003; Hoskisson, *et al.*, 1994; Mikkelsen, *et al.*, 1997). From a learning theory perspective, this result appears reasonable. Learning theory maintains that a firm learns when it acquires useful information (Huber, 1991). Accordingly, a firm's time-to-IPO, all else being equal, may be an indicator of the extent to which the TMT has had time to acquire useful information pertaining to this event and the future, and prepare for the anticipated future. For instance, given more time, a firm is more likely to have searched and acquired information to increase its competitive advantage, build a track-record, staff various critical functions, and put in place appropriate organizational structures, processes and governance mechanisms. Firms that are in existence for longer periods of time prior to undertaking an IPO have more time to develop and enhance their competitive position, staffing, capabilities, slack resources and track-record of performance. Shepherd and Zakarakis (2001) found that firm-capital-backed high-technology firms took a longer time to complete their IPO than non-technology firms and speculated that this might be because high-technology firms take longer to develop. Thus, from a learning theory perspective, a longer time-to-IPO will enable TMTs to acquire knowledge and information that can prove to be beneficial to firm performance.

All other things being equal, a shorter time-to-IPO might mean that the firm is not yet "ready" for IPO and may be lacking in legitimacy. Such a firm is more likely to disappoint the stock market after the initial exuberance subsides and compromise its very legitimacy. Absent legitimacy, the firm's ability to attract relevant resources, build new capabilities or renew existing ones, and sustain its long-term

performance as a public firm would be limited severely. Its very survival would be in doubt, as indicated by strong findings that a significant proportion of firms tended to under-perform the market and failed subsequent to their IPOs (Certo, *et al.*, 2009; Ritter, 1998). Accordingly, we contend that the longer a firm takes to complete IPO, the better would be its post-IPO performance:

H7: *Time-to-IPO is positively related to firm's performance*

Time-to-IPO as a Potential Moderator

In a comprehensive review of the so-called upper-echelon theory, Carpenter, *et al.*, (2004: 750) summarized, "the underlying (upper echelon) framework is a linear one – the situation (faced by the firm) is enacted by the TMT, enactment leads to strategic choices, and those choices affect (firm) performance. The linkages connecting the situation directly to (upper echelon) characteristics and strategic choices are never explicitly addressed ..." Additionally, in their meta-analysis of prior research on IPO underpricing, Daily, *et al.*, (2003) examined research studies on IPO underpricing and suggested the possibility that there may be as-yet unexplored moderating influences at work.

One such potential moderating influence on the relationship between TMT characteristics and firm performance may be that of the time-to-IPO. Time-to-IPO is akin to a resource. It affords TMTs opportunity to learn technology, product and markets, and prepare the firm to operate as a public entity. The time-to-IPO can supplement the human and social capital and resources that firm already has. The time-to-IPO in conjunction with the other capital and resources available to the firm can make a difference to firm performance. But not all firms may need the time-to-IPO nor can benefit from it evenly. Certain TMTs may actually benefit from wide window of time available and certain other TMTs may be challenged by a rather narrow window of time. For example, relatively young TMTs may actually benefit from long time-to-IPO, as it gives the TMT time to learn and it may result in high firm performance; in contrast, short time-to-IPO may challenge relatively young TMTs and it may hurt firm performance. Along the same lines as the above, relatively large TMTs may not need much time to learn and complete IPO; nonetheless their firm performance can get a boost from a wide window of time. TMTs with long tenured members, taking a long institutional view of the firm, might choose to take a long ramp to complete IPO and profit from it. Whereas, TMTs with relatively short tenured members might take a different ramp with different firm performance consequences. In other words, the time-to-IPO and TMT characteristics interact and jointly influence firm performance. Accordingly, we hypothesize:

H8: *Time-to-IPO of a firm moderates the relationships between TMT demographic characteristics and firm performance.*

Data and Methodology

To test our hypotheses, we analyzed a sample of firms in the pre-packaged software industry (SIC code 7372) that completed their IPO during the period of January 1, 1993 through December 31, 1997. Researching a single industry has the methodological advantage of isolating industry effects from confounding relationships between the independent and dependent variables (Dess, *et al.*, 1990). The pre-packaged software industry was selected because a large number of firms in this space completed their IPO during a period of significant IPO activity preceding the dot-com bubble. According to the IPO Reporter and IPO Data, 243 US based software firms completed their IPOs during the period between January 1, 1993 and December 31, 1997.

The primary data source for the study was the prospectus issued at the time of IPO by the firms. We were able to obtain IPO prospectuses for 172 of the 243 firms. Nevertheless, our sample was representative of the population of pre-packaged software firms that completed their IPO between

1993 and 1997. The average IPO value of the population was \$30.6 million and the average IPO value of firms in our sample was \$32.7 million.

For each of the firms, we collected the following data:

Dependent Variables

Time-to-IPO. Time-to-IPO was measured as the time (in years) elapsed from a firm's date of incorporation to the date of the IPO.

Firm performance. Capital raised at the time of IPO is a measure of the market value of the firm at the time of its IPO (Deeds, *et al.*, 2004; Finkle, 1998). In this study, we calculated the net proceeds received by the firm from the IPO as the capital raised through the IPO less the underwriters' fees, as reported in the firm's prospectus.

Independent Variables

For the purposes of this study, the TMT comprised the individuals listed in the prospectus as the management team (Shrader, *et al.*, 2000). This includes all of the top officers and the key decision makers of the company such as the Chief Executive Officer, Chief Financial Officer, Chief Operating Officer, as well as all the managers listed in the management section of the IPO prospectus (Murray, 1989). Data on TMT demographic characteristics and heterogeneity were collected from the biographies of the members in the IPO prospectus and S1 and SB-2 filings at the SEC.

TMT age was calculated as the average age of the individual TMT members.

TMT size was calculated as the number of members in the firm's TMT.

TMT tenure was measured using the average time in years between an individual TMT member's hire date and the IPO date. A lower number indicates that the team has been put together close to the date of IPO, and a higher number indicates that the team was put in place earlier in the life cycle of the firm.

TMT age heterogeneity. Age heterogeneity was computed as the coefficient of variation of the team members' age (Murray, 1989; Richard and Shelor, 2002), where a high score indicates age heterogeneity and a low score indicates lack of age heterogeneity.

TMT tenure heterogeneity. Tenure heterogeneity was calculated as the coefficient of variation of the top managers' tenure (Murray, 1989), where a high score indicates tenure heterogeneity and low score indicates lack of tenure heterogeneity.

TMT functional heterogeneity. Functional heterogeneity was calculated using Blau's (1977) heterogeneity index ($1 - \sum i^2$), where i is the proportion of TMT in members with background in a given functional area, e.g., finance, human resources, general management, marketing, operations, R&D, information technology, and legal (see Boeker, 1988; Tihanyi *et al.*, 2000; Zimmerman, 2008). A high score indicates a high level of heterogeneity in the functional backgrounds of team members, whereas a low score indicates a lack of functional heterogeneity.

Control Variables

To control for the effects, if any, of the IPO market environment and other aspects of the firm itself on its performance, we treated the following as control variables:

IPO year. The period covered by the study (1993-1997) witnessed varying capital market conditions, with 1993 and 1996 being regarded as “hot markets” for IPO (Zimmerman, 2008). To control for the effects of these varying conditions on IPO activity, we created the following dummy variables IPOyear1993, IPOyear1994, IPOyear1995 and IPOyear1996. If a firm completed its IPO in 1995, the IPOyear1995 dummy will have a value 1 and all other IPOyear dummy variables will have value 0.

VC equity. Past research has demonstrated the critical role played by VC support in ensuring that a firm raises sufficient capital through an IPO (e.g., Brav and Gompers, 1997; Chang, 2004; Gompers, 1995; Gulati and Higgins, 2003). We measured VC involvement as the percentage of equity held by VCs, as declared in the firm’s IPO prospectus.

Underwriter reputation. Past research has shown that the reputation of the lead underwriter influences the capital raised by the firm through an IPO (Beatty and Ritter, 1986; Gulati and Higgins, 2003; Lange, *et al.*, 2001). We measured underwriter reputation using the index created by Carter, *et al.* (1998). A value of 0 denotes the lowest reputation, whereas a value of 9 denotes the highest reputation.

In addition, we used two variables to control for the prior performance of firms:

Net income during prior year was measured as the net income declared by the firm for the full financial year immediately preceding the IPO date.

Book value of equity during prior year was measured as the book value of equity declared by the firm for the full financial year immediately preceding the IPO date. The book value of equity can be either a positive or a negative value, depending on whether the firm has accumulated retained earnings or losses during its lifespan prior to the IPO. Accordingly, it can serve as a cumulative or summary record of firm performance.

Data Analysis

Descriptive statistics and bivariate correlations are presented in Table I.

To test the relationships between TMT variables and the time-to-IPO, we completed a regression model treating time-to-IPO as the dependent variable and the TMT variables and the control variables as the independents. Next, to test the relationships between TMT variables and firm performance, we completed a regression model treating firm performance as the dependent variable and TMT variables and control variables as the independents. To test the relationship between TMT variables, time-to-IPO and firm performance, we completed a regression model with firm performance as a dependent variable and TMT variables, time-to-IPO and the control variables as the independent variables. Finally, to test moderating influence of time-to-IPO on the relationships between TMT variables and firm performance, we completed a regression model treating firm performance as the dependent variable, time-to-IPO, TMT variables and control variables, cross-product of time-to-IPO and TMT variable as the independent variables. We introduced one cross-product term at a time in the model and analyzed only those interaction terms that had significant effect on firm performance. To minimize the concerns arising from multi-collinearity, we centered all variables around their respective means. The highest Variance Inflation Factor (VIF) for variables in our models was 3.60; it was significantly less than the typically recommended cut-off value of 10. The results are presented in Table II.

Study Results

TMT Characteristics and Time-to-IPO: According to the regression results presented in Model 2a (Table II), TMT age did have a positive and significant effect on time-to-IPO, supporting Hypothesis H1a ($\beta=$

0.12; $p < 0.05$). TMT average tenure had a positive and significant effect on time-to-IPO ($\beta = 0.68$; $p < 0.01$) in support of hypothesis H2a. TMT size had a positive and significant effect on time-to-IPO ($\beta = 0.15$; $p < 0.05$), lending support to hypothesis H3a. TMT age heterogeneity had no significant effect on time-to-IPO, failing to support hypothesis H4a. TMT tenure heterogeneity had a significant and positive effect on time-to-IPO ($\beta = 0.26$; $p < 0.01$). This result supports hypothesis H5a. And, TMT's functional heterogeneity had no significant effect on time-to-IPO. We did not find support for hypothesis H6a.

TMT Characteristics and Firm Performance: Results from Model 2b (Table II) show that TMT size had a significant and positive effect on firm performance ($\beta = 0.18$; $p < 0.05$), supporting our hypothesis H3b. Also, from Model 2b (Table II), results show that TMT's functional heterogeneity had a significant and positive effect on firm performance ($\beta = 0.13$; $p < 0.10$), lending support to hypothesis H6b.

Time-to-IPO and Firm performance: The results from Model 2c (Table II) also show that time-to-IPO had no effect on firm performance. The result indicated no support for hypothesis H7 in which we argued that time-to-IPO would have direct and positive relationship with firm performance.

Moderating role of Time-to-IPO: With respect to hypothesis H8 in which we predicted that time-to-IPO would moderate the relationships between TMT characteristics and firm performance, results presented in Models 2d and 2e (Table II) show the following: time-to-IPO and TMT size jointly effect firm performance ($\beta = 0.18$; $p < 0.05$). Also, time-to-IPO and TMT's functional heterogeneity jointly determine firm performance ($\beta = 0.18$; $p < 0.01$). In these two respects hypothesis H8 found support.

Discussion

We started with the premise that a question that firms seeking to do IPO face is: "how long do we wait to do an IPO?" The answer, in part, is that it is a matter of choice – a choice that is made by TMT. The results presented in this paper affirm that TMT characteristics determine the time-to-IPO and TMT characteristics and time-to-IPO jointly effect firm performance. Some TMTs may need more time to prepare the firm to face the changes associated with transformation from a private enterprise to a public firm and manage the attendant risks. The pre-IPO process involves learning – learning on the part of the TMT members and this goes beyond technology related matters; and it involves willingness to make trade-offs with revenue and profit from any delays. This was the trade-off that Jovanovic and Rousseau (2001) and Clark (2002) posited. The results presented in this paper contribute to our understanding of the behavior of firms in matters related to a major milestone, viz., IPO, specifically, time-to-IPO, its determinants and firm performance consequences.

The positive relationship we found between TMT's age and time-to-IPO suggests that TMTs with relatively old members, who may be heavy on human and social capital, seemed to rely on the capital and take a long ramp to learn all that it takes to complete their IPO. And by the same arguments situations that present relatively short calendar to do an IPO can be challenging contexts for relatively young TMTs. In part, this study is about early TMTs, specifically, early TMTs that were in place at IPO. Beckman, *et al.*, (2007) tracked TMT membership changes, i.e., entrances and exits, which had occurred in "early teams" of 161 firms in multiple industries. Their findings showed that human capital, e.g., functional diversity, and social capital, e.g., background diversity in terms of the number of firms previously associated with, were positively related to the likelihood of their firms reaching major milestones, e.g., completing a successful IPO. Results presented in this paper add depth to the findings of Beckman, *et al.* (2007) in that TMT team tenure was positively related to time-to-IPO. Long tenured teams can be thought of as comprising members who were present at "creation," have a "vision," and

have firm-specific knowledge of the firm. These qualities seemed to have a positive effect on the time-to-IPO.

Doing an IPO is about strategic change and restructuring. Learning to initiate and successfully complete the changes can be critical to the success of new public firms. Findings presented in this paper with respect to TMT group heterogeneity lend further support to the findings of Wiersema and Bantel (1992) who showed that firms with long tenured teams were more likely to engage in corporate strategy changes. The results presented in this paper extend the work done by Wiersema and Bantel (1992) to new firms and to decisions related to IPO. Going public is a risky event for the firm: Hambrick and Mason (1984), Vroom and Pahl (1971), among others, have argued that older TMTs tend to be risk-averse than younger TMTs and favor *status quo*. Along the same as the above, Yang, *et al.* (2011) found that relatively old CEOs are more likely to complete IPO later than sooner. Our results reinforce these prior findings.

The time cycle over which TMTs have come together, namely in a short hiring cycle or rather long hiring cycle, as reflected in TMT's tenure heterogeneity, also seemed to matter. Each new addition to the TMT tends to bring on board a member with a different frame of reference. Such additions to TMT seemed to make a difference. A story line that emerges from our results is: time-to-IPO *per se* does not make a difference to firm performance. In the sample of pre-packaged software firms examined in the study, firms that completed their IPO relatively early or rather late reported about same performance (as measured by the amount of capital raised). From the standpoint of the TMT, the order in which firms enter the capital market did not matter. One take-away for firms seeking to do an IPO: "Take your time, do your homework, prepare the firm for a successful IPO, and know that TMT characteristics matter more than being competing to do IPO first."

Then should the TMT do an IPO sooner, rather than later? That depends on the characteristics of the TMT that is in place. The time-to-IPO and the TMT characteristics, specifically, TMT size and TMT's functional heterogeneity, seemed to jointly have an effect on firm performance. The time-to-IPO provides the context in which the effects of TMT characteristics on firm performance are better understood: Moderating role of the time-to-IPO graphed in Figures 2a and 2b suggest the following: Firms with large TMTs reported higher performance than firms with small TMTs. Apparently, the more members in the TMT, the greater were the resources at hand, the greater were the opportunities to learn from each other, and the merrier it was with respect to firm performance! Relatively long calendar to complete an IPO seemed to provide further lift to the effect of TMT size on firm performance. (see Figures 2a and 2b)

Likewise, with TMT tenure, results presented in Figure 2b suggest the following: TMT tenure and time-to-IPO jointly determine firm performance. When IPO calendar is relatively short, firms with relatively short tenured TMTs outperform firms with long tenured TMTs. In contrast to this, when IPO calendar is relatively long, firms with long tenured TMTs outperform the firms with short tenured TMTs. A possible explanation is: TMTs are often engineered with a mission in mind – short tenured TMTs, i.e., TMT members are hired in a short order of time, are engineered with a mission to take the firm public as soon as possible and the firms indeed do outperform when the IPO ramp is rather short; long tenured teams, i.e., TMT members are hired a long period of time, are engineered rather deliberately and slowly, and firms do much better when the TMTs take relatively long time to complete IPO.

The moderator model that we proposed and tested in this paper sheds more light on the suggestion that Daily *et al.*, (2003) made on the possibility that there may be unidentified moderating influences on the performance of new firms. Specifically, the results presented in this paper identified time-to-IPO as a

moderator. There may be numerous other moderator variables as well. Nonetheless the findings add depth to the genre of studies that looked at the so-called intermediate decision and process related issues by adding time-to-IPO as yet another decision.

Our study has a couple of limitations. First, according to our hypotheses, TMT characteristics influence the time-to-IPO as well as firm performance. Our theory raises concerns related to endogeneity. Therefore, in addition to the OLS models and the results presented in Table II, we estimated a two-stage model of firm performance. First, we estimated time-to-IPO as a function of TMT variables and control variables (i.e., Model 2a) and, in the second stage, we regressed firm performance on control variables and the predicted values of time-to-IPO from the first stage model (i.e., Model 2a). We found that time-to-IPO was positively and significantly ($p < 0.05$) related to firm performance (results available with authors). However, it was not possible for us to include TMT variables or interaction terms in this model due to significant multi-collinearity. Therefore, we were not able to estimate an endogenous model. Second, we note that our study was based on a sample of firms in one industry, viz., pre-packaged software industry. As the pre-IPO learning process and, consequently, the time-to-IPO tend vary significantly from industry to industry, we suggest caution in extending the conclusions of our study to other industries.

Conclusion

In this study, using a sample of technology firms in the pre-packaged software industry that completed their IPO during the mid-1990s, we explored how a firm's TMT demographics and heterogeneity influenced its time-to-IPO and its performance. Our analysis revealed the key influences of TMT age, size, TMT tenure and TMT functional heterogeneity on the time a firm takes to complete its IPO. Finally, we found that a firm's time-to-IPO moderates the relationships between several TMT characteristics and firm performance. Though our results increase our understanding of antecedents and consequences of the time it takes for a firm to go public, they still do not open the "black box" of the going-public decision. Accordingly, we identify three distinct and related issues for future research. These are implicitly referred to in the literature on IPO and alluded to in this paper.

The first one focuses on a firm's readiness to do an IPO. Is it possible that founders may delay an IPO as long as possible in order to better prepare for the intense demands of being a public company? What are the attributes of a firm that is IPO-ready? What attributes are important for readiness? What attributes are less important? What is the sequence in which successful entrepreneurs and top executives proceed to build IPO-ready firms? A better understanding of the pre-IPO process would be valuable. A second area for potential future research issue relates to a question that is raised by Chemmanur and Fulghieri (1999), viz., when is it optimal for a firm to go public rather than finance its projects through a private placement of equity? Chemmanur and Fulghieri (1999, p. 252) model that "... in equilibrium, firms go public only when a sufficient amount of information about them has accumulated in the public domain (so that the costs to outsiders of assessing true firm value become sufficiently small); (and) younger firms, which entail a greater information acquisition cost, choose the firm capitalist in equilibrium."

Finally, newly minted public firms take a U-turn and go private. From time to time in business history, "going private" waves have occurred – the most recent wave being in 2006-2007. Leveraged buyouts, management buyouts, and corporate restructurings form a separate stream of research dealing with relatively old firms and firms in special situations. Yet, there may be some parallels between "going public" and "going private" decisions that are worth exploring.

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Table I. Summary statistics and Correlations for key variables

Variables	Mean	Std. Dev.	1	2	3	4	5	6	7	8
1. TMT Average Age	43.25	4.41	1.00							
2. TMT Average Tenure	3.49	2.27	0.08	1.00						
3. TMT Size	6.54	2.34	-0.22**	-0.04	1.00					
4. TMT Age Heterogeneity	0.15	0.05	-0.07	0.05	-0.01	1.00				
5. TMT Tenure Heterogeneity	0.74	0.31	-0.12	-0.21**	0.25**	0.00	1.00			
6. TMT Functional Heterogeneity	0.69	0.14	-0.21**	-0.14	0.44**	0.02	0.32**	1.00		
7. Time-to-IPO	7.80	4.44	0.09	0.63**	0.18*	0.02	0.19*	0.09	1.00	
8. Firm Performance	24.62	27.87	-0.02	0.08	0.32**	-0.04	0.09	0.23**	0.18*	1.00

N = 156

** indicates significance at p<0.01 (two tailed)

* indicates significance at p<0.05 (two-tailed)

Table II. Models of relationships among TMT characteristics, Time-to-IPO and Performance at IPO

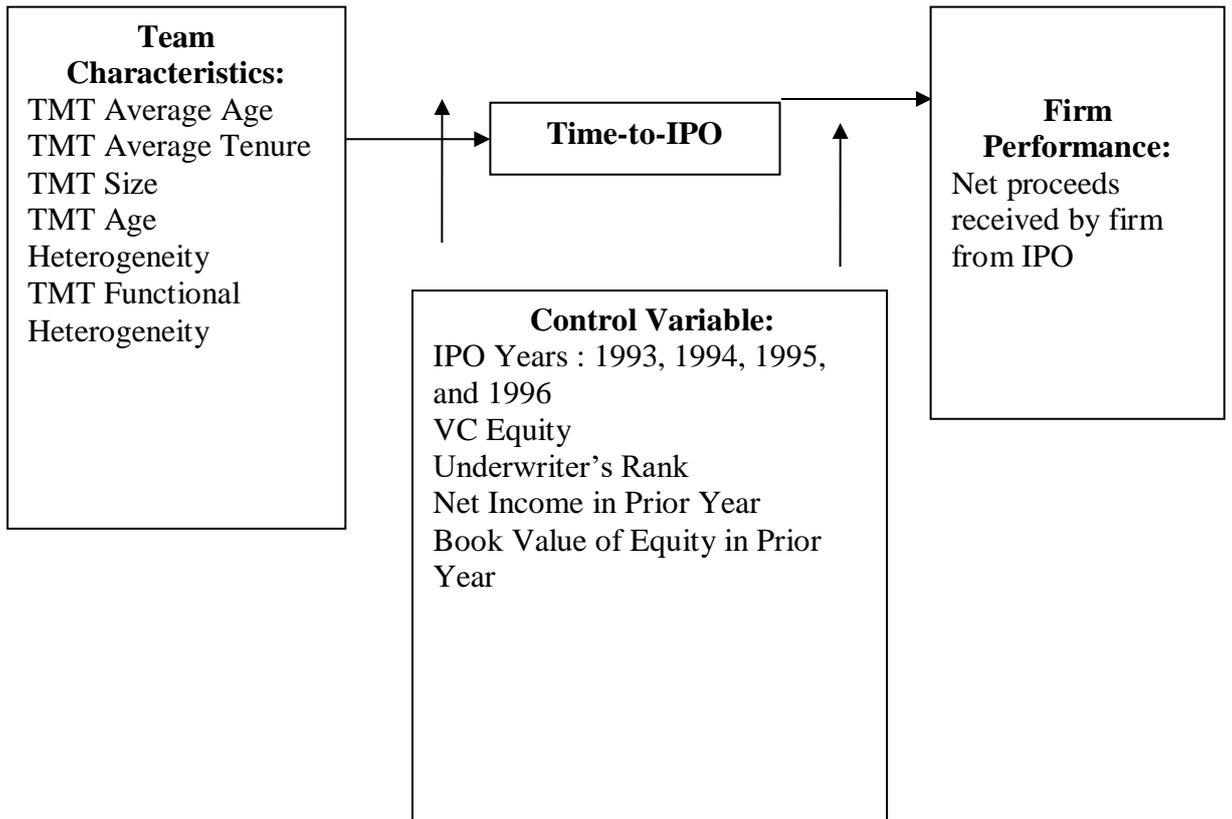
	Dependent: Time-to- IPO	Dependent: Firm Performance			
	2a	2b	2c	2d	2e
(Constant)					
IPO-year 1993	-0.11	-0.07	-0.07	-0.06	-0.07
IPO-year 1994	-0.06	0.02	0.03	0.04	0.03
IPO-year 1995	-0.18 [†]	0.13	0.13	0.15	0.16
IPO-year 1996	-0.04	0.18 [*]	0.19 [*]	0.19 [*]	0.18 [*]
VC Equity	0.02	-0.10	-0.10	-0.09	-0.09
Underwriter's Rank	-0.02	0.24 ^{**}	0.24 ^{**}	0.26 ^{**}	0.24 ^{**}
Net income prior year	0.10	0.40 ^{**}	0.39 ^{**}	0.38 ^{**}	0.36 ^{**}
Book value of equity prior year	0.02	0.01	0.01	0.02	0.03
TMT Average Age	0.12 [*]	0.07	0.06	0.06	0.03
TMT Average Tenure	0.68 ^{**}	0.09	0.07	-0.07	0.11
TMT Size	0.15 [*]	0.18 [*]	0.17 [*]	0.15 [†]	0.18 [*]
TMT Age Heterogeneity	0.00	-0.06	-0.06	-0.06	-0.07
TMT Tenure Heterogeneity	0.26 ^{**}	-0.01	-0.02	-0.04	-0.02
TMT Functional Heterogeneity	0.07	0.13 [†]	0.13	0.14 [†]	0.13 [†]
Time-to-IPO			0.02	0.08	-0.02
Time-to-IPO x TMT Average Tenure				0.18 [*]	
Time-to-IPO x TMT size					0.18 ^{**}
Adjusted R-squared	0.52	0.36	0.36	0.37	0.38
F	13.08 ^{**}	7.15 ^{**}	6.33 ^{**}	6.64 ^{**}	6.90 ^{**}
N	155	155	155	155	155

** indicates significance at p< 0.01

* indicates significance at p<0.05

† indicates significance at p<0.10

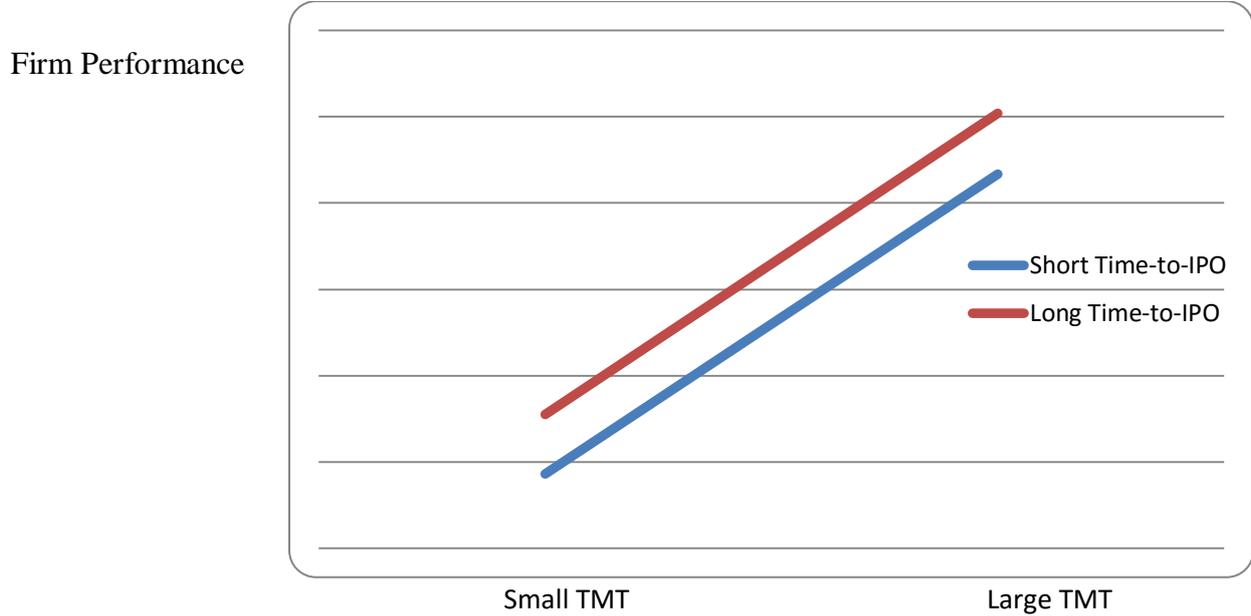
Figure 1. Relationships Between Team Characteristics, Time-to-IPO and Firm Performance



Figures 2a and 2b

Moderating effects of Time-to-IPO on the relationship between TMT characteristics and Firm Performance

2a. Time-to-IPO x TMT Size



2b. Time-to-IPO x TMT Average Tenure

