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Motivating innovation in newly public firms ☆

Nina Baranchuk [a], Robert Kieschnick [a,*], Rabih Moussawi [b]

[a] University of Texas at Dallas, USA
[b] University of Pennsylvania, USA

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ABSTRACT

Prior research suggests that executive option grants that do not quickly vest provide managers with better incentives to pursue long-term, instead of short-term, objectives. Previous research also suggests that the pursuit of long-term objectives could be undermined by the risk of early termination. We conjecture that these arguments jointly suggest that managers are better motivated to pursue innovation when they are given more incentive compensation with longer vesting periods for unexercised options and yet some protection from disruptive takeover threats. Our evidence for a sample of newly public firms is consistent with more innovative firms jointly choosing such a combination.

1. Introduction

How do shareholders motivate managers to pursue innovations that result in patents when substantial potential costs exist to managers who do so? This question has taken on special importance as promoting these kinds of innovations has become a critical element of not only the competition between companies, but also the competition between nations. We address this question by providing empirical tests of predictions arising from recent theoretical studies of this issue.

A number of theoretical models suggest that long term incentive compensation plans, such as option grants with long vesting periods, can be used to motivate managers to pursue long term objectives, such as innovation (e.g., Skeie, 2004; Manso, 2011; Bebchuk and Fried, 2010; Laux, 2012). Importantly, both Manso (2011) and Laux (2012) note that a focus on long-term objectives sometimes implies poor short-term performance. Based on this concern, Manso (2011) concludes that this could require a tolerance for failure in order to give managers an incentive to pursue innovation. Such a tolerance may mean a positive reward for poor short-term performance or Chief Executive Officer (CEO) entrenchment [using, for example, antitakeover provisions (ATPs), which make firing a CEO more difficult]. Similarly, Skeie (2004) argues that providing entrepreneurs with more control rights (i.e., entrenchment) and using longer vesting periods is especially important when actions and outcomes are not contractible or verifiable, which seems especially true for innovative firms.

Laux (2012), however, shows that in the presence of an active market for CEOs, the commitment to retain a poor

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* Correspondence address: Naveen Jindal School of Management, University of Texas at Dallas, 800 W. Campbell Rd, SM31, Richardson, TX 75080.

E-mail address: rkiesch@utdallas.edu.(R. Kieschnick)

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performing CEO in the short term could be too costly. In this case, Laux (2012) suggests that, instead of entrenching their CEOs, firms compensate them with options that vest quickly but cannot be exercised for a long time. A CEO who owns such options would be less concerned with being fired (and, thus, less concerned about short term performance) because all vested options are retained upon firing, but he would still be concerned with long-term performance because the value of these options would depend on the long term value of the firm.

We test these ideas by examining what combination of deferred compensation, vesting periods, and takeover restrictions that innovative firms use in a sample of newly public US firms from 2001 through 2004. We focus on newly public firms for three important and related reasons. First, we do not observe CEO compensation in private firms. Second, many newly public firms are focused on innovative activities. Thus, with initial public offerings (IPOs), we a priori expect that the link between intensity of innovative effort and firm governance to be statistically and economically stronger than that for the average seasoned firm. Third, the design features that figure prominently in theoretical studies, such as the structure of the CEO's compensation and degree of entrenchment, are likely to be reviewed and selected at the IPO stage, reducing concerns about path dependence. A seasoned firm with little current interest in innovation could have strong antitakeover provisions in place because these provisions had been adopted in the past to encourage past innovations, but they were difficult to remove once being innovative became less important.

Examining hand-collected detailed data on a sample of US IPOs from 2001 to 2004, we test whether the combination of tolerance for failure and rewards for long-term success induces the CEO to adopt more innovative paths for the firm. We collect governance and compensation data for all 360 IPO companies during the sample period. We match this sample of IPO firms to their patent application and approval data to create novel patent-based measures that better capture the outcome of firm innovation activities. We find evidence that largely supports the hypothesis that firms combine deferred compensation with longer vesting periods and with short-term protection to encourage innovation. First, we find that the length of the vesting period of a CEO's unexercised and unexercisable options, the proportion of the CEO's compensation in deferred compensation, and the firm's use of stringent antitakeover defenses are positively and significantly correlated with their pursuing an innovative strategy. Second, complementing the first result, we find that these same features are negatively and significantly correlated with the pursuit of noninnovative strategies. Third, we find evidence that the level of incentive compensation is positively correlated with both the degree of takeover protection and the length of the vesting period in firms that subsequently produce patents. Fourth, we find the anticipated innovative activities of these firms are a significant determinant of their valuation when going public. Fifth, we find evidence that the level of the firm's observed innovative activity after going public is positively correlated with its CEO incentive compensation, the maximum vesting period of his unexercised options, and the use of stringent governance restrictions. Further, we find these relations hold for the subsample of IPOs in industries that actively pursue patentable innovation, after excluding industries that have little patent activity. Thus, our evidence is consistent with the argument that firms wishing to pursue innovation that results in patents would provide their CEOs with more incentive compensation, with longer vesting periods, and with more protection from early termination.

Our evidence is also consistent with different pieces of evidence in related research. Consistent with the role of a CEO's incentive compensation, Bereskin and Hsu (2011) examine the effect of CEO characteristics and compensation after a CEO turnover on the firm's innovative activity. They find that overconfident internal replacements compensated with more incentive pay produce more and better cited patents, which are their measures of the quantity and quality of the firm's innovative activity. Francis, Hasan, and Sharma (2010) also find that different measures of firm innovative activity [research and development (R&D) spending, patents granted, etc.] are positively correlated with CEO incentive compensation for a sample of ExecuComp firms between 1992 and 2002. Consistent with the role of the vesting period, Gopalan, Milbourn, Song, and Thakor (2012) find evidence that longer vesting periods are positively correlated with a firm's innovative activity (e.g., R&D, growth prospects). And, finally, O'Connor and Rafferty (2012) and Chemmanur and Tian (2012) report evidence that a firm's use of stringent antitakeover provisions is significantly correlated with its innovative activities. The notion that a "tolerance for failure" is conducive to innovative activities is also supported by the evidence in Tian and Wang (forthcoming) and Azoulay, Graff Zivin, and Manso (2011).[1] Missing from this empirical research, however, is any consideration that these features may play complementary roles in motivating CEOs to pursue innovative strategies. Complementarity is crucial for some of the theories discussed earlier, and is the focus of this paper which proceeds by first describing our data before presenting our analyses and checks on the robustness of our evidence.

2. Sample and sample data

We use Thomson's *New Issues* database to identify all US IPOs during the four year period from January 1, 2001 through December 31, 2004. We chose this time period for four important reasons. First, the reporting of executive compensation in IPO prospectuses is more detailed than in the prospectuses available to prior IPO studies (e.g., Field and Karpoff, 2002). Second, this period is subsequent to the Internet IPO bubble and, therefore, is less likely to be driven by the possible uniqueness of this period. Third, this period is prior to the financial crisis and the collapse of the IPO market. Fourth, sufficient time has passed for us to observe these firms' subsequent innovative activities.

[1] Acharya and Subramanian (2009) and Acharya, Baghai-Wadji, and Subramanian (2012) provide evidence consistent with another aspect of Manso's model as it pertains to bankruptcy laws.