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# Premiums, announcement returns and desperation in high tech mergers: A growth options analysis

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## ABSTRACT

We examine the announcements of high tech mergers using a relatively new proxy for growth options we call “growth to book.” We find this adds significantly to help explain the premiums paid and announcement period abnormal returns when acquiring tech targets. Higher synergies are expected by managers and investors when targets have low growth options and acquirers have high growth options, resulting in higher premiums paid and either less negative or more positive abnormal returns. However, we find significant variation in the results by the relative size of the target and when low growth to book (*GTB*) firms acquire. While high *GTB* acquirers tend to pay more in premiums, low *GTB* acquirers can pay higher premiums and receive some of the most negative returns at announcement. We find evidence some acquisitions are motivated by desperation as these acquirers have the lowest *GTB* and do a disproportionate number of the relatively largest deals, receiving the worst abnormal returns at announcement.

## 1. Introduction

Corporations commonly acquire publicly traded tech companies and normally must offer a premium above the prevailing market price of that target to obtain control. The premium is relevant because it determines the payoff to target shareholders who relinquish control. It also determines the cost incurred by the acquirer to obtain control, and can influence the opinions and ultimate assessment of whether the acquisition was worthwhile. Further, the market's response to the announcement signals investor sentiment, measured in positive or negative abnormal returns to the acquirer. These abnormal returns can relate to firm and deal characteristics, and what increases the premiums paid may have the opposite effect on abnormal returns. We focus on high tech acquisitions because high tech now dominates non-regulated mergers and acquisitions activity. After removing financial and utilities firms, over 60% of public companies being acquired are high tech firms.

The decision to acquire is often motivated by a variety of factors such as expected synergies or mispricing. Other factors include Jensen's (1986) agency theory or Roll's (1986) hubris. Gorton, Kahl, and Rosen (2009) suggested acquisitions could be defensive or “positioning” related, with the latter being firms making themselves more likely targets. Kim, Haleblan, and Finkelstein (2011) found evidence of desperation in some mergers. More specific to an analysis of high tech firms, Higgins and Rodriguez (2006) found that declining R & D productivity motivated pharmaceutical firms to acquire. We examine mergers in a growth options construct to not only determine what affects premiums and abnormal returns, but growth options may help explain some of the motivations that lead tech firms into the market for corporate control. Our analysis of high tech mergers extends the work of Davis and Madura (2015) who developed a growth options proxy for managerial effectiveness called Gamma ( $\Gamma$ ) which we call “growth to book.” They found that

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growth options significantly affect the likelihood that firms are acquired or will acquire others, and we investigate how target and acquirer growth options may affect the premiums paid and abnormal returns when mergers are announced.

Asquith (1983), Flanagan and O'Shaughnessy (2003), Madura and Ngo (2008), and Alexandridis, Fuller, Terhaar, and Travlos (2013) and others have assessed why merger premiums varied. In general, they found that merger premiums are more pronounced for relatively small targets, and when there are multiple bidders. Other results tend to vary among studies, which indicates that the key characteristics may vary with the sample assessed. The results for abnormal announcement returns (ARs) are varied in the literature and depend on the sample examined. The acquisition of public targets tends to produce negative returns at announcement, while private target acquisitions are viewed more positively by investors. Moeller, Schlingemann, and Stulz (2004) found that ARs varied by size, and Alexandridis et al. (2013) found that the acquisition of larger targets produced significantly more negative ARs. Lang, Stulz, and Walkling (1989) and Servaes (1991) find that takeovers are more successful when the bidder is performing well and the target is performing poorly going into the merger. This last point suggests synergies motivate many acquisitions and is consistent with Palepu (1986) who proposed a growth-resource mismatch hypothesis for mergers.

We focus our analysis on high tech firms not only because they represent such a large share of deals, but because their embedded growth options may alter the potential synergies from mergers in unique ways. This may provide valuable insights into the premiums paid to achieve a change in control, and how investors may respond to these announcements. One could argue that at a given point in time, publicly traded tech firms should be properly valued by the market, so that the premium they could command if approached by a buyer would be similar. Past studies have attempted to identify firm-specific characteristics that can influence the premium paid for a target. However, most of these studies have focused on mergers in general, without an explanation for the wide variation among premiums in the technology sector. Tech firms are unique because they offer much potential for growth and invest heavily in *R & D*. Because of their higher growth expectations and risk, generalizing about tech firms versus non-tech firms may lead to incomplete explanations about what motivates and produces synergies in high tech acquisitions. Our objectives are to offer more complete explanations for what motivates some tech mergers and the variation in premiums paid and abnormal returns when tech firms are acquired.

## 2. Review of the literature

We rely on academic literature on the premiums paid in a merger, on abnormal returns to an acquirer at the deal's announcement, and on growth options. We view the terms growth options and real options as synonymous, but we use the term "growth options" since it is more commonly used in empirical studies.

Asquith (1983) and Madura and Ngo (2008) suggest that the premium paid in a merger is influenced by the expected value of the synergies realized from the merger. If an acquiring firm attempted to buy a firm below its synergistic value, an efficient and competitive market should intervene. The synergies hypothesis is supported by Flanagan and O'Shaughnessy (2003) who found that higher premiums were paid when the acquirer and target were in related industries. However, Madura and Ngo (2008) found that the premiums paid were inversely related to the market's response to merger announcements. Mergers can be motivated by a variety of factors including expected synergies, mispricing, Jensen's (1986) agency, Roll's (1986) hubris, or even desperation as found by Kim et al. (2011). Gorton et al. (2009) suggested acquisitions could be defensive or "positioning" related. They suggested that defensive mergers were a race to becoming larger to "eat or be eaten." Positioning acquisitions were in industries with dominant players, and becoming larger made a firm a more attractive target. More specific to an analysis of high tech firms, Higgins and Rodriguez (2006) found that declining *R & D* productivity motivated pharmaceutical firms to acquire.

Firm level and deal characteristics have also been found to affect both the premiums paid and the abnormal announcement period returns, and they may do so in asynchronous ways. Moeller et al. (2004) found that large firms experienced significant abnormal announcement period returns, but the acquisition of relatively smaller targets had a positive impact on ARs. Alexandridis et al. (2013) found that the acquisition of larger targets produces significantly more negative ARs, and they suggest an inherent complexity in the acquisition of larger firms. Lang et al. (1989) and Servaes (1991) find that takeovers are more successful when the bidder is performing well and the target is performing poorly going into the merger, yet Baker, Dutta, Saadi and Zhu (2012) found that prior operating performance of the acquirer may have a negative impact on ARs. Gondhalekar, Sant, and Ferris (2004) found that a firm's opportunities for internal investment and free cash flow jointly affect the premiums paid. They observed that the growth level of a firm may interact with financial resources to produce a discontinuous effect on premiums.

Davis and Madura (2015) found that growth options significantly affect the likelihood that firms are acquired or will acquire others. We apply their proxy for growth options efficiency to an analysis of premiums and announcement returns for tech acquisitions to address some of the varied results in prior studies. We suggest that typical mergers seek expected synergies, but they may be motivated by other suboptimal factors such as hubris or desperation. While many studies have explored growth options of tech firms, they have not closely investigated whether and how growth options influence the premiums paid nor announcement period returns to acquirers in high tech acquisition. Our contribution to the existing literature is to directly address whether and how growth option characteristics influence premiums and ARs, while addressing some of the firm and deal characteristics that interact to create variations in results mentioned above.

## 3. Hypothesis development

The hypotheses examined in this essay are derived from variables which fall into two groups: 1) growth options, valuation and size, and 2) firm and deal characteristics, and economic factors. The former is the primary focus of our inquiry, and the latter will be

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