



Stocking up: Executive optimism, option exercise, and share retention[☆]



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ABSTRACT

We show that an executive is optimistic about her company's prospects if and only if she retains some of the shares received whenever she exercises company stock options. Empirically, an indicator of optimism based on this idea matches the expected relations between optimism and corporate decision-making better than commonly used indicators based on the timing of option exercise. This makes sense, as our model of an executive's optimal option exercise and portfolio choice demonstrates that the timing of option exercise depends just as much on stock and other executive characteristics as it does on optimism.

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1. Introduction

Optimism shows up as a pervasive and powerful psychological bias in experimental and business settings, and it has been shown to influence key corporate policies, such as financing, investment, and acquisition decisions.¹ As evidence suggests that executives make private and professional decisions similarly (Cronqvist, Makhija, and Yonker, 2012), measures derived from an executive's personal security holdings have been used to analyze the

¹ Ben-David, Graham, and Harvey (2013), Larwood and Whittaker (1977), March and Shapira (1987), Scheier, Carver, and Bridges (1994), Svenson (1981), and Weinstein (1980) explore the psychological foundations of optimism. Ben-David, Graham, and Harvey (2013), Graham, Harvey, and Puri (2013), Hirshleifer, Low, and Teoh (2012), Kolasinski and Li (2013), Malmendier and Tate (2005a,b, 2008), and Malmendier, Tate, and Yan (2011), among others, show that optimism affects corporate policies.

effect of optimism on corporate outcomes. While the important corporate policy implications of executive optimism have received a great deal of theoretical attention, how an executive's optimism affects her management of her personal portfolio of company stock and options has not.² Yet, a theoretical foundation that explicitly incorporates optimism is needed to help researchers assess the quality of existing optimism measures and for the development of robust new measures.

We model an optimistic executive's option exercise and portfolio choice problem under a general concave utility function. Given an initial endowment of outside wealth and a non-transferable call option on company stock, the risk-averse executive in our model maximizes her expected utility from terminal wealth. She chooses when to exercise the option and is allowed to take unrestricted long positions in company stock, but is not permitted to short it. We model optimism as a subjective personal belief that the company stock will have positive abnormal returns, even though the true stock-return process has a zero abnormal return.³

In our model, executives exercise options for two distinct reasons: to rebalance their portfolios and to capture dividends. When rebalancing to optimize risk and return, optimistic executives tend to exercise their options in a way that limits the time value lost on early exercise, resulting in exercises closer to expiration and at higher underlying stock prices than exercises by their less optimistic peers. This portfolio-rebalancing exercise motive exists for options on both dividend-paying and non-dividend-paying stocks. Moreover, the model demonstrates that the dividend-capture motivation is universal, affecting even the most optimistic executives. In standard option pricing theory, the ability to dynamically replicate an option's payoff makes an agent's outlook on a stock irrelevant; an agent who is allowed to short stock will hedge the option in the market and may exercise before expiration to capture dividends. We show that an optimistic executive who is unable to hedge an option should nonetheless exercise it whenever an unconstrained agent would. An executive will not delay option exercise beyond a reasonable price boundary because she can always buy shares in the open market to satisfy her desire for equity exposure to the firm.

A significant value of our model is the theoretical sandbox it provides for analyzing option exercise policy and evaluating indicators of executive optimism. The

model demonstrates an interplay among optimism, option exercise policy, observable stock parameters, like dividend yield, volatility, and beta, and unobservable characteristics of the executive, such as outside wealth and risk aversion. It therefore provides a deeper understanding of how optimism will affect exercise decisions for executives. For example, an option on a high beta stock should be exercised at higher prices and closer to expiration than an option on a stock with a low beta and equivalent total volatility. It may also be optimal for an optimistic executive to exercise options well before expiration or at seemingly low stock prices if the executive has low outside wealth or is very risk averse. A key prediction of the model is that the retention of shares received from option exercise is positively related to the option's intrinsic value and negatively related to its remaining time until expiration. We confirm these predictions empirically.

Our theoretical analysis shows that an executive will retain shares received from exercising company stock options if and only if she is optimistic. Whereas a characterization of the timing of option exercise as a function of optimism is complicated by the intricate way stock and executive characteristics determine the exercise policy, share retention has a simple interpretation. Whether rebalancing to achieve a more optimal risk-return balance or to capture dividends, non-optimistic executives sell all shares realized from option exercise, while optimistic executives retain a fraction of the shares.

We turn this theoretical result into a novel empirical technique to determine if an executive is, in fact, optimistic. Influential papers by Malmendier and Tate build off the behavioral consistency of executives to infer professional managerial biases from personal investment portfolio decisions. Similarly, our indicator of optimism, *Share retainer*, is based on observing an executive's stock transactions that coincide with option exercise. We show that executives who hold shares after exercising behave in ways that optimistic executives would be expected to behave in terms of leverage, financing, and acquisitions.⁴

In fact, *Share retainer* establishes support for key predictions of the theoretical behavioral corporate finance literature for a wider cross-section of firms and a more recent sample period than analyzed in previous studies. Option-portfolio-based indicators of optimism commonly used in the literature have been tested on a sample of large firms, frequently covering the period from 1980 through 1994. We find that these indicators do not provide statistically significant results for our sample of firms, which covers a greater variety of firm sizes from fiscal years 1993 through 2011. *Share retainer*, on the other hand, is strongly related to leverage, financing, and acquisitions for this sample.

It is straightforward to compute *Share retainer*. Regardless of her risk aversion, wealth, or the company's stock characteristics, one need only examine whether an

² Theoretical models examining the role of optimism on corporate financial policies include Bergman and Jenter (2007), Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011), Goel and Thakor (2008), Hackbarth (2009), Heaton (2002), and Malmendier and Tate (2005a).

³ Like Baker, Ruback, and Wurgler (2007), Baker and Wurgler (2013), and Ben-David, Graham, and Harvey (2013), we use the term "optimism" specifically to mean that the executive has higher return expectations for her company's stock than those held by the market. Optimism in this paper is a belief. It is not necessarily a personality trait, an overestimation of ability, or a general market outlook. By contrast, Malmendier and Tate (2005a,b, 2008) consider an overconfident executive to be one who overestimates her skill, believing her firm will outperform market expectations. Such overconfident executives are a subset of our optimistic ones, which, for example, also includes executives who overestimate returns but accurately evaluate their own skill.

⁴ The tendency of an executive to purchase shares for her personal portfolio could also indicate optimism (Billett and Qian, 2008; Malmendier and Tate, 2005a). However, as discussed later, *Share retainer* has several desirable empirical qualities that would not be present in an optimism indicator based on share purchases.

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