Stock option contract adjustments: The case of special dividends ☆

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Abstract

The terms of stock option contracts are adjusted in the event of unexpected corporate actions, and the nature of the adjustments may result in windfall gains or losses to open option positions. This paper evaluates the fairness of the two different procedures used for special cash dividends. We show that, while neither procedure is technically correct, the absolute adjustment used in the U.S. and Canada minimizes the windfall change in option value when the dividend is announced. In addition, the proportional adjustment used in Australia and Europe depends on stock price and is therefore vulnerable to temporary aberrations in the stock market.
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0. Introduction

Stock option contracts are unusual to the extent that their terms must be adjusted to reflect unexpected corporate actions. Spinoffs, cash or stock takeovers, rights issues and special dividends are among the events that may trigger changes to the exercise price and expiration date of outstanding option positions. The fairness of the adjustment procedures

is critical to market integrity. Neither the option buyer nor the option seller should suffer as a result of the action. Clearing authorities guard the integrity of outstanding contracts, and the fairness of contract adjustments for corporate actions is chief among their concerns. The stock option clearing authority in the U.S., the Options Clearing Corporation (OCC) in its bylaws states:

> … all adjustments to the terms of outstanding cleared contracts shall be made by the Securities Committee, which shall determine whether to make adjustments to reflect particular events in respect of an underlying interest, and the nature and extent of any adjustment, based on its judgment as to what is appropriate for the protection of investors and the public interest, taking into account such factors as fairness to holder and writers (or purchasers and sellers) of affected contracts,…[1]

The purpose of this paper is to analyze the fairness of contract adjustment procedures used for one particular corporate event—a special cash dividend. As it turns out, different clearing authorities use different contract adjustment procedures. In the U.S. and Canada, the exercise price of the option is reduced by the amount of the dividend on the ex-dividend day. In Europe and Australia, on the other hand, the exercise price is reduced and the number of deliverable shares is increased proportionally by the ratio of the dividend relative to the cum-dividend stock price.

The fact that the second adjustment procedure depends on share price makes it susceptible also to temporary aberrations in the stock market. This was made abundantly clear recently when Altana AG, a specialty chemical company in Germany, paid a special dividend of €33 on shares trading at about €50. Published reports suggest that the last cum-dividend stock price was traded to an artificially low level, thereby affecting contract adjustment. When the stock price quickly returned to equilibrium levels, windfall gains (losses) were earned (incurred) by call option buyers (sellers). Market-making firms, which tend to be short options, bore the losses. One market-making firm reported a loss of $37 million as a result of the increased cost of covering its short position in Altana call options.[2]

The outline of the rest of the paper is as follows. In the first section, we describe in detail the absolute and proportional contract adjustments and show that, if the underlying stock's volatility rate does not change as a result of the special dividend, the proportional contract adjustment produces no change in option value. The assumption that volatility does not change is implausible, however, since the disbursement of cash must cause firm's stock return volatility to rise. In the second section, we examine the characteristics of firms about to pay special dividends. We find that firms generally have large known cash balances and few investment opportunities. In the third section, we explain why standard option valuation models fail to account for the effects of dividend payments correctly and show how to model the effect of the cash disbursement on the stock's volatility rate using a displaced diffusion process. In the fourth section, we use the displaced diffusion option valuation model to determine the preferred adjustment procedure. The absolute adjustment is shown to be fairest to both long and short option holders. In section five, we examine the sensitivity of the proportional contract adjustment to stock price using

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[1]The Options Clearing Corporation By-Laws, Adjustment Panel Policies and Procedures, Section 11 of Article VI.

[2]See Forbes.com, "Interactive Brokers Cries Foul," July 6, 2007, and IBG Inc. Annual Report, 2007.