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Price adjustment method and ex-dividend day returns in a different institutional setting☆

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ABSTRACT

This study investigates the determinants of the ex-dividend day price behavior in the Athens Stock Exchange (ASE), a unique institutional setting, and examines how a major regulatory change in the price adjustment method affects the extent of the ex-day stock price drop. We find that allowing the market to freely adjust prices, after 2001, the ex-dividend day price improves the pricing efficiency of the market in the sense that the raw price ratio tends to one and abnormal returns tend to zero. We also find that in the absence of taxes on dividends and capital gains and certain microstructure impediments discussed in the literature – i.e., bid-ask spread, market makers, price discreteness, tick size and limit order adjustment mechanism – stock illiquidity is the best candidate for explaining the magnitude of the ex-dividend day price adjustment.

1. Introduction

According to standard financial theory, the share price on the ex-dividend day should fall by an amount exactly equivalent to the dividend paid on each share. However, empirical results show that, on average, stock prices drop by less than the dividend amount distributed. Studies have proposed several explanations for the unequal price drop. These include the existence of tax-induced clienteles (when the tax rate applicable to income from capital gains is lower than that from dividends).[1] Other studies challenge the tax effect and propose the short-term trading hypothesis according to which transaction costs and risk affect ex-day prices and volume behavior.[2] Additionally, other researchers have proposed market microstructure explanations, arguing that the ex-dividend day price drop is strongly affected by the bid-ask spread (nuisance of handling dividends), price discreteness of stock prices due to minimum tick sizes, absence of electronic settlement systems, and other behavioral biases.[3]

One way to further clarify our understanding is to study the ex-dividend day price behavior in an environment where the above factors are either absent or limited. Such are the markets of Hong Kong, and Oman, where both dividends and capital gains are not taxed, thus offering the opportunity to study the ex-dividend day returns in the absence of confounding tax effects present in other markets. The Hong Kong stock exchange (HKSE) provides such an institutional setting. Frank and Jagannathan (1998) examine the period 1980–1993 and find that the average price drop on the ex-day is only 43% of the dividend, leading to an ex-day return of 1.33%, their main explanation refers to market microstructure and bid-ask bounce; Kadapakkam (2000) also examines the HKSE for the period 1990–1995, following the launch of an electronic settlement system, and finds that the ex-dividend day returns declined to an insignificant 17% and concludes that "overall, the evidence supports the argument that regulatory or institutional features that inhibit short-term trading will adversely affect pricing efficiency of financial markets". Al-Yahyaee, Pham, and Walter (2008) investigate

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[1] See Elton and Gruber (1970), Michaely and Murgia (1995), Green and Rydqvist (1999), Bell and Jenkinson (2002), Milonas, Travlos, Xiao, and Tan (2006), Graham, Michaely and Roberts (2003), Elton, Gruber, and Blake (2005) and Dhaliwal and Li (2006).

[2] See Kalay (1982), Lakonishok and Vermaelen (1986), Heath and Jarrow (1988), Karpoff & Walkling (1988, 1990), Grammatikos (1989), Boyd and Jagannathan (1994) and Michaely and Vila (1995, 1996).

[3] See Shefrin and Statman (1984), Dubofsky (1992), Frank and Jagannathan (1998), Bali and Hite (1998), Kadapakkam (2000), Jakob and Ma (2004), Al-Yahyaee et al. (2008).

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the Oman Stock Exchange, where taxes are also absent for the period 1997–2005. Results show that ex-day stock prices fall by significantly less than the dividend amount with the price drop ranging between 65% and 69%. Their main market microstructure explanation refers to the bid-ask spread, which is consistent with Frank and Jagannathan (1998).

The Athens Stock Exchange (ASE) offers an even more unique institutional setting to study ex-dividend day stock price behavior. Besides dividends and capital gains being tax free, dividends are annual, mandatory and the transaction costs are low.[4] Also, significant market microstructure impediments observed in other developed stock markets (i.e., bid-ask spread, market makers, price discreteness, tick size and limit order adjustment mechanism) are not present in the ASE. Specific institutional characteristics of the ASE, analyzed in the following section, allow us to exclude the respective explanations presented for the ex-dividend day stock price anomaly, that is, the bid-ask spread and market maker hypothesis (Frank and Jagannathan (1998)), the price discreteness and tick size hypothesis (Bali and Hite (1998)) and the limit order adjustment mechanism hypothesis (Dubofsky (1992)).

Milonas and Travlos (2001) examine stock price behavior on the ex-dividend day in the ASE for the period 1994–1999. Their findings show that on the ex-dividend day, stock prices fall less than the dividend paid (43%). They argue that their results cannot be attributed to tax effects and that the particular microstructure effects identified by prior studies are not the determining factors. Dasilas (2009) examines the ex-dividend price and trading volume behavior in ASE during the period 2000–2004 and finds that stock prices drop less than the dividend and the mean raw price ratio (87%). The main explanation he proposes is short-term trading (short-term traders contribute to the efficiency of financial markets by constantly searching the markets for arbitrage opportunities).

Thus, although the price drop is well established as an empirical regularity, for US and non-US stock markets, the explanations offered for the observed anomalous ex-day price behavior reveal that there is a lack of unanimity in the conclusions and that it is still very much an unresolved issue making further research potentially useful.

The aims of this study are: (a) To examine how the introduction of a new regulation may affect the ex-dividend day stock price behavior in a market with a unique institutional setting (no dividend and capital gain taxes) and to test the hypothesis that market pricing improves after the introduction of the new ex-dividend day price adjustment method (this is the first study to consider the effect of the adjustment method on the ex-day returns, comparing returns for the period "before" and "after" the change of the institutional setting); (b) to identify possible determinant factors explaining the ex-dividend day stock price drop; and (c) to re-examine the ex-dividend day behavior in the ASE using an extended sample period (1996–2005), updating earlier research.

Until the first quarter of 2001 the opening stock price on the ex-dividend day (P_0) was calculated automatically by the ASE before the opening of the market as the difference between the share price on the last cum-dividend day (P_{-1}) (closing price on the day prior to the ex-dividend day) minus the dividend per share paid (D), ($P_0 = P_{-1} - D$).[5] However, starting April 2, 2001, the board of directors of the ASE approved to end the automatic adjustment of the opening stock price on the ex-dividend day (Law published in the Gov. Gaz. 355B/30-3-2001). Now the opening share price on the ex-dividend day (P_0) is set equal to the share's price on the last cum-dividend day (P_{-1}), i.e., $P_0 = P_{-1}$ and trading orders given by investors determine the degree of the price adjustment and naturally the closing price on the ex-day. The new mechanism transfers the adjustment of the ex-day price to knowledgeable professionals and investors. Thus, we may expect the raw price ratio to increase compared to the previous period ("before"), which may be considered an indication of improvement in market pricing efficiency.

We find that the introduction of the new institutional feature – the change of the ex-day price adjustment method – increased the raw price ratio on the ex-dividend day from 37% to 62% and the abnormal returns decreased from 2.26% to 1.18%, all statistically significant. Also, abnormal volume remains similarly significant in both periods ("before" and "after"); however, volume is slightly smaller with the new adjustment method. The cross sectional regression analysis of abnormal returns to several variables reveals no significant effect. In addition, evidence of a clientele preference of capital gains over dividends is not observed (there is no significant clear pattern between the relative price drop and dividend yields). Thus, it is not possible to infer the marginal investor's income tax rate, which is a central part of the tax clientele hypothesis. Also, we find that illiquidity is the strongest candidate in explaining the magnitude of the ex-dividend day price adjustment (in the low illiquidity quartile (high liquidity) the price drop equals the dividend amount and the abnormal returns are close to zero).

This study contributes to the international literature on ex-dividend day behavior in a tax-free environment in three ways. First, it offers evidence that allowing the free function of the market, by relaxing institutional intervention levels-out pricing inefficiencies. Second, it identifies share illiquidity (a proxy for the bid-ask spread) as the strongest impediment and proposes an explanation for the ex-dividend day price behavior in the ASE. Finally, it provides a better understanding of market pricing for academics as well as professionals interested in forming investment strategies in markets with similar and other institutional settings.

The remainder of the paper is organized as follows. Section 2 provides information concerning the institutional setting and market microstructure impediments of the ASE. Section 3 describes the data and the sample. Section 4 presents the tests, and interprets the results. Section 5 summarizes the paper.

2. Institutional setting and market microstructure impediments

As previously noted, research covering other markets suggests that microstructure impediments (market features) may prevent the ex-dividend day stock price from dropping by an amount equal to the dividend paid, resulting in positive ex-day returns. However, in the ASE certain impediments are not present due to the different institutional setting (rules and procedures) that was in effect during the period investigated. In this section we present the market characteristics described in the literature as impediments for the ex-day price adjustment, which are not present in the Greek capital market, i.e., bid-ask spread, market makers, price discreteness, tick size, and limit order adjustment mechanism.

2.1. Bid-ask spread and market makers

Frank and Jagannathan (1998) argue that, despite the absence of taxation in the Hong Kong stock exchange, stock prices drop on the ex-dividend day by half the amount of the dividend paid and has been attributed to the effect of the bid-asked spread. They suggest that for the average investor it is a burden to receive and reinvest dividends so they choose not to receive them, but this is not true for market makers. Thus, large traders/market-makers have a comparative cost advantage

[4] During the period studied, according to corporate Law 2190/1920, profitable firms are required to distribute a minimum dividend equal to either 6% of their outstanding share capital or 35% of net profits after tax, whichever of the two amounts is larger. Shareholders are not subject to any taxes on dividends received or capital gains realized. This makes investors indifferent to the source of their returns. (Today firms are obligated to distribute as dividends only at least 35% of their profits after tax. Also, see Castillo and Jakob (2006) for mandatory dividend distributions in Chile).
Commission costs in the ASE were deregulated in 1996; since then, brokerage fees are set freely, but not above a maximum percentage of 1% set by the Association of Securities Firms. The suggested fee structure is scaled down to a maximum fee of 0.50% for transactions larger than €8,800. However, large transactions by institutional investors are subject to even smaller fees of around 0.10% to 0.20%. Also, after March 1998, a 0.30% flat sales tax was imposed on the proceeds from stock sales. In late 1999 it increased to 0.60% and in 2001 it fell again to 0.30%.

[5] Even shares with no trading activity on the ex-dividend day are adjusted downward for the distributed dividend.