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Can splits create market liquidity? Theory and evidence☆

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Abstract

We present a market microstructure model of stock splits in the presence of minimum tick size rules. The key feature of the model is that discretionary trading is endogenously determined. There exists a tradeoff between adverse selection costs on the one hand and discreteness related costs and opportunity costs of monitoring the market on the other hand. Under certain parameter values, there exists an optimal price. We document an inverse relation between the coefficient of variation of intraday trading volume and the stock price level. This empirical evidence and other existing evidence are consistent with the model. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

U.S. firms split their stocks quite frequently. In spite of inflation, positive real interest rates, and significant risk premiums, the average nominal stock price in the U.S. during the past 50 years has been almost constant. Why would firms keep on splitting their stocks to maintain low prices? This behavior is puzzling since, by doing so, firms actively increase their effective tick size (i.e., tick size/price), potentially exposing their stockholders to larger transaction costs.

This paper presents a value maximizing market microstructure model of stock splits. Our model joins practitioners in predicting that firms split their stocks to move the stock price into an optimal trading range in order to improve liquidity.[1,2] The driving force of the model stems from the fact that prices on U.S. exchanges are restricted to multiples of 1/8th of a dollar.[3] This restriction on prices creates a wedge between the "true" equilibrium price and the observed price.[4] Thus a portion of the transaction costs incurred by traders is purely an artifact of discreteness.

Anshuman and Kalay (1998) show that discreteness related commissions depend on the location of the "true" equilibrium price on the real line. In other words, whether the discrete pricing restriction is binding or not depends on the location of the "true" equilibrium price relative to a legitimate price (tick) in a discrete price economy. It may so happen that the "true" equilibrium price (plus any transaction cost) is close to a tick. Discreteness related commissions would be low in such a period. As information arrives in the market, the location of the "true" equilibrium price changes, and discreteness related commissions would, therefore, vary over time. They could be as low as 0 or as high as the tick size.

Interestingly, liquidity traders can take advantage of the variation in discreteness related commissions by timing their trades. Of course, such

[1] Academicians have mostly relied on signaling models to explain stock splits (Grinblatt et al., 1984). More recently, Muscarella and Vetsuypens (1996) provide evidence consistent with the liquidity motive of stock splits. Practitioners, however, have all along held the belief that stock splits help restore an optimal trading range that maximizes the liquidity of the stock (see Baker and Powell, 1992; Bacon and Shin, 1993).

[2] Independent of our work, Angel (1997) has also presented a model of optimal price level that explains stock splits. In his model, the optimal price provides a tradeoff between firm visibility and transaction costs. In contrast, our model examines the behavior of liquidity traders in the presence of discrete pricing restrictions.

[3] There are exceptions to this restriction and more recently the NYSE has initiated a move toward decimal trading.

[4] The "true" equilibrium price is the market value of the asset conditional on all publicly available information in an otherwise identical continuous-price economy without any frictions (transaction costs).

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