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Waiting costs and limit order book liquidity: Evidence from the ex-dividend deadline in Australia[☆]

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ABSTRACT

In theoretical models of limit order books populated with liquidity traders there is a link between order aggressiveness, spreads, and the cost of waiting for execution. We directly test these models using an experimental setting where waiting time is important for traders, namely the ex-dividend day. Consistent with these models, we find that order placement is more aggressive before stocks begin trading ex-dividend. Stocks with higher expected costs of delaying execution experience larger declines in order aggressiveness from the cum-day to the ex-day. Waiting costs also impact effective bid-ask spreads, which fall on the cum-day before rising on the ex-day.

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1. Introduction

We test the predictions of recent limit order market models developed by Foucault, Kadan, and Kandel (2005) and Roşu (2009) where the cost of waiting to trade is important. Such models are difficult to test empirically because they describe settings where only uninformed participants trade. To overcome these difficulties, we examine how waiting costs impact order choice, order

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aggressiveness, market depth, and bid-ask spreads around ex-dividend days on the Australian Securities Exchange (ASX).²

Australia's imputation tax system plays an important role in the value that investors place on dividends. Corporations are able to provide investors with imputation tax credits attached to dividend payments if the corporation has paid corporate tax in Australia. Investors with a tax liability in Australia are able to use the imputation tax credits to reduce their personal tax liability. In effect, the corporate tax paid is a pre-collection of personal tax. As a result, the imputation tax system creates two distinct clienteles. Domestic investors are able to utilize the credits and reduce their personal tax liability. On the other hand, foreign investors without an Australian tax liability will be unable to utilize the credits and will therefore place a relatively lower value on the dividend payment in after-tax terms. To be eligible for the imputation tax credits, investors need to own the security at the close of trading on the cum-dividend day.

This setting has several distinct advantages. First, the ex-dividend day represents a corporate event where traders face a deadline, liquidity-motivated traders are active, and informed traders are not, which is consistent with model settings. Second, the theoretical models describe a setting where traders have subjective differences in valuation, which leads to gains from trade. The differential tax treatment of dividend income for investors provides a distinct institutional setting that drives differences in valuation that are unrelated to private information. Third, theoretical models can be used to describe a market where traders differ in patience, with the relative proportion of patient and impatient traders influencing market outcomes. The ex-dividend day provides a setting where the relative proportions of patient and impatient traders are expected to change in a predictable manner, given the existence of dividend clienteles (Elton and Gruber, 1970; Lakonishok and Vermaelen, 1986; Richardson, Sefcik, and Thompson, 1986; Michaely and Vila, 1995; Rantapuska, 2008). With approximately two-thirds of Australian equities held by domestic investors, coupled with an imputation tax system, we anticipate that clienteles will be prevalent in the Australian market and that their trading behavior will change around the ex-day.³ Our analysis of trading and order choice around the ex-dividend day, together with the detailed ASX data for over nearly two decades, provides a unique setting to test theories where liquidity traders face execution risk.

We hypothesize that waiting costs should be higher on the cum-dividend day relative to other days, in light of the impending ex-dividend deadline to trade and the after-tax return that is potentially forgone. For example, Rantapuska (2008) shows that market participants in Finland earn an average overnight return of 2% from the cum-day to the ex-day. Larger waiting costs will induce more competition in the order book from limit order traders, leading to more aggressively priced orders and a narrowing of the bid-ask spread. On the ex-dividend day, waiting costs will be relatively lower in the absence of a trading deadline. With relatively lower waiting costs, the bid-ask spread should be wider as limit orders do not need to be priced as aggressively. We are also able to test our hypotheses in the cross-section of dividend payments, as the level of imputation tax varies across dividend payments from zero to 100%, depending upon the proportion of corporate tax paid on corporation income. If waiting costs are important, we expect the changes in order aggressiveness and spreads between the cum- and ex-days to be more pronounced in stocks whose dividend payments carry a full imputation tax credit. This tax-driven wedge in valuations should encourage liquidity trading and create a higher opportunity cost of not trading for full imputation stocks relative to stocks paying dividends with no imputation. The literature on ex-dividend day valuation and trading also shows that stocks with higher dividend yields and lower transaction costs are likely to attract liquidity traders (Kalay, 1982; Boyd and Jagannathan, 1994), and we anticipate order choice and spread changes to vary with these two characteristics.

² Theoretical studies of order choice include Parlour (1998), Foucault (1999), Goettler, Parlour, and Rajan (2005, 2009). Empirical studies include Biais, Hillion, and Spatt (1995), Harris and Hasbrouck (1996), Lo, MacKinlay, and Zhang (2002), Rinaldo (2004), Anand, Chakravarty, and Martell (2005), Bloomfield, O'Hara, and Saar (2005), Ellul et al. (2007), Cao, Hansch, and Wang (2008), and Bessembinder, Panayides, and Venkataraman (2009).

³ See Appendix A for a description of the data underlying the domestic/foreign holdings breakdown.

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