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Journal of Financial Intermediation 12 (2003) 121–148
Journal of Financial Intermediation
www.elsevier.com/locate/jfi

The effect of decimalization on the components of the bid-ask spread

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Received 28 May 2002

Abstract

Previous empirical studies that decompose the bid-ask spread were done when securities traded in discrete price points equal to one-sixteenth or one-eighth of a dollar. These studies concluded that inventory and adverse-selection costs were economically insignificant compared to order-processing costs. Natural questions arise as to: (i) whether price discreteness allowed market makers to enjoy excess rents, thus reducing the significance of the inventory and adverse selection costs; (ii) whether discreteness decreased the traders' incentives to gather information; or (iii) whether methodologies previously employed mis-estimated the inventory and the adverse-selection costs. We show that the recent conversion to decimal pricing results in significantly tighter spreads. However, the dollar value of spreads attributed to adverse selection and inventory costs do not change significantly. Almost all of the reduction occurs in the order-processing component. As a result, inventory and adverse-selection costs now account for a significantly larger proportion of the traded spreads. A plausible explanation is that the minimum tick size constraint previously in place under fractional pricing allowed market makers to enjoy spreads that were larger than their actual costs.

JEL classification: G14; G19; N20

Keywords: Decimalization; Bid-ask spread components; Market-maker rents

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1042-9573/03/$ – see front matter
doi:10.1016/S1042-9573(03)00017-2

1. Introduction

Theoretical researchers of market microstructure have made significant strides in understanding the role of adverse-selection costs and inventory-holding costs in determining bid-ask spreads.[1] Recent empirical research, however, calls into question the economic significance of the contribution that adverse-selection and inventory costs make to observed bid-ask spreads.[2] Importantly, these studies were conducted when securities traded in discrete price points equal to one-sixteenth or one-eighth of a dollar. With the well-publicized conversion by the major exchanges and NASDAQ to decimal pricing from fractional pricing, the one-cent minimum tick size now in place has reshaped the trading environment for market makers and investors, creating the potential for systematic changes in spreads. Natural questions arise as to whether price-discreteness was responsible for the observed economic insignificance of the inventory and adverse-selection costs. In this article, we examine how the size of each of the various components that together comprise the traded spread changed with the conversion to decimal pricing. This decomposition allows us to answer questions as to: (i) whether price-discreteness allowed market makers to enjoy excess rents which were relatively large in comparison; (ii) whether discreteness decreased the traders' incentives to gather information; or (iii) whether methodologies previously employed were unable to detect these costs due to discreteness.

Our research complements several recent studies that examine how decimalization affected market quality and trade execution costs. Bessembinder (2002) finds no degradation after conversion in a number of market quality measures (including quote sizes, competitiveness of quotes originating off the listing market, intraday return volatility, and systematic intraday quote changes).[3] Bacidore et al. (2001) report evidence of thinner limit order books after decimalization, but no evidence of this decrease in committed liquidity adversely affecting traditional measures of execution quality. With respect to trade execution costs, the aforementioned studies along with Chung et al. (2001), NASDAQ (2001), and NYSE (2001) all document significant decreases in quoted spreads, effective spreads, and/or realized spreads with the conversion to decimalization. Our contribution to this literature is to examine how the component parts that together comprise traded spreads changed under decimalization.

Our research also complements Bacidore's (1997) study of the Toronto Stock Exchange's (TSE's) conversion to a reduced tick size.[4] Bacidore focuses on the impact of this change on the market quality, specifically market depth and liquidity. He finds that

[1] For example, Kyle (1985), Glosten and Milgrom (1985), Easley and O'Hara (1987), Admati and Pfleiderer (1988) provided pioneering models of adverse selection in securities' trading. For papers studying the inventory holding costs, see Demsetz (1968), Stoll (1978), Ho and Stoll (1981), and Ho and Stoll (1983).

[2] George et al. (1991), for example, report that only 8 to 13 percent of the quoted spread was attributable to adverse-selection costs. In the same vein, Huang and Stoll (1997) find that on average about 38 percent of traded spreads were attributable to inventory and adverse-selection costs. Similar evidence is provided by Madhavan et al. (1997) and Cao et al. (1997).

[3] Bessembinder (2000) obtains similar results when he analyzes spreads for NASDAQ stocks that experienced tick size changes as their share prices passed through the $10 mark.

[4] The TSE converted from a one-eighth-dollar to a five-cent minimum tick size for stocks priced above five dollars and to a decimal tick size for stocks priced below five dollars.