A simple approximation of intraday spreads using daily data ☆

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Abstract

This study examines the relation between the bid-ask spread from the daily CRSP data and the bid-ask spread from the intraday TAQ data. We show that the CRSP-based spread is highly correlated with the TAQ-based spread across stocks using data from 1993 through 2009. The simple CRSP-based spread provides a better approximation of the TAQ-based spread than all other low-frequency liquidity measures in cross-sectional settings. However, the CRSP-based spread is highly correlated with the TAQ spread in time-series settings only for NASDAQ stocks. Overall, our results suggest that the simple CRSP-based spread could be used in lieu of the TAQ-based spread in academic research that focuses on cross-sectional analysis.
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1. Introduction

The bid-ask spread is a measure of stock market liquidity that has been frequently employed in market microstructure studies. For example, previous studies (e.g., Christie and Schultz, 1994; Huang and Stoll, 1996; Bessembinder, 2003a) use the bid-ask spread to perform inter-market comparisons of trading costs. In addition, market regulators implement various rules and regulations to reduce the cost of trading, and subsequently assess the efficacy of these rules and regulations by analyzing their impact on the bid-ask spread. For instance, the U.S. Securities and Exchange Commission (SEC) reduced the minimum price variation (i.e., tick size) from $1/8th to $1/16th in 1997 and again from $1/16th to one cent in 2001 with the specific purpose of reducing the bid-ask spread in the U.S. securities markets. Similarly, the SEC enacted the Limit Order Display Rule in an effort to reduce the inside spread of NASDAQ-listed stocks.[2]

Most prior market microstructure research relied on the Trade and Quote (TAQ) data provided by the New York Stock Exchange (NYSE), which involves a tedious process of data downloading, error filtering, and variable calculation. In this study, we propose an alternative method of calculating the bid-ask spread that requires only daily data and minimal computational efforts. Our simple liquidity measure would be useful to those who do not have an access to the TAQ database and/or those who want to incorporate stock market liquidity in their research without having to go through the process that is required for the TAQ database. Our simple liquidity measure is readily available for NYSE/AMEX/NASDAQ stocks from 1993 onwards, which coincides with the time period covered by the TAQ database. Another possible advantage of our simple liquidity measure is its availability beyond the time period covered by the TAQ database: one can easily obtain our low-frequency bid-ask spread measure from 1925 to 1942 for all NYSE/AMEX stocks and from 1982 to 1992 for most NASDAQ stocks.[3]

Despite its usefulness as a measure of stock market liquidity and information asymmetry, the usage of the TAQ-based bid-ask spread in other research areas has been limited due, at least in part, to data availability problems. Our study is mainly motivated by the need for readily available liquidity measures in other research areas, such as corporate finance, financial accounting, and asset pricing. Researchers in these areas show that liquidity plays an important role in many financial decisions and the pricing of assets.

For example, prior research underscores possible interactions between stock market liquidity and (1) capital structure (Frieder and Martell, 2006; Lipson and Mortal, 2009), (2) dividend payout and stock repurchase decisions (Banerjee, Gatchev, and Spindt, 2007; Brockman, Howe, and Mortal, 2008), (3) ownership structure (Heflin and Shaw, 2000; Sarin, Shastri, and Shastri, 2000; Brockman, Chung, and Yan, 2009), (4) firm value (Fang, Noe, and Tice, 2009), (5) corporate governance (Chung, Elder, and Kim, 2010), (6) executive compensation (Jayaraman and Milbourn, 2012), (7) corporate innovation (Fang, Tian, and Tice, 2013), (8) institutional investors' stock selection decisions (Falkenstein, 1996; Chung and Zhang, 2011; Huang, 2013), and (9) asset pricing (Amihud and Mendelson, 1986; Spiegel and Wang, 2005).[4] Readily

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[2] See Barclay, Christie, Harris, Kandel, and Schultz (1999) for empirical evidence.

[3] Our simple liquidity measure could be useful to researchers who are interested in the analysis of the 1929 stock market crash.

[4] The bid-ask spread is also widely used as a proxy for market liquidity and information asymmetry in accounting literature (e.g., Greenstein and Sami, 1994; Kim and Verrecchia, 1994; Welker, 1995; Coller and Yohn, 1997; Healy, Hutton, and Palepu, 1999; Leuz and Verrecchia, 2000; Leuz, 2003; Guo, Lev, and Zhou, 2004; Mohd, 2005; Chang, Chen, Liao, and Mishra, 2006; Ali, Chen, and Radhakrishnan, 2007; Jayaraman, 2008; Bushee, Core, Guay, and Hamm, 2010; and Cheng, Dhaliwal, and Neamtiu, 2011).