Journal of Accounting and Economics 52 (2011) 126–143

Contents lists available at ScienceDirect

Journal of Accounting and Economics

journal homepage: www.elsevier.com/locate/jae

The effect of information quality on liquidity risk ☆

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ARTICLE INFO

Available online 29 March 2011

JEL classification:
G01
G11
G12
G14
M41

Keywords:
Information quality
Earnings quality
Liquidity risk
Cost of capital
Disclosure

ABSTRACT

I investigate whether information quality affects the cost of equity capital through liquidity risk. Liquidity risk is the sensitivity of stock returns to unexpected changes in market liquidity; recent asset pricing literature has emphasized the importance of this systematic risk. I find that higher information quality is associated with lower liquidity risk and that the reduction in cost of capital due to this association is economically significant. I also find that the negative association between information quality and liquidity risk is stronger in times of large shocks to market liquidity.

1. Introduction and hypothesis

In this study, I investigate the relation between information quality and liquidity risk, with liquidity risk defined as the sensitivity of stock returns to unexpected changes in market liquidity (Pastor and Stambaugh, 2003; Acharya and Pedersen, 2005; Sadka, 2006). This study is motivated by Lambert et al. (2007), who suggest that higher information quality, i.e., more precise signals, lowers market risk and thus cost of capital in the traditional Capital Asset Pricing Model (CAPM) framework. The CAPM assumes perfect liquidity, which means that there are always market participants willing to take the opposite position of any trade at the current price. Consequently a firm's share price is simply a function of expectations about the firm's cash flow. With imperfect liquidity, the demand and supply of shares by some market participants could affect prices if others are not willing to trade at the current prices. While market risk exists in both perfectly and imperfectly liquid markets, liquidity risk is an additional and important systematic risk that investors face when markets are not perfectly liquid (Pastor and Stambaugh, 2003; Acharya and Pedersen, 2005; Sadka, 2006).[1]

☆ I thank my dissertation chair, John Core, and members of my dissertation committee, Robert Holthausen, Richard Lambert, Craig MacKinlay, and Robert Verrecchia for their much appreciated guidance. I also thank Michael Boldin, Brian Bushee, Gavin Cassar, Nick Gonedes, Michelle Hanlon, S.P. Kothari, Tjomme Rusticus, Cathy Schrand, Lloyd Tanlu, Rodrigo Verdi, Regina Wittenberg-Moerman, Ronnie Sadka (discussant at the 2010 JAE conference), Joe Weber, Jerry Zimmerman (the editor) and workshop participants at the 2007 London Business School Trans-Atlantic Doctoral Conference, 2010 JAE conference, the University of Pennsylvania, Carnegie Mellon University, the Ohio State University, Dartmouth College, the University of North Carolina, MIT, Northwestern University, the University of Michigan, the University of Utah, Stanford University, Yale University, and Washington University of St. Louis for their helpful comments. I appreciate the financial support of the Wharton School of the University of Pennsylvania and MIT Sloan School of Management. I am also grateful for the financial support from the Deloitte & Touche Foundation.

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[1] Pastor and Stambaugh (2003) find that the required return (i.e., cost of capital) for stocks with high sensitivities to unexpected changes in market liquidity exceeds that for stocks with low sensitivities by 7.5%, after adjusting for exposures to the market return, size, value, and momentum factors.

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doi:10.1016/j.jacceco.2011.03.004

I hypothesize that higher information quality lowers liquidity risk, which, in turn, lowers cost of capital. I define information quality as an information characteristic of a firm that affects the degree of (i) uncertainty over the firm's value and/or (ii) adverse selection when trades in the firm's stock occur (Healy and Palepu, 2001; Verrecchia, 2001; Easley et al., 2002; Easley and O'Hara, 2004).

To the best of my knowledge a theoretical model that directly links information quality (or information risk) to liquidity risk is not available, but the intuition is as follows. Systematic risk is a covariation/sensitivity effect; a stock with higher systematic risk will perform relatively worse during bad macroeconomic conditions, but relatively better during good ones (Campbell et al., 1997). For liquidity risk, the relevant macroeconomic condition is market liquidity. Market liquidity reflects, at the aggregated market level, the ability to trade large quantities quickly, at low cost, and without moving the price (Pastor and Stambaugh, 2003). A decline in market liquidity typically reflects a macroeconomic state in which there is investor and market maker outflow from the equity markets amidst high market volatility and risk aversion; in the extreme, this is known as a flight to quality/safety (e.g., Chordia et al., 2000; Pastor and Stambaugh, 2003; Acharya and Pedersen, 2005; Brunnermeier and Pedersen, 2009).

When market liquidity declines, different stocks will experience different degrees of investor and market maker outflow. In particular, the outflow is likely to be more significant for stocks with lower information quality because of a decline in investor demand for stocks associated with greater uncertainty and adverse selection. Market makers are also less willing to provide liquidity to such stocks due to concerns about adverse selection; this, in turn, might further dampen investor's demand for these stocks. Hence, these stocks perform worse when market liquidity declines. In contrast, when market liquidity increases, there is an inflow of investors and market makers, which increases the demand and liquidity of stocks associated with greater uncertainty and adverse selection. Note that the earlier arguments imply that the demand for stocks with higher information quality is subject to less fluctuation conditional on market liquidity changes. Thus, the returns of stocks with lower information quality (i.e., higher information risk) are expected to be more sensitive to changes in market liquidity. That is, information quality contributes to liquidity risk.

Models on disclosure typically characterize information quality as the precision of a signal of firm value, with more precise (i.e., lower variance) signals being of higher quality (Verrecchia, 2001). Thus, in order to closely match empirical proxies to the theoretical characterization of information quality, I identify measures that capture the precision of an earnings signal. Specifically, I use *Earnings precision*, *Accruals quality*, and *Analyst consensus* as proxies for information quality (see Section 3 for a detailed description of the proxies).

I investigate the relation between information quality and liquidity risk by examining how information quality contributes to the liquidity risk of ordinary shares of stocks listed on NYSE, AMEX, or NASDAQ from January 1983 to December 2008 after controlling for market characteristics (e.g., liquidity, trading volume, and return volatility) and firm characteristics (e.g., sales growth, operating cycle, and capital intensity) that might be associated with either liquidity risk or information quality (e.g., Dechow and Dichev, 2002; Francis et al., 2005; LaFond et al., 2007; Dichev and Tang, 2009). I find evidence of a negative association between information quality and liquidity risk. In particular, *Earnings precision*, *Accruals quality*, and *Analyst consensus each* are individually negatively associated with liquidity risk. The association between *Aggregate quality*, which combines *Earnings precision*, *Accruals quality*, and *Analyst consensus*, and liquidity risk is also negative and statistically significant.

Next, I examine the economic significance of the effect of information quality on cost of capital through liquidity risk. As a benchmark, I also compare this effect on cost of capital through market risk (Lambert et al., 2007). I find that the economic effect of higher information quality in lowering cost of capital through liquidity risk is economically significant and larger than that obtained through market risk. For example, an analysis with *Aggregate Quality* indicates that firms in the top quintile have a cost of capital that is lower by 269 (57) basis points due to lower liquidity risk (market risk), compared to those in the bottom quintile of information quality.[2]

I then explore differences in the relation between information quality and liquidity risk in three different periods: (i) periods of extreme decreases in market liquidity, (ii) periods of extreme increases in market liquidity, and (iii) periods of relatively stable market liquidity. I find a stronger negative association between information quality and liquidity risk in times of large, unexpected changes in market liquidity. One interpretation of this finding is that when investors decide whether to exit and enter certain stocks in times of market liquidity shocks, they pay more attention to the quality of information about the stocks.

Finally, I run a battery of robustness analyses. I find that the negative association between information quality and liquidity risk is robust to the use of alternative information quality proxies, namely earnings smoothness, analyst forecast consensus scaled by consensus mean forecast, and analyst forecast consensus scaled by consensus median forecast. I also find this negative association to be robust to the inclusion of firm-fixed effects, as well as to the inclusion of the historical

(*footnote continued*)
They also show that this effect is distinct from the pricing of liquidity (Amihud and Mendelson, 1986; Brennan and Subrahmanyam, 1996). The difference between liquidity risk and liquidity is further discussed in Section 2.

[2] The magnitudes of the cost of capital effects documented in my paper are comparable to those documented in the prior literature (e.g., Francis et al., 2004, 2005). See Section 4.3 for a more detailed discussion.