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Market reaction to earnings news: A unified test of information risk and transaction costs[☆]

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ABSTRACT

We examine how information risk and transaction costs influence the initial and subsequent market reaction to earnings news. We find that the initial market reaction is higher per unit of earnings surprise for higher information risk firms (information content effect). Furthermore, it is information risk that induces transaction costs that limit the initial market reaction and lead to higher subsequent drift (transaction costs effect). Information risk does not have an effect on drift beyond that achieved through transaction costs. Our findings highlight the importance of understanding the linkage between information risk and transaction costs in price discovery around public disclosure.

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1. Introduction

While the information risk (Zhang, 2006; Mendenhall, 2004; Garfinkel and Sokobin, 2006) and transaction cost (Ke and Ramalingegowda, 2005; Sadka, 2006; Ng et al., 2008; Chordia et al., 2009) literatures offer two interrelated explanations of price discovery around and after earnings announcements, the hypotheses related to these explanations do not necessarily have the same predictions with regard to market returns during and subsequent to earnings news. Building on the existing literatures, the purpose of this paper is to analyze, within a unified framework, the effects of information risk and transaction cost explanations of price discovery around and after earnings announcements.

In terms of the initial market reaction, we propose two hypotheses regarding the role of information risk. First, we posit that information risk reduces the informativeness of price and raises the relative importance of public announcements in the price discovery process (see Kim and Verrecchia, 1991), and that, therefore, the initial market reaction is higher per unit of earnings surprise. We call this the *Information Content hypothesis*. Second, regarding the indirect impact of information risk, we hypothesize that information risk induces a higher level of transaction costs, and this constrains the initial market

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reaction to earnings surprises. Firms with higher information risk are those with less public information and more privately informed investors, and hence transaction costs are higher (see, e.g., Copeland and Galai, 1983; Glosten and Milgrom, 1985; Kyle, 1985). Furthermore, transaction costs have been deemed to constrain and slow down price discovery (Oehmke, 2011; Roll et al., 2007). Therefore, we expect firms with higher information risk to have higher transaction costs, leading to a lower initial market reaction to the earnings surprise. We call this the *Transaction Cost hypothesis*.

From the above hypotheses concerning the initial market reaction, we then extend our hypothesis development to consider their implications for the long-term price drift. The prediction of the Information Content hypothesis is only effective at the time of the public information announcement, when new information helps to revise the price level of the stock. Given that the *impact of this prediction* on the initial market reaction is driven by fundamental information (and can be seen as a permanent shift in the price level), the hypothesis predicts no direct relationship between information risk and subsequent drift. In contrast, for the Transaction Cost hypothesis, the transaction cost effect on the initial market reaction will be corrected through the price movement driven by the gradual incorporation of the earnings surprise information by market participants. It, therefore, predicts that transaction costs will be positively correlated with the size of drift.

Empirically, we perform a unified analysis using 4,445 US stocks for the period 1993 to 2007. For the key measures of information risk, we build on the existing literature to extract three common factors from eight proxies of information risk. By producing a reduced set of uncorrelated factors this process solves the multicollinearity problem when using these proxies together in a regression analysis. In addition, it helps to identify the common dimensions represented by these proxies. Specifically, the first factor is a measure of volatility, encompassing the level of information uncertainty and arbitrage risk. The second factor is a measure of opinion divergence, capturing the level of *ex ante* market disagreement (Garfinkel and Sokobin, 2006). The final factor is a measure of size, capturing the major effects normally associated with size; namely, market capitalization, analyst coverage and age. For the transaction cost measures we adopt both the percentage bid–ask spread (*BAS*) and the limited dependent variable (*LDV*) proposed by Lesmond et al. (1999).

To test the initial market reaction we use earnings response coefficient (ERC) analysis to examine the interactive effect between information risk/transaction costs and earnings surprises. Recognizing and empirically demonstrating that information risk is a key determinant of transaction costs, we use the generalized method of moments (GMM) to estimate both the ERC and cost determinant equations simultaneously to obtain robust estimates of the system. Our results for the initial market reaction analysis show that ERCs are higher for firms with higher information risk factors controlling for the transaction costs effect. This finding supports the Information Content hypothesis, that per unit of earnings surprises from firms with higher information risk have higher price impact. Furthermore, for both measures of transaction costs, we show a direct negative impact on ERCs, which supports the Transaction Cost hypothesis. In addition, without controlling for transaction costs, coefficients on the information risk factors capture both the positive information content and negative transaction costs effect and the observed combined effect is positive. When the negative effect of transaction costs is properly controlled for, the coefficients of the information risk factors capture only the information content effect which is positive and higher in magnitude. This finding further supports the links between information risk and transaction costs. Overall, these results are robust to controls which have been identified to be relevant to ERCs in the existing literature (e.g., Subramanyam and Wild, 1996; Blouin et al., 2003; Wilson, 2008) and to alternative measurement periods for the initial market response.

Analysis of the initial market reaction alone cannot, however, yield unambiguous conclusions about the effects of information risk and transaction costs on price discovery. Our analyses of the post-announcement returns are, therefore, designed to further test the information content and transaction cost hypotheses.¹ Using traditional asset pricing regressions we examine whether information risk and transaction costs explain post-announcement expected returns. Specifically, using Fama and MacBeth (1973) quarter-by-quarter regressions, we find that if the transaction cost effect is not controlled for, firms with higher information risk experience a higher level of drift which is consistent with previous studies (Zhang, 2006; Garfinkel and Sokobin, 2006). When a transaction cost measure is included in the equation, the relationship between information risk factors and post-announcement drift disappears. Importantly, the size of drift is found to be significantly and positively related to transaction costs. These findings provide strong support for the Transaction Cost hypothesis and furthermore, the fact that information risk plays no additional role in explaining post-announcement returns is also consistent with the Information Content hypothesis. These results are robust to alternative post-announcement returns ranging from one quarter to one year post earnings announcement and control variables that the prior literature identifies as influencing Post Earnings Announcement Drift (PEAD).

Our final analysis further examines the connection between information risk and transaction costs by considering how transaction costs affect the returns of hedged PEAD portfolios. If transaction costs bridge the connection between information risk and post-announcement returns, we would expect PEAD portfolio returns to be higher for portfolios of firms with higher information risk, before considering transaction costs. Once transaction costs are deducted from the PEAD portfolios, the relationship between the portfolio return and the information risk level of the constituent firms should disappear; this is because the trading of higher information risk stocks would incur higher transaction costs. We find strong support for this conjecture in the analyses of the quarterly information-risk-sorted hedged PEAD portfolio before and after

¹ A higher initial market reaction cannot be seen as evidence of lower or no underreaction, nor can it be interpreted as overreaction. We thank the referee for highlighting this important point.

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