

Price Discovery in Spot and Derivative Equity Markets

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Abstract

The study considers the role of the derivative markets in the price discovery process around the release of firm-specific announcements, for ASX (Australian Stock Exchange) stocks with traded options and/or warrants. Furthermore, the project examines various factors that influence this role, such as announcement and option types. Most importantly, the current study also investigates the link between investor characteristics (specifically institutional trading activity and the geographical origin of transactions) and dynamics of the intraday price behaviour.

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1. Introduction

This study will investigate the intraday trading behaviour of securities listed on the ASX. In particular, the part that the option and warrant markets play in the price discovery process around the release of firm-specific announcements, and the factors that influence this role. Firstly, we determine whether informed trading occurs on the derivative markets by applying an extension of the “information share” approach developed by Hasbrouck (1995) (see Chakravarty, Gulen, & Mayhew, 2004 and Anand & Chakravarty, 2005) to securities with traded options and/or warrants. Secondly, both daily and intraday information shares are documented for the period prior to, as well as following, each announcement. An investigation into the impact of several variables which may influence the proportion of new information that is incorporated via the derivative markets forms the third focus for this study. These include market-specific factors (relative liquidity and trading costs), option characteristics like “money-ness”, and announcement types¹. Additionally, we consider the impact of spot market institutional trading activity and geographical origin of trades (investor location), on proportional information shares. To our knowledge, while these have been recognised as important issues (for instance Grinblatt & Keloharju, 2001), this will be the first study to directly examine the relation between such investor characteristics and price discovery.

There is considerable academic discussion relating to the dynamics of the interaction between stock and derivative markets (see Easley, O'Hara, & Srinivas, 1998; Lee & Yi, 2001 among others). However, conflicting results have been obtained. In addition, there is a lack of direct evidence about the role of each market in the price discovery process. An exception is

¹ Different types of announcements, as well as whether the information content is “positive” or “negative”.

Chakravarty, Gulen & Mayhew (2004), who conduct a direct investigation of price discovery occurring on each market but do not explore the issue in relation to particular corporate announcements. More recently, Collver (2005) documents price discovery on the stock and option markets during the release of earnings announcements. However, Collver (2005) focuses only on earnings announcements over 6-months in 1995, whereas we will consider a wide range of announcement types over a much longer (and recent) period. Furthermore, we include stocks with traded warrants, as well as the various factors that may have an influence on intraday price movements.

2. Significance and Innovation

The study aims to contribute knowledge in the area of linkages between the derivatives and underlying markets, which will benefit both the academic and financial communities. The latter include investors who trade in both shares and derivatives, as well as those who are active in only one market. For instance, if the findings show that the option market contributes significantly to price discovery, this indicates that some information is first reflected in that market, and movements in these markets will be of interest to investors trading the underlying shares. Further, an understanding of where informed traders choose to trade and the factors influencing this choice, are relevant to market makers and regulators (for example, in helping to prevent illegal insider trades). For example, a knowledge of the ‘informative-ness’ of orders will aid option market makers in managing the risks from adverse selection. In addition, an analysis of the origin of information-based trading activity will be of relevance to both policy makers and exchange regulators.

Increasing activity in the derivative markets shows that many investors do in fact trade in the derivatives markets. Further, for the ASX, as with many of the major exchanges, the largest and most liquid stocks also have traded derivatives. This emphasises the importance of a greater understanding of the price discovery dynamics of such securities. However, extant research has produced conflicting results. Moreover, there is scarce direct evidence into the role of the derivative markets in the dissemination of information, especially true studies using Australian data. Therefore, the primary motivation is to fill this gap in the literature and contribute to a greater understanding of these issues. We also hope to shed more light on the factors that influence where informed traders trade, particularly in the periods surrounding news releases. The ASX is chosen primarily because of the richness and precision of the data available. Another motivation is to provide an improved methodology. Specifically, we adapt Chakravarty et al. (2004)'s application of the Hasbrouck's (1995) 'information share' approach in several ways. Firstly, we focus on announcement periods, specifically documenting both inter-day and intraday impact of news releases on the price discovery mechanism. Moreover, additional testing is carried out to determine the factors that affect the relative proportion of informational-based trading occurring in each market. The data also allow us to investigate the role of institutional trade and investor location.

3. Data and Methodology

The analysis will be based on transactions in each relevant market for the top 50 stocks by market capitalisation, from January 1996 to December 2005. Data including buying/selling broker information (by special request from ASX), and 'Signal G' announcement data will be obtained from SIRCA. I/B/E/S will be used to collect analyst forecasts. Price discovery will be 'measured' using the approach outlined by Hasbrouck (1995), where an "information share" (IS) for each market is calculated based on their relative contributions to the common efficient price. We first

estimate daily individual market IS for each stock, using VAR lags of up to 300 seconds and polynomial distributed lags. Intraday quote data from each relevant market is used for this analysis. IS bounds for each stock are obtained by calculating time series averages of these daily values. Trade origin is proxied by broker location; when institutional trades are not identified, we apply Aitken and Frino's (1996) algorithm. Analysis into the influences on the price discovery process will be done by considering IS for certain periods/groups, and by means of cross-sectional regression models.

4. Expected Outcomes

- Refereed international conference publications (articles to be submitted to leading international finance conferences held in late 2006/early 2007)
- Refereed journal article(s). The article(s) will be submitted to top-tier (three) finance journals
- Funding for a proposed Linkage or DP ARC grant

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