



# Return predictability following different drivers of large price changes



Vinay Patel <sup>\*</sup>, David Michayluk

Discipline of Finance, University of Technology Sydney, PO Box 123, Broadway, NSW 2007, Australia

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## ABSTRACT

This study uniquely examines return predictability following different drivers of large price changes. We use several novel features of the Australian information generation environment to overcome identification issues of large price changes inherent in earlier studies. In contrast to prior results, we find that large price changes are permanent when they are driven by public information consistent with the semi-strong efficient markets hypothesis and also when driven by private information. For large price changes which do not correspond with information, we show that investors could profit from the subsequent over-reaction in returns.

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## 1. Introduction

In the current literature there is contrasting evidence regarding the circumstances which lead to the under- and over-reaction of returns following large price changes in US markets. De Bondt and Thaler (1985) were one of the first to hypothesize that investors overreact as returns significantly reverse in the three to five year period following portfolio formation. A number of studies also document that returns exhibit reversal in the shorter term, specifically in the 20 days following large price changes (Bremer & Sweeney, 1991; Park, 1995; Bremer, Hiraki, & Sweeney, 1997; Pham, Nguyen, & Tô, 2009).<sup>1</sup> In contrast, several studies reject the over-reaction hypothesis developed by De Bondt and Thaler (1985). Specifically, Brown, Harlow, and Tinic (1988) find evidence to support their uncertain information hypothesis (UIH), while Atkins and Dyl (1990) and Cox and Peterson (1994) document that the reversal in returns is non-existent after controlling for the bid ask bounce, market illiquidity and transaction costs.<sup>2</sup>

More recently, several US studies examine the impact of public information upon the subsequent patterns in returns following large price changes (Pritamani & Singal, 2001; Chan, 2003; Savor, 2012). All of these studies document that returns underreact following large price

changes driven by public information which is inconsistent with Fama's (1970) semi-strong efficient markets hypothesis. Further, returns are also found to overreact following large price changes which do not correspond with the release of public information.

In this study we utilize the unique information generation environment in Australia to examine return predictability following large price changes. Large price changes may occur for a number of reasons including: the release of public information, investor sentiment, liquidity trading, liquidity shocks or private information. We investigate return predictability following large price changes to examine whether the under-/over-reaction phenomenon differs between countries and whether any differences can be attributed to the dispersed nature of the information environment in the US. In addition to public information, we extend the literature by simultaneously looking at return predictability following other drivers of large price changes including liquidity trading and private information.

Using the Australian market to examine return predictability following large price changes is advantageous for several reasons. First, in contrast to the secondary sources of US data used by Pritamani and Singal (2001) and Chan (2003), all public firm-specific information is centrally disseminated from a primary source – the Australian Securities Exchange (ASX).<sup>3</sup> Under ASX Listing Rule 3.1, all listed firms are required to immediately disclose all material information to the ASX and thus

<sup>\*</sup> Corresponding author.

E-mail addresses: [puissant.b@chu-toulouse.fr](mailto:puissant.b@chu-toulouse.fr), [Vinay.patel@uts.edu.au](mailto:Vinay.patel@uts.edu.au) (V. Patel), [David.michayluk@uts.edu.au](mailto:David.michayluk@uts.edu.au) (D. Michayluk).

<sup>1</sup> Bremer et al. (1997) examine Nikkei 300 listed stocks and Pham et al. (2009) examine Australian Securities Exchange 100 listed stocks.

<sup>2</sup> The UIH predicts that regardless of the sign of the large price change, firm risk and expected return will increase and will result in subsequent drift (or under-reaction) in returns.

<sup>3</sup> The US secondary sources for public information used in these studies are obtained from the Dow Jones Interactive Publications Library which consists of the following sources: The Wall Street Journal, Associated Press Newswire, The Chicago Tribune, The Globe and Mail, Gannett News Service, The Los Angeles Times, The New York Times, The Washington Post, USA Today and Dow Jones newswires.

to the public. In comparison, Regulation Fair Disclosure ensures information is fairly disseminated, but does not necessarily require the immediate disclosure of information.<sup>4</sup> Information can be disclosed to the public through a variety of channels including firm websites, press releases or by Form 8-K which allows between one to four business days before filing for each type of announcement.<sup>5</sup> The precise timing of announcements upon one centralized platform in Australia allows us to accurately identify when public information is released and widely disseminated so that we can cleanly associate public information with large price changes.

Second, there is a special category of ASX announcements that identifies those announcements that contain price sensitive material information. This classification allows us to overcome another shortcoming of Pritamani and Singal (2001) and Chan (2003) in which the authors cannot be certain that a particular news item contains material information about a firm's fundamental value.

Third, also under ASX Listing Rule 3.1 the ASX issues price queries when there is a large price change that does not correspond with the dissemination of an official ASX announcement (Australian Securities Exchange Group, 2012). We use ASX price queries that coincide with and/or follow large price changes to create a cleaner sample of price events which are not explained by other public information sources (not captured by our proxy or previous studies' proxies for public information), but likely driven by private information. Our analysis of return predictability following different drivers of large price changes sheds further light on the price discovery process and has practical implications for regulatory bodies concerned by the presence of informed trading.

Our study is most similar to the examination of short-run return predictability following large price changes in the presence and absence of public information conducted by Pritamani and Singal (2001); Chan (2003) and Savor (2012). Pritamani and Singal examine patterns in daily returns for 1.5% of the universe of stocks listed on the NYSE and AMEX after a variety of information signals, including large price changes, increases in trading volume and the dissemination of public information during 1990 to 1992. They suggest that the prior literature does not simultaneously examine the magnitude, precision and dissemination of an information signal. To address this gap in the literature large price changes are used to represent the magnitude of the information signal, increases in volume to represent the precision of the information signal and public information obtained from the Dow Jones Interactive Publications Library as the dissemination of the information signal. For large positive (negative) price changes which simultaneously correspond with increases in volume and the release of public information, the authors document cumulative abnormal returns (CAR) of 2% (–1.68%) in the 20 days following a large price change. Further using unadjusted closing prices, a trading strategy which consists of taking a long (short) position in large positive (negative) information based events accompanied by an increase in volume is found to earn significant annualized abnormal returns of 12–18%.<sup>6</sup>

Using monthly returns, Chan (2003) documents drift in returns following news events (price events accompanied by the release of public information) and reversal in returns following no-news events between 1980 and 2000. In a similar vein to Pritamani and Singal (2001), news story data is obtained from the Dow Jones Interactive Publications Library. Both studies determine whether news is classified as a positive or negative price event by the market reaction to the news story.<sup>7</sup> A

problem with this methodology is that a number of news and no-news events may be misclassified as some news stories may not contain any material information about the fundamental value of a firm.

Savor (2012) provides the most comprehensive study of return predictability following 166,470 large price changes between 1995 and 2009. Unlike Pritamani and Singal (2001) and Chan (2003), analyst recommendations are used as a proxy for public information. The benefit of using analyst recommendations is that large price events are likely to be supplemented with an analyst report, recommendations provide a view on how individuals (or analysts) form expectations about asset values and constitute an intuitive method to determine whether public information can be classified as positive or negative news. Savor finds that when an analyst recommendation is made in the three day window around a large price change, returns exhibit drift following large information based price events and reversal following large no-information based price events over a five to 40 day post-event horizon. Using unadjusted closing prices, a trading strategy which consists of a long (short) position in information winners (information losers) and a long (short) position in no-information losers (no-information winners) is found to earn significant abnormal annualized returns of 36%.

In this study we document evidence which supports public and private information and liquidity trading as drivers of large price changes. We find that 2840 of 6641 (or 43%) of our sample of large price changes can be explained by the release of ASX announcements. Using several trading and liquidity measures we confirm that liquidity trading is associated with 3383 large price changes. Further, the abnormal behavior of adverse selection costs prior to a sample of large price changes which are not accompanied by public information and which coincide with or are followed by an ASX price query, provide evidence to support private information as also being a driver of large price changes.

Our panel regression analysis of large price events on post-event cumulative abnormal returns provides evidence of permanent price changes for large information-based price events (or price events which coincide with the release of ASX announcements). We find similar findings for ASX announcements which contain price sensitive information. Our results suggest that ASX announcements efficiently incorporate information into prices consistent with Fama's (1970) semi-strong efficient markets hypothesis. We also find that large price changes preceded by abnormal adverse selection costs and which generate an ASX price query are also permanent, consistent with the imputation of private information into fundamental value. However, we observe significant reversal (or over-reaction) in returns following large no-information-based price changes (or price events which do not coincide with the release of ASX announcements). This finding is consistent with liquidity trading which creates price pressures that are subsequently reversed when prices deviate from fundamental value (Campbell, Grossman, & Wang, 1993; Avramov, Chordia, & Goyal, 2006).

To test whether investors can profit from the significant over-reaction in returns following large price changes driven by liquidity trading we control for microstructure effects, illiquidity and use adjusted closing prices. Our findings suggest that investors could profit from such predictability in returns. The magnitude of the reversal is around 1.5 times larger when comparing the subsequent patterns in returns calculated using unadjusted and adjusted closing prices. As a result, we suggest that prior US studies which document annualized returns using unadjusted closing prices should be interpreted with caution.

A notable difference between our findings and prior US studies is that we find permanent large information-based price changes rather than subsequent drift (or under-reaction) in returns. In particular, this result can be attributed to several unique features of the Australian information environment including a central information dissemination platform, price sensitive flags and use of trading halts which make it easier for investors to determine the value of information. Our findings suggest an increased level of informational efficiency of prices in Australia and will be of interest to regulators.

<sup>4</sup> In fact, Sidhu, Smith, Whaley, and Willis (2008) find that Regulation Fair Disclosure has reduced the number of disclosures made in the US.

<sup>5</sup> For a list of material corporate events which must be filed using Form 8-K, see <http://www.sec.gov/answers/form8k.htm>.

<sup>6</sup> The authors exclude large price events where a stock split, stock dividend or equity issue was made in the previous 60 days.

<sup>7</sup> In addition, Chan (2003) uses the headline of the news story as an additional determinant of the sign of a price event.

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