Market reaction to takeover rumour in Internet Discussion Sites

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Abstract

We examine the market reaction to takeover rumour postings in the Hotcopper Internet Discussion Site (IDS). Results from the interday analysis show abnormal returns and trading volumes on the day before and the day of the posting. Results of the intraday analysis show abnormal returns and trading volumes during the 10 min posting interval and abnormal trading volume during the 10 min interval immediately preceding it. Sensitivity analyses indicate that the results are robust to concerns regarding potential confounds, credibility and bid–ask spread bias. Taken together, these findings are consistent with the market reacting to the posting of takeover rumours in IDS.

Key words: Internet Discussion Sites; Takeover rumour; Market reaction; Abnormal returns; Abnormal trading volume

JEL classification: G14

doi: 10.1111/j.1467-629X.2006.00160.x

1. Introduction

In financial markets, any information not capable of objective verification can be classified as rumour.\textsuperscript{1} Although many rumours are spread by ‘word of mouth’, there

The authors acknowledge the assistance of the management of Hotcopper, who made available to us their archives, and Macquarie Bank and SIRCA who provided us with the return data. We also thank participants at the 2002 AFAANZ Annual Conference and the 2002 University of Technology, Sydney Summer Research Camp as well as workshop participants at the Australian National University, the University of Melbourne and Monash University, and especially Russell Lundholm, Gordon Richardson, Tom Smith, Robert Whitelaw, Mary Rose Cooney, Jason Hall and Philip Gray for their insights.

\textsuperscript{1} Knapp (1944) defines rumour as ‘a proposition for belief of a topical reference disseminated without official verification’. More recently, Kosfeld (1998) in analysing the term rumour

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also exist formalized networks for rumour dissemination. One established outlet is The Wall Street Journal (WSJ) through its Heard on the Street and Abreast of the Market columns (Pound and Zeckhauser, 1990; Zivney et al., 1996). Recently, the advent of the Internet has provided a new outlet in the form of Internet Discussion Sites (IDS). Postings in IDS can take a variety of forms, for example, requests for information, investment recommendations, or expressions of opinion. Therefore, not all postings in IDS can be classified as rumour. Only those containing unverified information and espousing a sentiment fit the definition of a rumour.

Recent studies have started to describe and investigate the accuracy of rumours posted in IDS, and the market's reaction to postings. The results indicate that rumoured earnings figures are a valuable source of information regarding future earnings (Bagnoli et al., 1999), and that there is increased market activity associated with investor sentiment in IDS and with the volume of posts (Wysocki, 2000; Das and Chen 2001; Tumarkin and Whitelaw, 2001; Antweiler and Frank, 2004), although there is still debate about whether increased market activity leads sentiment or sentiment leads activity. These findings are consistent with recent analytical work by Van Bommel (2003), which predicts that followers of rumours, especially early followers, can profit from trading on them.

In the present study, we investigate the market reaction to takeover rumours posted in IDS. For purposes of the present study, a takeover rumour is a post containing an unofficial proposition that a listed company will be, should be or could be taken over. Our sample data consist of 189 takeover rumours posted on the Hotcopper IDS between May 1999 and March 2000. Similar to Yahoo and Raging Bull, Hotcopper (www.hotcopper.com.au) is a public bulletin board and was featured as one of the 10 most visited Australian 'Business and Finance' websites in 2001.\(^2\) We find evidence of abnormal return and trading volume activity on the day the rumour is posted and the day before. More directly, our intraday analysis documents significant returns and trading volume during the 10 min posting interval and abnormal trading volume during the 10 min interval immediately preceding it. We also find that the results are largely driven by the subsample of companies that had not been identified as likely takeover targets in the press during the year preceding the posting. Taken together, we interpret this evidence, most notably that from the intraday analysis, as supportive of the hypothesis that the market reacts to the posting of takeover rumours on IDS.

within the context of financial markets, describes it as 'unofficial public information with an unknown quantity of truth and untruth' and argues that financial markets are 'the perfect breeding ground for rumours because highly competitive industry participants value every piece of information in vying for a comparative advantage'.

\(^2\) Source: www.hitwise.com.au. Public bulletin boards are structured forums in which users post messages that remain online for other participants to view for a period of up to a few weeks. Users can post a message by filling in a template that includes a 'subject' box and a 'text' box. Viewers can reply to existing posts, ask other members for feedback and guidance on investment issues or initiate discussion of a new topic. Posts can be lodged and viewed by anybody without paying a subscription fee.

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We view our experimental design as better suited for directly examining the market reaction to postings in IDS than predecessor studies for the following reasons. First, shareholders in target firms typically earn large positive returns as soon as a proposed takeover is announced (Jensen and Ruback, 1983; Malatesta, 1983). By focusing exclusively on takeover rumours, we restrict the study to an examination of rumours about a specific event that is well known to be of interest to investors and to which the reaction should be uniformly positive. In contrast, Antweiler and Frank (2004) and Das and Chen (2001) consider all IDS posts relating to their respective sample companies and then using computational linguistics applications, ‘judgementally’ assess the sentiment in the postings.

Second, by examining intraday return and trading volume data, we are better able to isolate the effects of the rumour posting, if any. Although an analysis of daily return and trading volume data surrounding the rumour posting day has the potential to provide insights into the market reaction to the posting, competing explanations also exist. For example, the market reaction might simply be to information released through other media that could not reasonably be screened during the sample construction process. Alternatively, if posters are merely reacting to increases in share price and/or trading volume (Tumarkin and Whitelaw, 2001), the observed market activity, although correlated with the IDS rumour, would not be in response to its posting.3 It is far less likely that reactions observed in the 10 min posting interval would be vulnerable to these or other competing explanations.

Our findings have implications for several important constituents. Clearly, by identifying IDS as a source of information, they are of immediate and direct interest to investors. In addition, postings in IDS have recently become an item of interest to regulators, with a considerable and growing body of anecdotal evidence of attempts to manipulate the market through IDS postings leading regulators to increase regulation and surveillance of the sites. In addition, litigation by the Australian Securities and Investment Commission (ASIC) and the US Securities and Exchange Commission (SEC) of posters deemed to have inappropriately used IDS, including ‘pump and dump’ strategies, indicates a belief by regulatory bodies that rumour posted on these sites affects firm value.4 Our findings provide

3 There is potentially an endogeneity issue in that our evidence does not unambiguously distinguish between whether rumour induces volume and price movements or whether volume and price movements generate rumour. It is likely that both feed off each other (i.e. the more price and volume movement, the greater the likelihood of rumour being generated to explain the movement; conversely, the stronger and more prevalent the rumours, the greater the likelihood of movement in price and volume as followers of IDS trade on the rumours). We believe that by undertaking intraday analysis in ten-minute intervals, we get closer to our question of whether rumour induces a market reaction.

4 ASIC has prosecuted a number of parties for supplying misleading information on IDS in the last few years. In the USA in 1997, Presstock, a small company, sued individuals who were attempting to manipulate the company’s stock price through the Internet. As noted by Antweiler and Frank (2004), the SEC has also taken legal action against various persons attempting to manipulate share prices using the Internet.
formal support for the regulators' view of IDS as a source of information for the market.

There are also several reasons why management should be concerned about the rumours posted in IDS. First, the Australian Stock Exchange (ASX) has recently recognized the potential for rumour to move stock prices and has, in its concern about the creation of false markets, extended its continuous disclosure regulation to require management to substantiate any credible rumours published in the media through a public announcement made to the ASX. Furthermore, if as suggested by the ASX and SEC, these rumours have the ability to move price and create false markets, then corporate executives have an incentive to manage disclosure to mitigate their effect. Specifically, if rumour moves price, it has the potential to increase share price volatility and, thereby, cost of capital. In fact, Antweiler and Frank (2004) and Wysocki (2000) document such an increase in volatility following postings. Finally, in modelling how rumour affects the market, Kosfeld (1998) suggests that the more often a rumour is communicated and the greater the number of sources through which it is communicated, the greater the credibility attached to it. Therefore, Kosfeld's view would suggest that irrespective of whether price leads sentiment or sentiment leads price, the existence of a rumour on IDS re-enforced by movements in price and volume would add to the credibility of both the rumour and the related market reaction. Allowing a rumour to perpetuate can then lead to further changes in price and additional increases in volatility.

The remainder of the present paper is organized as follows. Section 2 provides an overview of the recent published literature on IDS and rumours more generally, and concludes with the development of our hypothesis. A description of the sample data is provided in Section 3. Section 4 presents the results and Section 5 contains a summary and conclusions.

2. Rumour, market sentiment and IDS

2.1. IDS studies

Online trading has replaced traditional brokering for many investors and introduced new investors to the market as a result of lower costs and increased convenience (Barber and Odean, 1999; Ahmed et al., 2003). Historically, the exchange of information between corporate management and securities analysts and the release of information on a selective basis to clients has enhanced the value of the information provided by traditional brokers. However, investors now have timely access to a wide range of information and opinion about stocks at relatively low cost through the Internet. For example, online financial bulletin boards and chat rooms, such as Hotcupper, Motley Fool, Yahoo and Raging Bull, provide interactive sites where participants trade information, opinion and rumour about listed securities.

Recent studies have started to describe and investigate the accuracy of rumours posted in IDS and the market's reaction to postings. Bagnoli et al. (1999) assess the
accuracy of rumoured earnings figures found in IDS, the WSJ, Dow Jones newswires and press releases. Labelling these unofficial forecasts as ‘whisper’ forecasts, they find them to be more accurate predictors of actual earnings than consensus analyst forecasts. This result has attracted widespread publicity because it suggests that, despite their unverified content and largely unidentifiable source, rumoured earnings are useful predictors of future earnings.

Antweiler and Frank (2004) consider posts in both the Yahoo and Raging Bull IDS, finding that a positive shock to message board postings predicts negative but economically small returns on the next day. They also find, using computational linguistics applications to gauge the sentiment of their sample posts, that both posting activity and the extent of disagreement among the messages help predict subsequent trading volume. Finally, their results indicate that posting activity helps predict volatility. The authors reject the notion that message board ‘talk’ is just noise and conclude that the talk ‘appears to be very pertinent for predicting trading volume and volatility’. Das and Chen (2001) also use a natural language algorithm to classify IDS posts, finding that the messages reflect information rapidly but do not forecast returns.

Alternatively, Tumarkin and Whitelaw (2001) and Wysocki (2000) focus on posting activity. Wysocki finds that on the day before, the day of, and the day following an earnings announcement, posting volumes are greater than the historic average posting volume. In addition, he finds that posters are most active when share turnover for the day is high and when the share price has suffered. He also finds that a 10 per cent increase in overnight postings results in a 1.5 per cent increase in trading volume the following trading day and that a doubling in overnight postings is associated with a 0.18 per cent positive abnormal return the following day. He concludes that ‘changes in overnight posting activity contain value-relevant information’.

Tumarkin and Whitelaw (2001) analyse the association between Internet message board activity in the Raging Bull IDS and abnormal stock returns and trading volume for stocks in the Internet service sector. They find that for days with high abnormal message activity, changes in investor opinion correlate with abnormal industry-adjusted returns, and that these event days also coincide with abnormally high trading volume. They also find that message board activity does not predict industry-adjusted returns or abnormal trading volume, but rather, that market information influences message board activity.

2.2. Issues of credibility

Notwithstanding these findings, the question of why posts in IDS would be viewed as informative remains. Given the difficulty (impossibility) of verifying either the authenticity of the content of the post or the identity of the poster because posters tend to use nicknames, the motives for posting remain unclear. However, insights into how or why posts in IDS might influence market behaviour follow from both informal attempts to understand the nature of IDS posters (Campbell, 2001; Pollner, 2002) and formal models (Van Bommel, 2003).
One line of research, pursued by Poliner (2002) and Campbell (2001), among others, has sought to gain insights into the nature of IDS posters by examining the posts directly. Based on their analysis, Poliner and Campbell both conclude that a sense of community appears to be fostered on the sites, with participants actively seeking to establish a reputation for providing credible and valuable insights to other members of the community. Their arguments suggest that although the incentives to post might be varied, the underlying motivation is almost always to influence stock price because, among other things, movement in the share price in the predicted direction validates the information provided by the poster and, thereby, enhances their reputation within the community.

Alternatively, Van Bommel (2003) constructs a model using a Kyle (1985) auction process that identifies economic incentives for investors with private information to spread rumours and for receivers of rumour to trade on them. He restricts the Kyle process by assuming the investor with private information has limited wealth and is, therefore, unable to fully benefit from trading until the information becomes fully public. He proposes that the investor will instead initially trade on the information and then release some aspect of it in the form of a rumour to followers who then trade on the rumour. As the share price moves in the direction of the rumour, the investor again profits by taking an opposite position when the price overshoots its true value.

Van Bommel considers his model in the context of three information scenarios. In the first scenario the rumour contains accurate information; in the second, the investor has no information so they bluff; and in the third, the investor spreads false rumours. He shows that it is only in the case of honest rumour that the investor can continue to profit. An important factor of these models is the credibility of the person spreading the rumour. In a repeated game, bluffing and cheating erode the reputation of the person who spreads the rumour and eliminate any profits. Van Bommel then concludes that on the whole, rumours are informative (if they were only ever false they would not survive) and followers of rumours can profit by trading quickly on the information. In this sense, Van Bommel’s model provides a potential explanation for the behaviour observed in IDS. Financial bulletin boards and chat rooms provide an avenue for investors to disseminate rumours to followers. It also explains why followers of a site like Hotcopper could rationally expect that posted messages might contain credible information. Based on the arguments of Van Bommel, if messages consistently contained false rumour there would be no followers willing to trade on the information and sites like Hotcopper would cease to exist. Furthermore, our study was conducted in mid-1999 to mid-2000. During this time the takeover market was quite active. This activity increases the probability that a rumoured takeover might actually occur and would likely enhance the perceived credibility of rumours of takeovers.

Kyle (1985) models an auction process whereby insiders profit by trading on inside information through incremental trades over time. His model relies on the existence of noise traders to initially camouflage the trades of the insider. In his model, the sole source of information to the market is the volume of trading.
2.3. Takeover rumour studies

Prior research indicates that takeover rumours published in formal outlets are associated with an increase in share price. Pound and Zeckhauser (1990) assess abnormal returns surrounding takeover rumours published in the *Heard on the Street* column of the *WSJ* from 1983 to 1985. Although they find abnormal returns to the rumoured target's shares to be insignificant on the day of publication, they do find a positive buy-and-hold abnormal return of 7 percent for the month before the publication of a rumour. They conclude that their findings are consistent with the notion that market activity might stimulate the *WSJ* rumour, a conclusion consistent with the published IDS rumour literature that suggests that rumour posting in IDS might be generated in reaction to market activity (Das and Chen, 2001; Antweiler and Frank, 2004). Finally, they conclude that the market reacts efficiently to takeover rumours, finding that there are no risk-adjusted abnormal returns to a strategy of purchasing the rumoured target’s shares at the end of the day on which the rumour appears and selling them either after 1 year or at the close of the day a formal takeover bid is made.

Zivney et al. (1996) argue that Pound and Zeckhauser’s (1990) use of takeover rumours in the *Heard on the Street* column might be contaminated because most rumours appear weeks earlier in the *Abreast of the Market* column. They then analyse only takeover rumours appearing in both columns between 1985 and 1988, finding a buy and hold abnormal return of 7.5 per cent over the 20 day period preceding the day of first publication and a 3.44 per cent positive abnormal return on the day of publication and conclude, based on the latter finding, that the *WSJ* rumours caused the market reaction. Furthermore, the abnormal returns they find over short holding periods (e.g. 100 days post rumour) lead them to conclude that the market overreacts to takeover rumours published in the *WSJ*.

2.4. Summary and hypotheses

Fama et al. (1969) suggest that for information to have a market effect it need not be exact, it just needs to be better than no information. In the same vein, Ball (1980) argues that 'rumour, for example, can be better than no rumour, even if it is wild' and that the effect of rumour on the market is not affected by the likelihood that the rumour is false, but rather 'it relies upon the non-zero probability, however small, that it will be correct'. Kosfeld (1998) argues that an important characteristic of a rumour is not whether it is true or false, but rather the inability to tell and also that a rumour becomes more credible the more it is communicated and the greater the number of sources of the rumour.

We focus on takeover rumours posted in the IDS Hotcopper. Takeovers are of interest because shareholders in the target firm typically earn large positive returns as soon as official information relating to the takeover is announced (Jensen and
Ruback, 1983; Malatesta, 1983). Advance notice that a stock is to become a takeover target will allow an investor to share in the takeover premium. However, predicting takeovers in the absence of inside information is a difficult task about which much uncertainty exists (Palepu, 1986).

Although a casual reading of posts in IDS might easily lead one to believe that they are just noise, the empirical and analytical published literature reviewed above suggests that the posts might in fact be viewed as informative. Furthermore, information need not be perfect to be the basis of investment decisions. Therefore, we argue that the market should react to takeover rumours posted in IDS to the extent that they are perceived as potentially containing information relating to an imminent takeover. Furthermore, because access to IDS rumour is essentially costless, capital markets should adjust for any information content in the rumour rapidly.

Formally, the hypothesis tested in the present study, stated in the alternative, is:

\( H_1: \) There is a positive market reaction to the posting of takeover rumours in Internet Discussion Sites (IDS).

3. Sample data

Our preliminary sample consists of all takeover rumours posted in Hotcopper between 1 May 1999 and 31 March 2000. For our purposes, a takeover rumour is defined as a post containing an unofficial proposition that a listed Australian company will, should, or could be taken over. Messages posted over the sample period were archived by Hotcopper and management made these available to us for the present study. The post archives contain 141,023 messages. From these, posts containing the words ‘takeover’ or ‘acquire’ in their text were identified by an electronic search. This procedure identified 3,338 posts that were then read to identify the context in which these keywords were used. Posts were excluded if they were not used in relation to the likely future takeover of a company (e.g. if they referred to acquisitions of assets or to historical takeover activity) or if the post occurred subsequent to a formal announcement of a takeover bid. These procedures left a sample of 476 takeover rumours.

The final sample consists of the 189 takeover rumours that met the following criteria:

1. The post was not merely a request for information about a takeover.
2. There were no conflicting or contradictory rumours posted on the same day.\(^7\)
3. The rumoured target was not the subject of either a press report or company announcement on the day that the rumour is posted.\(^8\)

\(^6\) The word ‘target’ was not used in the search as this term is used in the syntax of every post.
\(^7\) This ensures the rumour sentiment on the day is uniformly positive throughout the sample.
\(^8\) Titles and lead paragraphs of all Australian and New Zealand publications were searched using the Dow Jones Interactive website for the target name on the day the rumour is posted.
Table 1
Descriptive statistics for a sample of 118 Australian companies rumoured to be takeover targets on the Hotcopper Internet Discussion Site (IDS) between May 1999 and March 2000\(^a\)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of rumours</td>
<td>1.64</td>
<td>1</td>
<td>1.97</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Readership</td>
<td>184</td>
<td>127</td>
<td>163</td>
<td>13</td>
<td>686</td>
</tr>
<tr>
<td>Market capitalization ($A million)</td>
<td>316</td>
<td>39</td>
<td>1031</td>
<td>1.69</td>
<td>9998</td>
</tr>
</tbody>
</table>

Panel B: Distribution of posts by time of posting

<table>
<thead>
<tr>
<th>Before open</th>
<th>Posts</th>
<th>Trading hours</th>
<th>Posts</th>
<th>After close</th>
<th>Posts</th>
<th>Weekends and holidays</th>
<th>Posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01-1.00</td>
<td>9</td>
<td>10.01-11.00</td>
<td>3</td>
<td>16.01-17.00</td>
<td>7</td>
<td>Saturday</td>
<td>12</td>
</tr>
<tr>
<td>1.01-2.00</td>
<td>2</td>
<td>11.01-12.00</td>
<td>13</td>
<td>17.01-18.00</td>
<td>8</td>
<td>Sunday</td>
<td>16</td>
</tr>
<tr>
<td>2.01-3.00</td>
<td>3</td>
<td>12.01-13.00</td>
<td>13</td>
<td>18.01-19.00</td>
<td>10</td>
<td>Holidays</td>
<td>2</td>
</tr>
<tr>
<td>3.01-4.00</td>
<td>2</td>
<td>13.01-14.00</td>
<td>10</td>
<td>19.01-20.00</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.01-5.00</td>
<td>1</td>
<td>14.01-15.00</td>
<td>10</td>
<td>20.01-21.00</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.01-6.00</td>
<td>0</td>
<td>15.01-16.00</td>
<td>9</td>
<td>21.01-22.00</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.01-7.00</td>
<td>3</td>
<td></td>
<td>22.01-23.00</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.01-8.00</td>
<td>7</td>
<td></td>
<td>23.01-24.00</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.01-9.00</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.01-10.00</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>58</td>
<td>60</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel C: Distribution by sample companies by Australian Stock Exchange (ASX) industry code

<table>
<thead>
<tr>
<th>ASX industry code</th>
<th>Rumoured targets</th>
<th>ASX industry code</th>
<th>Rumoured targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gold</td>
<td>41</td>
<td>14. Transport</td>
<td>4</td>
</tr>
<tr>
<td>2. Other metals</td>
<td>24</td>
<td>15. Media</td>
<td>22</td>
</tr>
<tr>
<td>3. Diversified resources</td>
<td>2</td>
<td>16. Banks and finance</td>
<td>3</td>
</tr>
<tr>
<td>4. Energy</td>
<td>7</td>
<td>17. Insurance</td>
<td>6</td>
</tr>
<tr>
<td>5. Infrastructure and utilities</td>
<td>3</td>
<td>18. telecommunications</td>
<td>28</td>
</tr>
<tr>
<td>6. Developers and contractors</td>
<td>6</td>
<td>19. Investments and financial services</td>
<td>3</td>
</tr>
<tr>
<td>9. Food and household</td>
<td>2</td>
<td>22. Miscellaneous industrials</td>
<td>19</td>
</tr>
<tr>
<td>11. Engineering</td>
<td>1</td>
<td>23. Diversified industrials</td>
<td>1</td>
</tr>
<tr>
<td>13. Retail</td>
<td>4</td>
<td>24. Tourism and leisure</td>
<td>6</td>
</tr>
</tbody>
</table>

\(^a\)The data are for 189 rumours relating to 118 companies.

4. The company was listed on the ASX and return data were available from the Securities Industry Research Centre of Asia-Pacific (SIRCA) Daily Database for the Australian All Ordinaries Accumulated Index and for both the intraday and interday trading periods examined in the study (see Section 4).

Table 1 presents descriptive statistics on both rumour activity and company characteristics. Panel A shows that the sample companies were the subject of an average

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of 1.64 rumours and a median of 1 rumour. It also shows that, on average, the posts were viewed 184 times; however, readership varied from 13 to 686 times. It appears that factors influencing the number of times a post is read include the time of day that it is posted and the strength of the claim in the post’s subject box. Finally, Panel A shows that the rumoured targets are typically small companies, with a median market capitalization, measured at the end of the financial period immediately preceding the rumour, of $A39 million and 40 per cent of the rumoured targets having a market capitalization of under $A20 million.\(^9\) There is, however, considerable variation, with market capitalization ranging from $A1.7 million to $A9.6 billion.

Panel B in Table 1 presents a frequency distribution for the time of day that the sample rumours were posted. As can be seen, the incidence of posting is greatest during trading hours and after the close of trading. Panel C shows that the greatest numbers of rumoured targets are in the gold, other metals, media, telecommunications and miscellaneous industrials industry classifications.

Finally, the actual incidence of takeover activity involving the sample companies appears greater than random chance would suggest. An examination of the Sirica Signal G Announcements database shows that 11.02 per cent of the sample became the target of takeover activity during the 12 months subsequent to the posting.\(^10\) In contrast, only 3.37 per cent of companies listed on the ASX during the sample period were the subject of takeover activity during the subsequent 12 months. The \(t\)-statistic on the difference in proportions is 3.305 \((p < 0.001)\). Therefore, the takeover rumours in our sample appear to have some degree of reliability.\(^11,12\)

4. Empirical results

4.1. Preliminary analysis

As a preliminary step, we examine daily market-adjusted returns and abnormal trading volume over the period from day \(t = -5\) to \(t = +5\) relative to the day the

\(^9\) These findings are consistent with Tumarkin and Whitelaw (2001), Bagnoli et al. (1999) and Wysocki (2000) who all report that small companies are most frequently discussed in IDS.

\(^10\) The Sirica Signal G database identifies all official takeover announcements relating to ASX companies.

\(^11\) Because the industry distribution of our sample companies is skewed towards resource companies relative to the industry composition of the ASX, we also calculated a weighted average takeover activity measure for the ASX with weights based on the sample company industry composition. Herein, the percentage of takeover activity is 3.61 per cent, again significantly lower than the incidence of takeover activity for our sample firms \((p < 0.001)\).

\(^12\) Although the figure of 11.02 per cent is lower than the figures reported by Pound and Zeckhauser (1990) (42.86 per cent) and Zivney et al. (1996) (29.14 per cent), the IDS forum is a much less formal medium than the Heard on the Street and Abreast of the Market columns in The Wall Street Journal that they examine.
rumour is posted ($t = 0$). In this and subsequent analysis, we consider both return and trading volume data following Antweiler and Frank (2004), among others, who argue that share price shifts reflect changes in the marginal investor’s perception of stock value whereas increased trading activity reflects a lack of consensus regarding price. Therefore, both metrics can provide evidence consistent with IDS being a forum for the dissemination of information.\textsuperscript{13}

The results (not tabulated) indicate that the rumoured targets experience significant positive abnormal returns on days $t = -2$ to $t = 0$ and significant abnormal trading volumes on days $t = -1$ and $t = 0$. The abnormal returns ($p$-values) for days $t = -2$ to $t = 0$ are 1.09 percent ($p = 0.020$), 2.95 percent ($p < 0.001$) and 2.37 percent ($p < 0.001$), respectively, and the abnormal trading volumes ($p$-values) for days $t = -1$ and $t = 0$ are 1.306 ($p = 0.049$) and 1.578 ($p = 0.005$), respectively.\textsuperscript{14}

All remaining abnormal returns and trading volumes are insignificant at conventional levels.\textsuperscript{15} Therefore, the results indicate that there is abnormal market activity immediately preceding the rumour posting day and on the day of the posting. Because by sample construction, none of the sample firms are the subject of contemporaneous information recorded on the Dow Jones Interactive website on day 0, the significant activity around the rumour date is consistent with the market reacting positively to the posting of takeover rumours in IDS.

4.2. \textit{Intraday return and trading volume data}

Although the interday analysis has the potential to provide preliminary insights into the market reaction to IDS postings, competing explanations also exist. For example, the documented reaction might alternatively be to information released in a medium that cannot be reasonably screened during the sample construction process (e.g. analyst recommendations to clients and television programmes). Furthermore, posters might simply be reacting to increases in share price and trading volume (Tumarkin and Whitelaw, 2001) and/or posters might simply be attempting to hype a stock through IDS postings consistent with recent anecdotal evidence of market manipulation schemes such as 'pump and dump'.

Therefore, we base our primary analysis on intraday return and trading volume data. Herein, we focus on the 13 10 min intraday trading intervals surrounding the posting of the rumour. By focusing on these relatively narrow intervals, we

\textsuperscript{13} Abnormal trading volume is calculated as the ratio of the actual daily trading volume to the average daily trading volume over the period $t = -60$ to $t = -10$ relative to the day the rumour is posted. Note that return results based upon both industry-adjusted and risk-adjusted returns using the capital asset pricing model are qualitatively identical to those discussed.

\textsuperscript{14} For the abnormal trading volume analysis, the reported $p$-values are for the test of the null hypothesis that abnormal trading volume is equal to 1 and are one-tailed tests.

\textsuperscript{15} Results for the non-parametric Wilcoxon test statistic are qualitatively identical.
argue that our return and volume data are less likely to be contaminated by confounding influences, thereby allowing us to best isolate the capital market implications of an IDS takeover rumour posting. The specific intervals we consider are the 10 min interval during which the rumour was posted, the six 10 min intervals comprising the hour before the posting interval and the six 10 min intervals comprising the hour after the posting interval. As noted, the Hotcopper archives identify the exact time that each message is posted. For this analysis, if a rumour is posted when the market is closed, the posting interval is deemed to be the first 10 min of trade on the subsequent trading day. In a similar fashion, if the posting occurs during the first or last hour of the day, trading data are drawn from the preceding or following day as appropriate. If a stock does not trade during a given interval, its return is deemed to be zero.

Mean raw returns and trading volume measures for these intraday trading intervals are presented in the first and fourth columns of Table 2, respectively. We focus on raw returns following Fama (1998) and Busse and Green (2002) who compare intraday raw and abnormal returns, finding that the choice does not materially affect their results. The measure of (relative) trading volume we use is the number of shares traded in the 10 min interval expressed as a proportion of the total number of shares traded during the day. To test for its significance, we compare it against the benchmark that trading volume occurs uniformly over the 36 10 min intervals of the trading day (i.e. against $1/36 = 0.028$).  

As showed, the largest and most significant mean return is for the 10 min posting interval (0.439 per cent, $p < 0.001$).  

The only other statistically significant mean returns are for the intervals ‘60–50 min prior’ (–0.193 per cent, $p = 0.037$) and ‘40–50 min after’ (–0.214 per cent, $p = 0.032$). All remaining mean returns are insignificant, most notably those for the intervals immediately adjacent to the posting interval. However, after accounting for transactions costs, the only return both statistically and economically significant is that of the posting interval. Alternatively,

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16 Although there is considerable evidence that trading does not occur uniformly throughout the day, we nevertheless believe that an assumption of a uniform distribution is reasonable for our setting because there is relatively little clustering of the sample IDS postings throughout (and after) the trading day. Results are qualitatively unaffected when we compare the mean volume measures against those for the same intervals during the week before the postings.

17 Because many of the 189 rumoured targets do not trade in each intraday interval, we supplement the traditional test statistics with a bootstrapping technique. The bootstrap population consists of the average parameter of 1000 bootstrap samples, with each bootstrap sample comprising all 189 observations for the interval held in random weights. The percentile confidence intervals surrounding the bootstrapped average raw returns are consistent with the traditional test statistics.

18 A review of transactions costs for online brokers shows that transactions costs range from approximately 0.15 to 0.20 per cent. For example, the fee for a trade to a maximum value of $A10,000 is $A16.95 for CommSec.

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| Time relative to the | Mean returns^b | Mean relative trading volume^d |  |
|---------------------|----------------|-------------------------------|  |
| rumour posting interval | Posting day (%) | Prior week (%) | p-value^c | Posting day | Prior week | p-value^c |
| 60–50 min prior | −0.193 (0.037) | −0.053 (0.559) | 0.280 | 0.029 (0.885) | 0.024 (0.319) | 0.515 |
| 50–40 min prior | 0.094 (0.317) | 0.047 (0.519) | 0.692 | 0.023 (0.038) | 0.027 (0.823) | 0.451 |
| 40–30 min prior | 0.006 (0.956) | 0.209 (0.028) | 0.088 | 0.026 (0.666) | 0.033 (0.460) | 0.393 |
| 30–20 min prior | −0.018 (0.875) | −0.054 (0.432) | 0.792 | 0.028 (0.976) | 0.041 (0.116) | 0.142 |
| 20–10 min prior | 0.095 (0.388) | 0.038 (0.023) | 0.670 | 0.039 (0.064) | 0.034 (0.131) | 0.506 |
| 10–0 min prior | 0.132 (0.380) | 0.052 (0.561) | 0.648 | 0.054 (<0.001) | 0.085 (<0.001) | 0.006 |
| 10 min posting interval | 0.439 (<0.001) | 0.097 (0.426) | 0.036 | 0.082 (<0.001) | 0.035 (0.153) | <0.001 |
| 0–10 min after | −0.188 (0.120) | −0.044 (0.663) | 0.360 | 0.037 (0.017) | 0.028 (0.976) | 0.116 |
| 10–20 min after | 0.010 (0.920) | 0.022 (0.746) | 0.915 | 0.036 (0.079) | 0.027 (0.871) | 0.124 |
| 20–30 min after | −0.203 (0.096) | 0.090 (0.341) | 0.057 | 0.036 (0.041) | 0.025 (0.555) | 0.071 |
| 30–40 min after | −0.036 (0.723) | −0.104 (0.145) | 0.591 | 0.034 (0.342) | 0.032 (0.459) | 0.875 |
| 40–50 min after | −0.214 (0.032) | −0.064 (0.363) | 0.220 | 0.028 (0.873) | 0.031 (0.616) | 0.700 |
| 50–60 min after | −0.028 (0.690) | 0.046 (0.485) | 0.442 | 0.024 (0.230) | 0.025 (0.453) | 0.930 |
| F-test^e | 2.894 (<0.001) | 0.999 (0.447) | 10.141 (<0.001) | 7.864 (<0.001) |  |

^aThe 13 10 min intraday periods are defined relative to the 10 min interval within which the rumour is posted. ^b p-value for significant of the mean intra-interval return reported in parentheses. ^c p-value for the test of equality of mean returns between the posting week and the prior week. ^d Daily abnormal trading volumes are calculated as the ratio of the actual daily trading volume to expected trading volume where expected trading volume is the average trading volume over the period t = −60 to t = −10; p-values for the significance of the mean abnormal trading volumes for the overall sample are reported in parentheses. ^e F-test for equality of means across the 13 10 min trading periods; p-values in parentheses.
the largest and most significant mean volume measures are for the 10 min posting interval and the interval immediately preceding it (0.082, p < 0.001 and 0.054, p < 0.001, respectively). The only other statistically significant mean volumes occur during the intervals from ‘50–40 min prior’ (0.023, p = 0.038), ‘0–10 min after’ (0.037, p = 0.017) and ‘20–30 min after’ (0.036, p = 0.041).

As additional support, the reported F-statistic of 2.894 (p = 0.001) presented at the bottom of the returns column indicates that the null hypothesis of equal mean returns across the intervals can be rejected. Similarly, the reported F-statistic of 10.141 (p < 0.001) at the bottom of the volume column indicates that equality of mean volume measures across the intervals can also be rejected. Furthermore, Tukey’s HSD pairwise comparisons (not reported) indicate that mean return and volume measures for the 10 min rumour posting interval are significantly different from those measures for the immediately adjacent intervals.

Finally, to gain insights into the intraday return behaviour of our sample companies and to provide a benchmark, we also collected return and volume data for the same 13 10 min intervals during the week immediately before the posting of the rumour. These measures, which are for the same time of day and day of the week, are reported in the second and fifth columns of Table 2. As can be seen, the only significant return is for the interval that aligns with ‘40–30 min prior’ (0.209 per cent, p = 0.028) and the only significant volume is for the interval that aligns with ‘10–0 min prior’ (0.085, p < 0.001). In conjunction with this, the third and sixth columns present p-values for the test of equality of means between the posting week and aligned intervals. The only significant difference in returns is for the posting interval (p = 0.036) and the only significant differences in volumes are for the posting period (p < 0.001) and the period ‘10–0 min prior’ (p = 0.006). However, the volume is in fact higher for this latter interval during the week preceding than for the posting week.

Taken together, we interpret the intraday results as providing consistent evidence of a strong and significant market reaction to the posting of takeover rumours in IDS. Specifically, the results indicate a price increase and increased trading volume concurrent with the posting of takeover rumours in IDS. The largest and most significant return occurs during the 10 min posting interval. It is also the only return that is economically significant after adjusting for transactions costs. Furthermore, the largest and most significant trading volumes occur during the 10 min posting interval and the interval immediately preceding it (‘10–0 min prior’). Finally, when compared to returns and volumes for other intervals and from the previous week, the return and trading volume measures during the posting interval are also noteworthy.19

19 Results for tests of trading volume standardized by shares outstanding are qualitatively identical.
4.3. Further refinements

4.3.1. Potential confounds

The results for analyses undertaken to address concerns regarding the influence of potential confounds or contaminants are presented in Table 3. The intraday return data are presented in Panel A and the intraday trading volume data in Panel B. In both instances, results for the full sample as reported in Table 2 are reproduced in the first row to provide the context. Only results for the five intraday trading intervals from '20–10 min prior' to '10–20 min after' are tabulated given both the relevance and documented significance of these intervals.

The potential confounds or threats that we confront relate to overnight posts, multiple rumours, prior media stories and rumour credibility. In brief, we find our results and conclusions to be robust to these potential threats, and in some instances strengthened. First, we consider whether the results are affected by events that occur overnight or on weekends by repeating the analysis based only on the sample of 46 companies for which the posting occurred between 11.00 and 14.59 hours on a trading day (i.e. those with a minimum of 1h of trading both before and after the posting interval). Here, the only significant mean return and volume are for the 10 min posting interval. Note, this finding for volume is in contrast with the primary analysis where there was also increased trading volume in the intervals immediately adjacent to the posting interval.

Second, because the overall sample of 189 rumours relates to only 118 unique target companies, we repeat the analysis based upon only the first posted rumour for each company during the sample period. Results for this subsample are generally consistent with those for the overall sample, although the average posting interval return and volume measures are slightly larger and more significant.

Third, we partition the sample on the basis of whether the target company had been identified in the press as a likely takeover target during the year preceding the rumour posting. Herein, a search of Australian newspapers for each of the sample companies using the LexisNexis database showed that 46 target companies had been the subject of a takeover story in the press. Results based on this partition indicate that the posting interval mean return is only significant for the subsample of 143 companies with no prior media stories. In contrast, the mean volume measures are significant for the posting interval and the interval ‘10–0 min prior’ for both subsamples. Furthermore, the F-values (not reported) for the tests of equality of mean returns and volumes across the intervals are both significant for the subsample of companies with no prior media stories but not for the subsample of companies with stories in the media. Therefore, the intraday results appear to have been largely driven by the subsample of companies for which there was no prior media reference as a takeover target.20

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20 The same conclusion pertains for the interday analysis discussed in Section 4.1.
Table 3
Additional intraday analyses addressing concerns regarding potential confounds

<table>
<thead>
<tr>
<th>Analysis</th>
<th>20–10 min</th>
<th>10–0 min</th>
<th>10 min posting interval</th>
<th>0–10 min</th>
<th>10–20 min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>prior</td>
<td>prior</td>
<td>after</td>
<td>after</td>
<td>after</td>
</tr>
<tr>
<td>Panel A: Mean returns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.095% (0.388)</td>
<td>0.132% (0.380)</td>
<td>0.439% (&lt;0.001)</td>
<td>-0.188% (0.120)</td>
<td>0.010% (0.920)</td>
</tr>
<tr>
<td>Excluding overnight posts</td>
<td>0.076% (0.513)</td>
<td>0.101% (0.240)</td>
<td>0.393% (0.044)</td>
<td>-0.151% (0.203)</td>
<td>-0.004% (0.883)</td>
</tr>
<tr>
<td>First rumour (n = 118)</td>
<td>0.107% (0.286)</td>
<td>0.149% (0.301)</td>
<td>0.488% (&lt;0.001)</td>
<td>-0.144% (0.156)</td>
<td>0.013% (0.744)</td>
</tr>
<tr>
<td>Prior media story (n = 46)</td>
<td>-0.123% (0.240)</td>
<td>-0.100% (0.590)</td>
<td>0.135% (0.305)</td>
<td>-0.167% (0.801)</td>
<td>0.043% (0.801)</td>
</tr>
<tr>
<td>No prior media story (n = 143)</td>
<td>0.158% (0.243)</td>
<td>0.207% (0.276)</td>
<td>0.536% (&lt;0.001)</td>
<td>-0.195% (0.185)</td>
<td>-0.001% (0.993)</td>
</tr>
<tr>
<td>Resource sector (n = 65)</td>
<td>0.064% (0.333)</td>
<td>0.152% (0.280)</td>
<td>0.597% (&lt;0.001)</td>
<td>-0.109% (0.309)</td>
<td>0.049% (0.700)</td>
</tr>
<tr>
<td>Unregulated firms (n = 139)</td>
<td>0.126% (0.211)</td>
<td>0.157% (0.310)</td>
<td>0.503% (&lt;0.001)</td>
<td>-0.204% (0.064)</td>
<td>0.011% (0.933)</td>
</tr>
<tr>
<td>Takeover activity (n = 24)</td>
<td>0.139% (0.217)</td>
<td>0.204% (0.194)</td>
<td>0.681% (&lt;0.001)</td>
<td>-0.227% (0.087)</td>
<td>0.018% (0.943)</td>
</tr>
<tr>
<td>No takeover activity (n = 165)</td>
<td>0.089% (0.404)</td>
<td>0.122% (0.331)</td>
<td>0.404% (&lt;0.001)</td>
<td>-0.192% (0.117)</td>
<td>0.009% (0.955)</td>
</tr>
</tbody>
</table>

Panel B: Trading volume

<table>
<thead>
<tr>
<th>Analysis</th>
<th>20–10 min</th>
<th>10–0 min</th>
<th>10 min posting interval</th>
<th>0–10 min</th>
<th>10–20 min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>prior</td>
<td>prior</td>
<td>after</td>
<td>after</td>
<td>after</td>
</tr>
<tr>
<td>Full sample</td>
<td>0.039 (0.084)</td>
<td>0.054 (&lt;0.001)</td>
<td>0.082 (&lt;0.001)</td>
<td>0.037 (0.017)</td>
<td>0.026 (0.079)</td>
</tr>
<tr>
<td>Excluding overnight posts</td>
<td>0.039 (0.107)</td>
<td>0.039 (0.085)</td>
<td>0.075 (&lt;0.001)</td>
<td>0.032 (0.089)</td>
<td>0.034 (0.110)</td>
</tr>
<tr>
<td>First rumour (n = 118)</td>
<td>0.040 (0.090)</td>
<td>0.055 (&lt;0.001)</td>
<td>0.084 (&lt;0.001)</td>
<td>0.036 (0.039)</td>
<td>0.035 (0.088)</td>
</tr>
<tr>
<td>Prior media story (n = 46)</td>
<td>0.026 (0.066)</td>
<td>0.062 (0.041)</td>
<td>0.061 (0.001)</td>
<td>0.022 (0.405)</td>
<td>0.041 (0.378)</td>
</tr>
<tr>
<td>No prior media story (n = 143)</td>
<td>0.044 (0.060)</td>
<td>0.051 (0.001)</td>
<td>0.088 (&lt;0.001)</td>
<td>0.043 (0.002)</td>
<td>0.035 (0.090)</td>
</tr>
<tr>
<td>Resource sector (n = 65)</td>
<td>0.026 (0.336)</td>
<td>0.049 (0.002)</td>
<td>0.093 (&lt;0.001)</td>
<td>0.040 (0.012)</td>
<td>0.033 (0.165)</td>
</tr>
<tr>
<td>Unregulated firms (n = 139)</td>
<td>0.040 (0.067)</td>
<td>0.056 (&lt;0.001)</td>
<td>0.088 (&lt;0.001)</td>
<td>0.042 (0.006)</td>
<td>0.035 (0.079)</td>
</tr>
<tr>
<td>Takeover activity (n = 24)</td>
<td>0.034 (0.198)</td>
<td>0.040 (&lt;0.001)</td>
<td>0.091 (&lt;0.001)</td>
<td>0.036 (0.057)</td>
<td>0.032 (0.119)</td>
</tr>
<tr>
<td>No takeover activity (n = 165)</td>
<td>0.041 (0.036)</td>
<td>0.056 (&lt;0.001)</td>
<td>0.056 (&lt;0.001)</td>
<td>0.037 (0.028)</td>
<td>0.037 (0.063)</td>
</tr>
</tbody>
</table>

*The 10 min intraday periods are defined relative to the 10 min interval within which the rumour is posted; p-values reported in parentheses.
*The sample consists of the 46 companies for which the posting occurred between 11.00 and 14.59 hours.
*The analysis is based upon only the first posted rumour for each of the 118 target companies.
*The sample is partitioned on the basis of whether the target company had been identified in the press as a likely takeover target during the year preceding the rumour posting.
*The analysis is based upon only the 65 companies in the resources sectors (ASX industry codes 1 and 2, gold and other resources).
*The sample consists of the remaining 139 "unregulated" companies after companies in the media and telecommunications sectors (ASX industry codes 15 and 18) are deleted.
*The sample is partitioned on the basis of whether the rumoured target actually becomes the target of takeover activity within the 12 months subsequent to the post.

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The final threat we consider relates to the perceived credibility of the posted
rumours, with market reaction likely to accord with *ex ante* perceptions of rumour
credibility. Unfortunately, as discussed earlier, it is not possible to ascertain either
the identities or motives of the posters. Therefore, to (indirectly) consider the role of
rumour credibility, we attempt to identify rumours likely to be more or less credible
by considering industry membership and rumour accuracy. On balance, results based
on these admittedly crude and indirect attempts to measure credibility suggest that the
strength of the market reaction to the postings is related to their perceived credibility.

We begin by repeating the analysis based on two alternative industry restrictions,
arguing that takeover activity will be perceived as either more or less likely in certain
specific industries. First, we restrict the sample to the 65 companies in the resource
sectors (ASX industry codes 1 and 2, gold and other metals), arguing that takeover
rumours relating to companies in these sectors are likely to be afforded greater weight
given the trend towards consolidation and the extent of takeover activity in the sector
during the study period. We next delete the 50 firms in media and telecommunications
sectors (ASX industry codes 15 and 18), arguing that rumours relating to companies
in these industries would be viewed as less credible given regulatory restrictions
on ownership structure and the difficulty in acquiring approval. The results show
that the posting interval mean return and relative trading volume are higher for both
industry-based subsamples than for the full sample, consistent with credibility being
important.

We then partition the sample on the basis of whether the rumoured target actually
becomes the target of takeover activity within the 12 months subsequent to the post.
Under an assumption of perfect foresight, “true” rumours should be perceived as
“more credible”. The results provide moderate support for the contention that the
market reaction is greater for rumours perceived as more credible. The mean posting
interval return for the subsample of 24 rumours relating to companies that become a
target is significantly greater than the mean posting interval return for the subsample
of 165 rumours that do not. However, although the mean posting interval volume
for the subsample, which ultimately becomes a target, is larger than that for the
subsampling of companies that do not, the difference is not significant.\(^{21}\)

Finally, in an attempt to draw these sensitivity analyses together, we consider the
following multivariate regression models:

\[
RET = \beta_0 + \beta_1 \text{TIME} + \beta_2 \text{FIRST} + \beta_3 \text{PRIOR} + \beta_4 \text{RESOURCE} \\
\hspace{1cm} + \beta_5 \text{UNREG} + \beta_6 \text{ACCURACY} + \beta_7 \ln \text{SIZE} + \epsilon, \tag{1}
\]

\[
VOL = \gamma_0 + \gamma_1 \text{TIME} + \gamma_2 \text{FIRST} + \gamma_3 \text{PRIOR} + \gamma_4 \text{RESOURCE} \\
\hspace{1cm} + \gamma_5 \text{UNREG} + \gamma_6 \text{ACCURACY} + \gamma_7 \ln \text{SIZE} + \nu, \tag{2}
\]

\(^{21}\) We also partitioned the sample on the basis of whether the poster discloses that they hold
shares of the target company. Here, the poster’s financial interest in a higher share price is
transparent and such posts are more likely to be viewed as attempts to ‘hype the stock’.
Although directionally consistent with the prediction that the market reaction will be greater
for rumours that are perceived as more credible, the results are statistically insignificant.
where $RET$ and $VOL$ are the 10 min posting interval return and relative trading measures, respectively, and the remaining variables in these models are defined as follows:

TIME: a categorical variable assuming the value of 1 if the rumour post is made outside of the hours between 11.00 and 14.59 hours on a trading day and 0 otherwise;

FIRST: a categorical variable assuming the value of 1 if the rumour is the first posted rumour on the target company during the sample period and 0 otherwise;

PRIOR: a categorical variable assuming the value of 1 if the target company has not been identified in the press as likely takeover target during the year preceding the posting of the rumour and 0 otherwise;

RESOURCE: a categorical variable assuming a value of 1 if the target company is in the resources sector (ASX industry codes 1 and 2, gold and other resources) and 0 otherwise;

UNREG: a categorical variable assuming a value of 1 if the target company is in an unregulated industry sector and 0 if regulated (ASX industry codes 15 and 18, media and telecommunications);

ACCURACY: a categorical variable assuming a value of 1 if the target company actually becomes the target of takeover activity within 12 months subsequent to the rumour post and 0 otherwise; and

SIZE: the market capitalization of the target company measured at the end of the financial period immediately preceding the rumour post.

In operationalizing these models, the independent variables have been defined in a manner such that the intercept captures the "base" case (i.e. the rumours for which the market reaction is expected to be the smallest) and all slope coefficients are expected to be positive.

Results based upon these models are presented in Table 4. We initially only include the categorical variables relating to the various sensitivity analyses discussed above and then expand the model to incorporate company size. Results for the return models are presented in Panel A and results for the volume models are presented in Panel B. In both instances, the results essentially reinforce the conclusion that the primary analyses are robust to these potential threats. For the returns models, none of the explanatory variables are significant in either the base or the expanded model, although all coefficients have signs consistent with the directionality implied in Table 3. For the volume models, only the coefficient on TIME is statistically significant (in both models), suggesting that there is relatively smaller volume reaction to posts made during trading hours than overnight or on weekends. Again, all coefficients have signs consistent with Table 3. As a final check, we also consider the linear restriction that the sum of the intercept and slope coefficients on the categorical variables is different from zero. Here, the $p$-values are 0.007 and 0.049 for the returns and volume models, respectively. Therefore, the results of these analyses appear to reinforce the basic conclusion that the market reacts to the posting of takeover rumour in IDS, but that reaction is most noteworthy for rumours likely to be the most informative and most credible.

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Table 4
Cross-sectional regression results

<table>
<thead>
<tr>
<th>Model</th>
<th>Intercept</th>
<th>TIME</th>
<th>FIRST</th>
<th>PRIOR</th>
<th>RESOURCE</th>
<th>UNREG</th>
<th>ACCURACY</th>
<th>In SIZE</th>
<th>Adjusted-R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>0.075</td>
<td>0.087</td>
<td>0.251</td>
<td>0.488</td>
<td>0.013</td>
<td>0.108</td>
<td>0.098</td>
<td>-</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.846)</td>
<td>(0.732)</td>
<td>(0.292)</td>
<td>(0.081)</td>
<td>(0.960)</td>
<td>(0.726)</td>
<td>(0.527)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended</td>
<td>1.932</td>
<td>0.159</td>
<td>0.252</td>
<td>0.399</td>
<td>0.091</td>
<td>0.177</td>
<td>0.122</td>
<td>-0.102</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(0.140)</td>
<td>(0.586)</td>
<td>(0.287)</td>
<td>(0.166)</td>
<td>(0.728)</td>
<td>(0.565)</td>
<td>(0.443)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel A: Returns specification: \( RET = \beta_0 + \beta_1 TIME + \beta_2 FIRST + \beta_3 PRIOR + \beta_4 RESOURCE + \beta_5 UNREG + \beta_6 ACCURACY + \beta_7 \ln SIZE + \epsilon \)

Panel B: Volume specification: \( VOL = \gamma_0 + \gamma_1 TIME + \gamma_2 FIRST + \gamma_3 PRIOR + \gamma_4 RESOURCE + \gamma_5 UNREG + \gamma_6 ACCURACY + \gamma_7 \ln SIZE + \nu \)

Variable definitions: RET and VOL are the 10 min posting interval return and relative trading measures, respectively; TIME is a categorical variable assuming the value of 1 if the rumour post is made between 11.00 and 14.59 hours on a trading day and 0 otherwise; FIRST is a categorical variable assuming the value of 1 if the rumour is the first posted rumour on the target company during the sample period and 0 otherwise; PRIOR is a categorical variable assuming the value of 1 if the target company has been identified in the press as likely takeover target during the year preceding the posting of the rumour and 0 otherwise; RESOURCE is a categorical variable assuming a value of 1 if the target company is in the resource sector (ASX industry codes 1 and 2, gold and other resources) and 0 otherwise; UNREG is a categorical variable assuming a value of 1 if the target company is in an unregulated industry sector, and 0 if regulated (ASX industry codes 15 and 18, media and telecommunications); ACCURACY is a categorical variable assuming a value of 1 if the target company actually becomes the target of takeover activity within 12 months subsequent to the rumour post and 0 otherwise; and SIZE is the market capitalization of the target company measured at the end of the financial quarter immediately preceding the rumour post. P-values reported in parentheses.
4.3.2. Bid–ask spread bias

One final concern relating to our results is that of bid–ask spread bias. Specifically, Lease et al. (1991) argue that ‘when information releases trigger a preponderance of buy or sell orders, average stock price reactions can be exaggerated by the effects of bid–ask spreads’. In addition, they suggest that ‘for samples of securities where percentage bid–ask spreads are relatively large, that is, stocks of smaller firms or firms with low equity capitalization and stocks with high price variability, this order flow bias is of greater concern since the magnitude of the bias is larger’. Clearly, our sample consists predominantly of relatively small stocks. Furthermore, we indeed consider an information release that has the potential to trigger a shift in aggregate demand. Therefore, on the surface, there appears to be reason to consider the effects of a potential bias. Notwithstanding, on first pass we view it as unlikely that our results are being driven by the bias given the relatively small proportion of the sample companies’ outstanding shares that are being traded. For example, the mean (median) proportion of the companies’ outstanding shares traded during the ten-minute posting interval is only 0.031 per cent (0.030 per cent).

Nevertheless, following the suggestion of Lease et al. (1991), we also calculate returns based on the midpoint of the closing bid and ask quotes. The results (not reported) are qualitatively identical to those reported for our primary intraday analyses (Table 2). For example, the mean return for the 10 min posting interval based on the midpoint of the closing bid and ask quotes is 0.426 per cent ($p < 0.001$). Therefore, on the basis of this sensitivity analysis, it would appear that our results are robust to concerns regarding bid–ask spread bias.

5. Conclusion

In the present study, we examine the market reaction to 189 takeover rumour postings in the Hotcopper IDS between 1 May 1999 and 31 March 2000. As previously argued, a priori, there are several reasons to believe that postings in IDS might contain information relevant to the market.

We present abnormal return and trading volume data from an intraday analysis (covering the 13 10 min trading intervals surrounding the posting). We also find supporting interday results. More directly, the results of the intraday analysis indicate that there are significant returns and trading volumes during the 10 min posting interval and significant trading volume during the 10 min interval immediately preceding it. Furthermore, when benchmarked against abnormal return and trading volume data for the same 10 min intervals during the previous trading week, these measures are significantly different for the posting week in the predicted direction. Finally, the results are largely driven by the sample of companies not identified in the press during the year preceding the posting as a likely takeover target. We interpret this evidence as supportive of the hypothesis that the market reacts to the posting of takeover rumours in IDS.

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Nevertheless, although the study indicates a statistically significant association between market activity and the posting of takeover rumours, the results do not appear to support a simple story. The presence of significant returns and trading volume on the day of the posting, and especially during the 10 min posting interval, are consistent with the market reacting to the posting of the takeover rumours. Therefore, we interpret these results, taken in tandem, as providing strong support for our hypothesis (Hypothesis 1) that there is a positive market reaction to the posting of takeover rumours in IDS. In contrast, the presence of daily abnormal returns and trading volumes before the day of posting is consistent with several alternative stories. These stories include the arguments that, having taken a position in the stock, the poster is attempting to manipulate market activity and/or that market participants post-takeover rumours in response to observed increased market activity. However, irrespective of the exact explanation(s) for the abnormal market activity before the posting, we interpret the abnormal market activity concurrent with posting as evidence that the posting of takeover rumours in IDS are viewed as informative.

References


Knapp, R. H., 1944, A psychology of rumour, Public Opinion Quarterly 8, 22–27.


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