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Google attention and target price run ups

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ABSTRACT

We explore the increase in the share prices of target firms before their merger announcements. We use a novelty Google search volume to proxy the market expectation hypothesis according to which firms with an abnormal upward change in Google searches are identified as firms with potential merger activity. We find that Google indicators can explain a larger percentage of the price increase in target firms before their mergers than the Financial Times. However even the Google proxy of the market expectation hypothesis can only explain at best 36% of the target price run ups.

1. Introduction

A number of academic studies have reported that share prices of target firms do increase significantly prior to their merger announcement and have developed two hypotheses to explain such a pattern. According to the insider trading hypothesis (Keown & Pinkerton, 1981), staff from the target, bidding, or financial institution that organized the transaction trade or even pass such information on to relative members. According to the alternative market expectation hypothesis (Jensen & Ruback, 1983), investors, based on publicly available information, manage to predict target firms prior to their merger announcements.

This paper focuses on the latter hypothesis exploring whether the target price run ups are driven by public information. Prior studies have used media coverage to proxy the market expectation hypothesis, with investors being able to predict target firms as long as such information was documented in the media. Early studies in the field (e.g., Pound & Zeckhauser, 1990; Zivney, Bertin, & Torabzadeh, 1996) have focused on the newspaper coverage of a particular column, such as the columns *Heard on the Street* and/or *Abreast of the Market*, with more recent studies (e.g., King, 2009) incorporating a wider coverage of articles with the assistance of databases such as Factiva. The majority of those studies have concluded that media coverage can only explain part of the increase in target share prices prior to their merger announcements. Within the UK literature, Holland and Hodgkinson (1994) explore 86 target firms from 1988 to 1989 and Siganos and Papa (2012) 1059 firms between 1998 and 2010. Within Holland and Hodgkinson's limited sample, rumors covered by Financial Times (FT) drive to a large extent the UK target price run ups. Siganos and Papa report that in line with international literature, FT coverage of rumors can only explain a small percentage of the upwards UK target pattern. However, prior studies have not captured all publicly available information; as an example, none of the prior UK/international studies in the field has incorporated investors' discussions on online sites such as *Hotcopper.com.au*, though Clarkson, Joyce, and Tutticci (2006) and Chou, Tian, and Yin (2010) have found that such merger rumors have a significant impact on firms' share returns. Therefore, prior studies' conclusions may be biased due to the limited news coverage.

Based on the difficulty of capturing all available public information, we explore an alternative approach to proxy the market expectation hypothesis by using the volume of Google searches for target firms. Google is the most widely used web search engine and the only search site that offers historic searching volume data appropriate for academic purposes.[1] If investors encounter a rumor of a potential merger, most investors may use Google to search for further information on the target company before proceeding with a transaction; therefore, firms featured in a rumor are expected to experience an abnormal increase in Google search activity. A few recent studies have reported the significance of Google searches as a measure of investor attention. Da, Engelberg, and Gao (2011) explore the best proxy of investor attention in US firms and find that Google searches capture investor attention earlier than existing proxies, such as

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[1] For a brief review of Google, study http://en.wikipedia.org/wiki/Google (last accessed September 2012).

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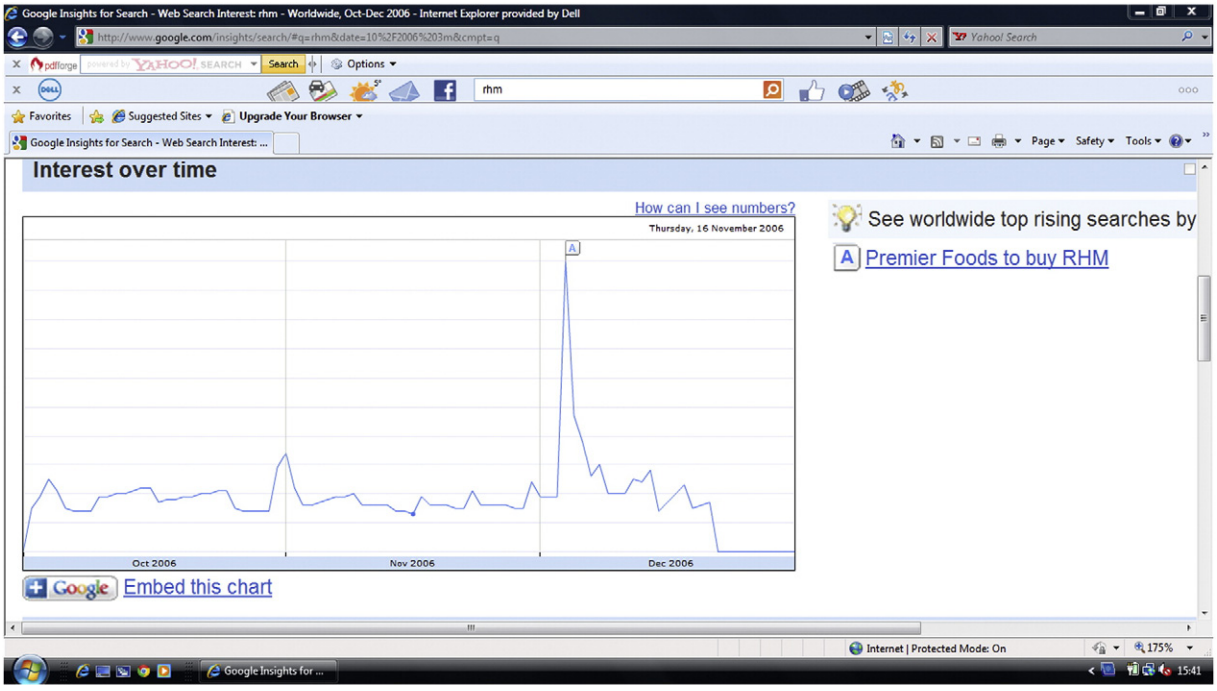

Fig. 1. Google trend search for RHM plc. Notes: This figure represents the daily output for a Google trend search of 'RHM' between October and December 2006. High/low historic trend indicates high/low numbers of searches in Google. Notice that RHM plc was acquired by Premier Foods plc on 4th December 2006.

newspaper coverage, and Bank, Larch, and Georg (2011) support the significance of Google search volume as a proxy of investor attention in German stocks. Other recent studies have also shown the significance of Google searches within alternative fields in finance. Da, Engelberg, and Gao (2012) report that Google searches are value relevant and have the ability to predict firms' revenue surprises, and Drake, Roulstone, and Thornock (2012) report that Google searches are related to firms' price and trading volume levels before and on the earnings announcement day, with firms with high Google activity prior to the announcement experiencing a smaller price and volume response on the announcement day.

We study the Google search volume of target firms within the merger context to explore whether the mergers were expected by investors. We first explore whether Google search volume can predict mergers before such rumors are reported in FT and, second, whether Google attention can explain the target price run ups pattern. As an example, Fig. 1 shows daily Google search volume for RHM plc between October and December 2006; Premier Foods plc acquired RHM plc on 4th December 2006. We find an increase in the volume of RHM's Google search activity a few days prior to the merger announcement: Google attention was 0.13 on 29/11/2006, 0.19 on 30/11/2006, 0.39 on 1/12/2006, 0.59 on 2/12/2006, 0.80 on 3/12/2006, and 1 on 4/12/2006, before moving back to normal levels of Google attention.[2] Between October and December 2006, we have only identified two FT articles that document a potential merger deal for RHM, published on 2/12/2006 (Wiggins & Hume, 2006) and on 3/12/2006 (Wiggins, 2006). There is, therefore, a sign that investors were searching for information on RHM plc earlier than FT covered potential merger activity.

To test our argument, we manually download daily Google activity for 340 UK target firms between March 2004 and December 2010. We adopt the outlier literature to identify abnormal upward changes in Google searches by using the boxplot method (Tukey, 1977), which makes no distributional assumptions. Following an event study analysis, we estimate excess returns of target firms before their merger announcement date and before the first date that abnormal Google activity was signaled. We find that Google indicators tend to offer a takeover signal a few days earlier than FT, and we therefore find that Google indicators explain a larger percentage of the price increase in target firms than a conventional FT coverage proxy. Nevertheless, even after estimating excess returns before the Google merger signals, the target price run ups remain economically and statistically significant, showing that Google indicators cannot fully explain the price pattern. We find that Google can explain at best merely 36% of the target price run ups.

The remainder of the paper is structured as follows. The next section explains the data and methodology used, Section 3 discusses the empirical results and Section 4 concludes the study.

2. Data and methodology

2.1. Data collection

We use Thomson OneBanker to have access to all UK target firms with at least a 50% level of acquisition between March 2004 and December 2010. To be selected in the sample, a target firm should have an available Datastream code in Thomson OneBanker (to link Thomson OneBanker and Datastream), daily share returns[3] and a ticker symbol in Datastream. In line with other studies that have used Google data (e.g., Da et al., 2011), we use the ticker, rather than the name of the firm, to collect data from Google, since tickers are prominently used by investors rather than by consumers interested in a firm's product. The final sample consists of 430 target firms. In unreported results, we

[2] Notice that Google search data are given at a relative value to the total searches in the sample period requested that ranges between 0 and 1, where 1 indicates the day with the maximum number of searches. Also notice that Google search volumes may slightly change when collected at different points in time, since Google calculates the values from a subset of the full archive to increase the response speed. In line with Da et al. (2011), we download results for a few firms within alternative times and find that the correlation of the data is above 0.95; we therefore conclude that our results are not driven by such approximations.

[3] We use the RI data type that incorporates dividend payments in the estimation of share returns.