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Tourism firm restructuring: Does the attention of individual investor matter?

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ABSTRACT

We examine the power of individual investor attention in increasing tourism firms' restructured performance, the different effects caused by 'attention heterogeneity', the moderating effect of media coverage on the relationship between individual investor attention and tourism firms' restructured performance, and the robustness of the effects. The results indicate that 1) individual investor attention has a significant positive effect on tourism firms' restructured performance, 2) individual investor attention via mobile devices influences tourism firms' restructured performance more than attention via computers, 3) the moderating effect of media coverage on this relationship varies with time and media heterogeneity, and 4) the effect of individual investor attention is immediate, while time is needed for the moderating effect of media coverage to appear. The main effect of individual investor attention and the moderating effect of media coverage on tourism firm performance do not depend on the firm size or the proportion of individual shareholders.

1. Introduction

Throughout the world, rapid economic, social and cultural change has been driven by globalization, rapid technological progress, and communication and information revolutions. Tourists, destinations and tourism firms consequently face a turbulent, chaotic and nonlinear tourism environment. Asset restructuring, including mergers and acquisitions, share transfers, asset exchanges, asset stripping and takeovers, is a popular means for organizations to respond to threats and opportunities, avoid bankruptcy and recover from failure, and achieve growth and value creation.

However, it is not clear whether asset restructuring improves the performance of tourism firms. For instance, in relation to hotel firms, Dogru (2017) found that asset restructuring improved performance, but Hsu and Jang (2007) reported that it did not improve performance. Finding the factors that determine the performance of tourism firms after restructuring would therefore be of great value. Possible factors include the firm size (Park & Jang, 2011), the payment method (Yang, Qu, & Kim, 2009), acquisition premiums (Kim & Canina, 2013) and financial characteristics (Dogru, 2017). More general factors are of two types: the location effect and the firm effect (Molina-Azorin, Pereira-Moliner, & Claver-Cortés, 2010). The location effect concerns where a firm is located (e.g., a tourist destination), while the firm effect refers to the organization's internal characteristics, such as its strategic orientation (Avcï, Madanoglu & Okumus, 2011), governance structure (Yeh, 2018) and ownership structure (Al-Najjar, 2015).

A tourism firm's performance after restructuring can be seen in terms of the effect of asset restructuring on the firm's profits or share price. It may be influenced by internal and external factors. External factors involve a 'human effect'. For example, a critical external factor is the investor. Investors' trading behaviours are based on their evaluations of firm value, which, in the present context, is affected by restructuring. Investor attention is a factor that can adjust the evaluation, but this may be a misevaluation. Thus, the reactions of investors to a tourism firm's restructuring may have a significant impact on the performance effect of this restructuring. However, the relationship between investor attention and tourism firms' performance after restructuring is unclear. This study therefore investigates how individual investor attention relates to tourism firms' performance after restructuring. Traditionally, individual investors have been considered to be uninformed and consequently, psychologically biased and noisy traders (Kaniel, Liu, Saar, & Titman, 2012). However, with the development of information and

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communications technology, they have become better informed (because of the convenient access to large quantities of high-quality information via the internet). In previous studies, investors' searches for information on the internet have been used to reflect their attention directly and unambiguously. Investor attention measured as aggregate search frequency was found to increase stock trade volume and stock price (Da, Engelberg, & Gao, 2011). Stock price is a commonly used measure of firm performance after restructuring. The reorganization involved in a firm's restructuring draws the attention of individual investors, which, in turn, affects their evaluations of the added value from the restructuring and their trading behaviours and, thus, possibly the profits and stock prices of restructured firms. We assume that investor attention affects cumulative abnormal returns (as a measure of performance after restructuring) and use an aggregated search frequency through a search engine as a proxy for individual investors' attention.

The asset restructurings of Chinese public tourism firms are used as a baseline to collect samples. A mixed multi-source sample set is assembled from the following three sources: firm size, ownership structure and restructuring information are taken from corporate information; stock prices and firm returns are derived from stock market data; and the individual investor attention given to the restructuring of tourism firms is extracted from a search engine. Here, the investigation of the unknown relationship between the external factors of individual investor attention, attention heterogeneity (whether the attention is via a mobile device or a computer) and the amount of media coverage of the restructuring on the tourism firms' restructured performance is conducted through a standard event study approach. In total, 2,515, 4,917, and 8148 observations related to tourism firms' restructuring between Jan. 1, 2011 and Jun. 30, 2018 are used for our final analysis (depending on the event window chosen). Overall, we make the following four contributions. First, the new external factor of *individual investor attention* is identified as a critical variable that positively affects a restructured tourism firm's performance. Second, attention heterogeneity (defined here by whether the search engine is accessed via a mobile device or a computer) is found to impact tourism firms' performance after restructuring. Third, a moderating effect on this relationship of the amount of media coverage of the firm's restructuring announcement is found; moreover, this effect varies with time and media heterogeneity (defined here as whether 'news' is accessed via a mobile device or a computer). Finally, the effect of attention on performance and the moderating effects of media coverage on this relationship are found to act after different intervals.

The remainder of this paper is structured as follows. The next section reviews the literature and develops the hypotheses. Section 3 describes the methodology of the empirical analysis and the variables. The findings and discussion are then presented in Section 4. The robustness of the findings is tested in the following section. The final section concludes and discusses the implications of the study.

2. Literature review and hypotheses development

2.1. Asset restructuring and performance outside the tourism industry

Asset restructuring is critical to increase business performance. Various aspects of firm performance related to restructuring have been investigated in recent years as follows (Ferreira, Santos, De Almeida, & Reis, 2014): corporate partnerships; diversification and corporate strategy; corporate governance; environmental modelling; governmental, social and political influences on strategy; and the resource-based capabilities of the firm. In this study, we focus on the change in the performance of tourism firms after restructuring, which includes two topics, namely, the ability of restructuring per se to increase performance and the factors that affect the performance of the firm after restructuring.

An event approach and an accounting approach have been used in previous studies to identify whether asset restructuring improves firm performance. The event approach defines an event window as a few trading days before and after the restructuring announcement, and firm performance is judged by changes in stock price, abnormal returns or cumulative abnormal returns (Masulis, Wang, & Xie, 2007). In an accounting approach, post-restructuring accounting variables are used to evaluate the effects of the asset restructuring (Healy, Palepu, & Ruback, 1992). The studies that use these approaches have come to different conclusions regarding the effect of restructuring, with some studies finding that performance improves (Li, Li, & Wang, 2016), while other studies find that it worsens (Halkos & Tzeremes, 2013; Girod & Whittington, 2017).

The factors that affect firm performance after asset restructuring can be categorized as the internal characteristics of restructured firms, the internal characteristics of restructuring, and external factors. The internal firm characteristics include anti-takeover provisions by a target firm (Masulis et al., 2007), the strategy similarity between the firms involved in the restructuring (e.g., in a merger) (Namvar & Phillips, 2013), and the social connections among the directors of the firms (Ishii & Xuan, 2014). The internal factors that relate to restructuring itself include the payment method (King, Dalton, Daily, & Covin, 2004) and restructuring with a related party (Homberg, Rost, & Osterloh, 2009). External influences include the culture (Brock, 2005), the level of development of the capital market (Singh, Mahmood, & Natarajan, 2017), and institutional laws (Xie, Reddy, & Liang, 2017).

2.2. Asset restructuring within the tourism industry

The tourism industry is distinguished by its high degree of competition, high risk, high leverage, and high capital intensity (Singal, 2015). This makes it valuable to investigate the generalizability of business findings on asset restructuring within the tourism industry specifically. Little academic attention has been given to tourism firms' performance after restructuring, although corporate performance per se has been studied in relation to the measures of tourism firms' operational performance (Sainaghi, Phillips, & Zavarrone, 2017), the influences on tourism firms' financial performance (Al-Najjar, 2015; Avcï et al., 2011), and the measures of tourism firms' survival (Li, Xu, Li, & Xu, 2019). The event and accounting approaches described above have produced some evidence on whether asset restructuring increases the performance of tourism firms, but again, the findings have been contradictory, with both better performance (Dogru, 2017; Kim & Canina, 2013; Yang et al., 2009) and worse performance being found (Hsu & Jang, 2007). In one study, even where tourism firms benefitted in the short term from restructuring, the improvement was not maintained and disappeared after two years (Park & Jang, 2011).

Thus, inconsistent effects of asset restructuring on tourism firms' performance are reported. The factors that influence tourism firms' performance after restructuring are therefore of interest. Tourism firm's size, payment method, acquisition premiums, and financial constraints are possible factors. In terms of the *tourism firm size*, both small and large tourism firms experience positive sales growth in the year following restructuring (Park & Jang, 2011). The general finding outside tourism is more specific: large firms commonly have lower abnormal returns after the announcement of a restructuring than small firms (Moeller, Schlingemann, & Stulz, 2004). Similarly, tourism firm size is negatively correlated with the firm's performance (Lee, Upneja, Özdemir, & Sun, 2014). Small tourism firms find it easier to obtain operating synergies and economies of scale, and they therefore offer less resistance to restructuring than large corporations. In terms of the *payment method*, restructurings in the hospitality sector through a cash offer and a stock offer did not produce significantly different abnormal returns on equity (Yang et al., 2009). This finding is inconsistent with the general belief that performance after restructuring decreases after stock deals and increases after cash deals (Li, 2018). The fact that the short-term abnormal returns of public tourism firms with stock offers are not significantly different from the short-term abnormal returns with cash offers may be

attributed to the unique ownership structure of tourism firms, specifically, the large proportion of individual investors. The lack of a significant difference here is also found for non-tourism firms with the same type of ownership structure (Chang, 1998). In terms of the *acquisition premium*, a positive impact is found on the performance of lodging firms that have undergone asset restructuring (Kim & Canina, 2013). However, acquirers with alliance experience yield higher premiums without exhibiting any better or worse post-restructuring performance (Cho & Arthurs, 2018). The acquisition premium after a cash offer depends on the reliability of the evaluation of the value of the target firm and whether the premium can be compensated for by a synergy effect achieved with the restructuring. In terms of *financial constraints*, tourism firms that are financially constrained tend to get better acquisitions than unconstrained firms, which lead to higher abnormal returns (Dogru, 2017). This positive effect of financial constraints on abnormal returns after asset restructuring is also supported by studies of the wider business sector (Khatami, Marchica, & Mura, 2015). Firms with financial constraints that are acquired can improve their resource-based capabilities from the capital market to seize valuable investment opportunities, which brings greater profits.

Accordingly, there are two important points to make regarding the studies of tourism firms' performance after restructuring. First, the reported effects of asset restructuring on tourism firms' performance are inconsistent. Second, internal factors seem to be the main influences on tourism firm performance after restructuring. The inconsistent findings on tourism firms' performance after restructuring may be caused by the omission of some vital variables in these studies.

2.3. Individual investor attention and performance after asset restructuring

Investors' attention affects their decisions, especially in the case of individual investors. Individual investors, with limited time and energy to give to trading, are unable to evaluate hundreds of stock alternatives. As a result, they tend to be net purchasers of the stocks that happen to grab their attention (Barber & Odean, 2008). Individual investor attention may impact firm performance after restructuring in terms of the theories of efficient markets, information asymmetry, information overload, and herd behaviour.

1) *Efficient markets.* The internet makes stock markets more informationally efficient (Zhang, Shen, Zhang, & Xiong, 2013). It accelerates information dissemination (in terms of the speed and range) of tourism firm restructuring to a wide range of investors, customers, public accountants and government regulators. Investors' trading behaviour, which is driven by their attention to asset restructuring, is also accelerated.
2) *Information asymmetry.* The information search activity of investors reflects their attention and helps them to reduce information asymmetry between individuals and the market to thus make more accurate trading decisions. Stocks with more investor attention are more liquid (Bank, Larch, & Peter, 2011), which results in a greater possibility for a performance change after a tourism firm undergoes restructuring.
3) *Information overload.* Individual investors tend to overreact to the stocks that happen to grab their attention because of their limited attention and because they have insufficient time and energy to process a large volume of information. A large volume of favourable media coverage of a firm's restructuring commonly results in individual investors making the decision to purchase the stock within a week, which exerts a positive price pressure (Zhang & Wang, 2015). Tourism firm restructuring may result in individual investors overreacting in purchasing these stocks in the short term.
4) *Herd behaviour.* Inexperienced individual investors often believe that other people who feed them the message, who may be experienced investors, have an information advantage (Calvo & Mendoza, 2000). To obtain a sense of security (Goldbaum, 2008), or due to the reputation of mutual fund managers (Swank & Visser, 2008), individual investors tend to follow other investors' attention and behaviour. This herd behaviour of individual investors may cause a correlation in response to a tourism firm's restructuring, and even where this response is mistaken, it may become systematic.

Accordingly, individual investor attention on tourism firm restructuring is strongly correlated with stock trading volume, liquidity and volatility; it exerts a *positive* price pressure in the short term and thus possibly causes abnormal returns.

Traditionally, *indirect* proxy variables are used to measure investor attention, such as price limits (Seasholes & Wu, 2007), abnormal returns and trading volume (Barber & Odean, 2008), prior turnover (Loh, 2010), advertising expense (Lou, 2014), and news and headlines (Yuan, 2015). However, these indirect proxies inaccurately estimate individual investor attention. Proxies related to the capital market, such as price, returns, trading volume and prior turnover, can be affected by factors unrelated to investor attention, such as the macroeconomic environment. Advertising expenditure shows how much firms wish to receive attention, while news and headlines are proxies of the media attention achieved (Da et al., 2011). All of these influences are therefore not reasonable proxy variables for individual investor attention. Individual investors commonly use search engines to access information when they are interested in a stock. Aggregate search frequency in a search engine, e.g., Google or Baidu, is a *direct* and *unambiguous* measure of individual investor attention. Search volume therefore estimates individual investor attention more accurately than traditional proxies.

Tourism is more sensitive to the attention of individual investors than other sectors. Tourism is more attractive to individual investors because of three factors, namely, a *booming industry*, *leading firms*, and the *chain effect*.

1) *Booming industry.* A booming industry attracts more attention. In the past ten years, although the world has experienced complex economic fluctuations, international tourism receipts have continued to grow. According to the World Tourism Organization, in 2018, international tourism receipts totalled 1458 USD billion. An industry with such a large earning ability readily receives the attention of individual investors.
2) *Leading firms.* Leading firms, which have more advantages in brand popularity, economies of scale, patents, and the network effect, tend to gain more attention from individuals. Public tourism firms with such a competitive edge receive more media exposure and are thus apparently easily discovered targets that draw individual investor attention.
3) *Chain effect.* Individuals tend to care more about the corporations that they come into direct contact with. Tourism has become an essential need in people's daily life. Public tourism firms that provide abundant services are easily recognized by the tourists who also investors.

Furthermore, tourism is more susceptible to the attention of individual investors because of the *firm age effect*. Studies have found that younger and smaller firms are more affected by investor sentiment (Baker & Wurgler, 2007), and as an emerging industry, most public tourism firms are younger and smaller than traditional industrial firms. Thus, the sentiment of a large proportion of individual investors affects tourism firms more. Finally, it has been found that the payment method does not significantly impact the performance after restructuring for the firms with an ownership structure with a large proportion of individual investors (Chang, 1998). No significant abnormal returns were reported from hospitality restructurings through cash and stock offers (Yang et al., 2009).

Two types of devices are used by individual investors to search for information on tourism firms' restructuring on the internet, i.e., a

computer or a mobile device. To differentiate the effects of individual investor attention on tourism firms' performance after restructuring, the following hypotheses are formulated.

H1. Individual investor attention via a computer positively affects tourism firms' performance after restructuring.

H2. Individual investor attention via a mobile device positively affects tourism firms' performance after restructuring.

Investor attention varies with the time and information source (Deng & Liu, 2018), which are two types of 'attention heterogeneity'. In relation to attention heterogeneity over time, investor attention on a weekday may immediately affect the stock trade, while attention on a weekend will have a deferred impact on stock purchasing. Attention heterogeneity also arises from the information source, because top trending searches, social media, and financial websites may have different impacts on investors' trading behaviours. Attention heterogeneity can also relate to search platforms, which have different advantages and corresponding users of different ages that consist of an *age effect, a location effect,* and a *frame-of-mind effect*.

1) *Age effect.* A computer with a large screen, wired internet access, and peripherals has been widely used to access the internet and multimedia text, picture, audio, flash and video content since the internet search era began in 1998. Thus, attention to a tourism firm's restructuring via a computer is more likely to come from older and thoughtful investors, who might prefer to look before they leap. In contrast, the widespread use of mobile devices to access the internet began only circa 2008. Attention to a tourism firm's restructuring via a mobile device is therefore more likely to come from young and brisk investors who are ready to take immediate action.
2) *Location effect.* A location limitation exists when information on tourism firms' restructuring is searched for via a computer, especially a desktop computer, which will be installed in a particular place. In contrast, individuals can search for information via a mobile device at almost any time and any location. Thus, attention to tourism firm restructurings via a mobile device is timely, whereas a delay can be expected when the user does not have immediate access to their desktop computer.
3) *Frame-of-mind effect.* The office atmosphere of a workspace with a computer and its peripherals may give individuals a sense of formality, which makes them behave rationally in moving from giving attention to actual purchasing. Conversely, the often-casual nature of mobile use may lead individual investors to be rasher in their trading. Thus, investor attention via a mobile device may bring a larger volume of stock purchasing over less time than investor attention via a computer.

Thus, we construct the following hypothesis.

H3. Individual investor attention from computer users has a lower impact on tourism firms' performance after restructuring than attention from the users of mobile devices.

The number of news items about each tourism firm on each day indicates media coverage. Media coverage negatively impacts stock returns, and conversely, there is a no-media premium (Fang & Peress, 2009). High media coverage can present individual investors with more fragmented information, and the resulting distraction extends the time taken to transform investor attention into trading action (i.e., it delays the purchase of stocks). More media coverage brings more newly driven searches, which negatively moderates the influence of individual investor attention on stock returns (Liu & Ye, 2016). Where there is low media coverage, individual investors have to undertake more self-initiated searches before they purchase stocks. Thus, according to the above findings, media coverage will negatively moderate the relationship between investor attention and tourism firms' performance after restructuring. However, we argue that the moderating effect of media coverage on the relationship may differ with the media platform (mobile or computer); we term this 'media heterogeneity'. As suggested by the discussion above, this is a combined result of the *age effect, location effect*, *frame-of-mind effect*, and *knowledge-gap effect of media coverage*.

1) *Age effect in media coverage.* The users of mobile devices are on average younger than computer users. The users of mobile devices are less experienced and more impulsive. However, the large quantities of mobile news can confuse users about the influence of tourism firms' restructuring, and this may delay or even end otherwise impulsive purchases. Computer users are more experienced and rational. Furthermore, because they are at a computer, they are able to analyse massive amounts of multi-media restructuring news with software assistance. After taking some time to evaluate the news, any purchases made will reflect the value of the restructuring.
2) *Location effect in media coverage.* Tourism restructuring news can be accessed through a mobile device at almost any time and any location, which immediately delivers the impact of mobile news on individual investors. Under this pressure, it is not easy for mobile investors to find a quiet place with sufficient time to process the information on restructuring. Mobile investors may be distracted or discouraged from in-depth searching, which results in them giving less consideration to their investment decisions. Conversely, more time and a more conducive environment are available to computer users to analyse massive amounts of computer news; thus, the transfer of individual attention to purchasing may be late but not absent.
3) *Frame-of-mind effect in media coverage.* The sense of formality that accompanies the use of an office computer helps individuals to correctly evaluate the value of an asset restructuring, identify a mispriced restructuring, and, therefore, to find a premium. The typically casual use of a mobile device may encourage individuals to give less consideration to the true value of a restructuring.
4) *Knowledge-gap effect in media coverage.* A computer – with its large screen and more convenient operating system – provides a richer information environment than a mobile device. Individual investors who access news on restructurings from a computer can conveniently read and analyse this news, integrate messages and obtain a comprehensive picture even from fragmented information, which allows them to absorb different views in forming a comprehensive picture of a particular restructuring. Correspondingly, individuals with a computer will make a correct evaluation of the impact of asset restructuring on tourism firms. However, for the same restructuring, news on mobile devices is usually more concise, with more click baits than website news, to fit the small screen and reduce the reading time. With their small screens, there is more fragmentation of restructuring news on mobile devices. The integration of fragmented information in mobile news reports is more difficult than on a computer because of its small screen, which may severely extend the time required to process the information and take trading action after noticing information on a tourism firm's restructuring. A less comprehensive picture of a particular restructuring is often formed for mobile users. Thus, a knowledge gap exists between mobile users and computer users for the same restructuring, which may differentiate the moderating effect of media coverage via different platforms on the relationship between attention and performance. Therefore, we propose the following hypotheses.

H4. Media coverage accessed via a computer positively moderates the effect of individual investor attention on tourism firms' performance after restructuring.

H5. Media coverage accessed via a mobile device negatively

moderates the effect of individual investor attention on tourism firms' performance after restructuring.

3. Methodology

3.1. Method

This study follows the event approach to explore the impact of individual investor attention on tourism firms' performance after restructuring. Public firms frequently use asset restructuring to respond to the rapidly developing and changing economic environment. Some tourism firms restructure more than once a year. We cannot differentiate the effects of different restructurings if a new restructuring occurs within the observation period. The performance variation of tourism firms cannot be attributed to asset restructuring in the long run if the other variables that influence firm performance are not controlled. Thus, we investigate the short-term effect of individual investor attention on tourism firms' performance after restructuring to avoid noisy information and the variables that the present study was unable to control for.

The announcement day of a tourism firm's restructuring is set as date $t = 0$. The event window is defined as either one day before to one day after date t, which is termed -1 to $+1$ (Ishii & Xuan, 2014), or two days before to two days after date t, which is termed -2 to $+2$ (Masulis et al., 2007). To consider the time effect of the individual investor's response, the event window is defined as 2 days, 5 days, and 10 days before and after date t, which is termed -2 to $+2$, -5 to $+5$, and -10 to $+10$. To reduce the influence of the restructuring announcement as much as possible, the estimation period is defined as an event window that spans 180 days–31 days before the event date, which is termed -180 to -31.

3.2. Data collection

Data are collected from two databases. The descriptions of tourism firms' restructurings, stock prices and firm characteristics are collected from the Chinese stock market accounting research database, which contains information from public firms, the stock market, funds, the bond market, derivatives, and the money market. The data on individual investor attention are collected from the Baidu database, which is a dominant internet search engine in China. It provides a keyword index of daily searches according to devices from 2011. The daily aggregate search volumes that relate to all tourism firms from a computer or a mobile device indicate individual investor attention. The number of new items about each tourism firm available on computers or mobile devices each day indicates media coverage. Both of these sets of data were collected from the Baidu database by using tourism stock names as keywords that were matched with the restructuring data and tourism firm data.

The following rules were followed to clean the data. First, the tourism firms were only those traded on the Shanghai Stock Exchange or the Shenzhen Stock Exchange. Second, all considered restructurings of tourism firms started after Jan. 1, 2011 and finished before Jun. 30, 2018 to match the data from the two databases. Third, multiple restructurings of a tourism firm in one day were treated as one restructuring, because their impacts cannot be differentiated. Fourth, for the same reason, where there were multiple restructurings within an event window, the asset restructuring with the highest expense was recorded. Initially, 578 tourism restructurings were identified. After data cleaning, 503 tourism restructurings in the -2 to $+2$ event window, 447 tourism restructurings in the -5 to $+5$ event window, and 388 tourism restructurings in the -10 to $+10$ event window remained. Approximately 5 per cent of the restructurings involved a suspension of trading, and in these cases, the cumulative abnormal returns are set as zero for the relevant period.

3.3. Variables

(1) Dependent variable

This study uses the cumulative abnormal return (Ishii & Xuan, 2014; Masulis et al., 2007) to assess tourism firms' performance after restructuring. Car_{it} is the sum of the daily abnormal returns in an event window:

$$Car_{it} = \sum AR_{it} \tag{1}$$

Abnormal return (AR_{it}) is the difference between the realized return (R_{it}) and the expected return (ER_{it}) of tourism firm i on day t in an event window:

$$AR_{it} = R_{it} - ER_{it} \tag{2}$$

The daily return of tourism firm i on day t is denoted by R_{it}, the average daily return of all shares in stock market is denoted by R_{mt}, and the relationship between the two is expressed as equation (3). For any given estimation period, the coefficient a and the constant b can be calculated, which leaves e as the estimation error. The expected return within an event window is calculated with formula 4, which, in turn, allows AR_{it} and Car_{it} to be computed. A day in the event window is denoted by t, and a day in the estimation window is denoted by t_1.

$$R_{it1} = a_i R_{mt1} + b_i + e_i \tag{3}$$

$$ER_{it} = a_i R_{mt} + b_i \tag{4}$$

(2) Independent variable

The independent variable is individual investor attention. Individual investor attention via computer is denoted by $PC\_Searchvolume_{it}$, which is the search volume of tourism firm i via computer on day t with Baidu. Individual investor attention via a mobile device is denoted by $MD\_Searchvolume_{it}$, which is the search frequency of tourism firm i via a mobile device on day t with Baidu. To measure individual investor attention drawn by tourism firms' restructurings within an event window, the abnormal search volume in the window is calculated by using formula 5, that is, by subtracting the first 30 days' average search volume (Drake, Roulstone, & Thornock, 2012). Alternatively, we also define abnormal $PC\_Searchvolume_{it}$ by subtracting the first 60 days' average search volume, as in formula 6 (and similarly for $MD\_Searchvolume_{it}$). The Z-score is used to standardize the abnormal $PC\_Searchvolume_{it}$ (formula 7), and this is denoted by $Ab\_PC\_SV_{it}$.

$$abnormalPC\_Searchvolume_{it} = PC\_Searchvolume_{it} - \frac{1}{30}\left(\sum_{t-1}^{t-31} PC\_Searchvolume_{it}\right) \tag{5}$$

$$abnormalPC\_Searchvolume_{it} = PC\_Searchvolume_{it} - \frac{1}{60}\left(\sum_{t-1}^{t-61} PC\_Searchvolume_{it}\right) \tag{6}$$

$$ZabnormalPC\_Searchvolume_{it} = (abnormalPC\_Searchvolume_{it} - mean(abnormalPC\_Searchvolume_{it})) / sd((abnormalPC\_Searchvolume_{it}) \tag{7}$$

(3) Moderating variables

Media coverage is the moderator in this study. With the development of the internet, increasingly more people read and watch online news. The Baidu media index is a measure of media coverage. $Mediacoverage_{it}$

Table 1
Variables.

Variable	Definition
Car_{it}	Cumulative abnormal return of tourism firm i on day t
$PC\_Searchvolume_{it}$	Aggregate computer search volume of tourism firm i on day t.
$Ab\_PC\_SV_{it}$	Abnormal computer search volume of tourism firm i on day t, calculated from formula 5 or 6 and then standardized with formula 7.
$MD\_Searchvolume_{it}$	Aggregate mobile device search volume of tourism firm i on day t.
$Ab\_MD\_SV_{it}$	Abnormal mobile search volume of tourism firm i on day t, calculated from formula 5 or 6 and then standardized with formula 7.
$Mediacoverage_{it}$	Number of news items about tourism firm i on day t.
Ab_MC_{it}	Abnormal media coverage, calculated through formula 8 or 9 and then standardized through formula 10.
Firm_size	This variable is given a value of 1 when the total market value of tourism firm i on the day of the restructuring announcement is larger than the mean value of all tourism firms or is 0 otherwise.
Institutional_shareholding_ratio	This variable is given a value of 1 when the institutional shareholding ratio of tourism firm i on the day of the restructuring announcement is higher than the mean value of all tourism firms or is 0 otherwise.

represents the number of news items that relate to tourism firm i on day t from Baidu. To measure the media coverage driven by a tourism firm's restructuring, abnormal media coverage within an event window is calculated from formulas 8-10.

$$abnormalMediacoverage_{it} = Mediacoverage_{it} - \frac{1}{30}\left(\sum_{t-1}^{t-31} Mediacoverage_{it}\right) \tag{8}$$

$$abnormalMediacoverage_{it} = Mediacoverage_{it} - \frac{1}{60}\left(\sum_{t-1}^{t-61} Mediacoverage_{it}\right) \tag{9}$$

$$ZabnormalMediacoverage_{it} = (abnormalMediacoverage_{it} - mean(abnormalMediacoverage_{it})) \,/\, sd((abnormalMediacoverage_{it})) \tag{10}$$

(4) Control variables

Two time-varying variables, namely, firm size and the institutional shareholding ratio, are used as the control variables. Firm size is correlated with the performance of tourism firms after restructuring (Park & Jang, 2011), and more specifically, seems to have a negative influence on tourism restructuring (Lee et al., 2014). Thus, to produce the same effect, the amount of individual investor attention given to the restructuring of a small tourism firm will be less than the amount of attention given to the restructuring of a large tourism firm. To control the impact of the tourism firm size on the relationship, we include firm size as a control variable.

The institutional shareholding ratio is the proportion of a tourism firm's shares that are held by institutions. The effect of individual investor attention on tourism firms' performance after restructuring may be different for firms with different institutional shareholding ratios. When there are more individual investors in a tourism firm, the impact of their attention will be greater on a restructuring. To control the impact of the volume of individual investors on the relationship, we include the institutional shareholding ratio as a control variable.

In addition, we introduce event-level fixed effects and time fixed effects in our model. The benefit of controlling event-level fixed effects is that all other time-invariant or slowly varying features of the firms and events, such as the firm's registered capital, the quality of the reorganization process, and the manager team's restructuring experience, can be absorbed (Huang, Taflti & Mithas, 2018; Zhang, Liang, Li, & Zhang, 2019). In addition, we directly control for external shocks, such as a government policy change, by including the time fixed effects. Table 1 lists all the variables.

3.4. Empirical model

Model 1 estimates the relationship between individual investor attention and tourism firms' performance after restructuring, where δ_i and μ_t are the event and daily fixed effects, respectively. Unlike previous models that investigate the relationship between investor attention and stock price, our model of the effect of individual investor attention on tourism firms' performance after restructuring is one of the first to use the cumulative abnormal return as the dependent variable. Furthermore, we examine the effects of investor attention on tourism firm performance and, in particular, the extra attention from individual investors caused by restructuring announcements. Moreover, we supplement the attention heterogeneity theory by further differentiating investor attention via computer and via mobile device and additionally propose a media heterogeneity set of hypotheses. Model 1 estimates investor attention and its impact more accurately than previous models by using the daily search volume rather than the weekly search volume.

$$\begin{aligned} \text{Model1}: Car_{it} = {} & \alpha + \beta_1 Ab\_PC\_SV_{it} + \beta_2 Ab\_MD\_SV_{it} \\ & + \beta_3 Ab\_MC_{it} \times Ab\_PC\_SV_{it} + \beta_4 Ab\_MC_{it} \times Ab\_MD\_SV_{it} \\ & + \beta_5 Firm\_size + \beta_6 Institutional\_shareholding\_ratio + \delta_i + \mu_t \\ & + \varepsilon_{it} \end{aligned} \tag{11}$$

4. Results and discussion

4.1. Descriptive statistics

Table 2 shows the original and the standardized data for all the variables in an event window of −5 to +5, where 447 tourism firms' restructurings in the 11-day interval generate 4917 observations. To investigate heterogeneity in the event windows, windows −2 to +2 and −10 to +10 are included, and these have 503 and 388 tourism firm restructurings in the 5- and 21-day intervals and generate 2515 and 8148 observations, respectively. The standardized independent variables are close to being normally distributed and are therefore suited to an ordinary least squares regression.

4.2. Effect of individual investor attention on tourism firms' performance after restructuring

We build a fixed-effects regression to investigate the relationship between individual investor attention and tourism firms' performance after restructuring, with a random-effects regression as a supplement. As the data consist of the population of tourism firms' restructurings within the observation period, the results of the fixed-effects regression are dominant. By manipulating the size of the event window, i.e., 5 days, 11 days or 21 days, and the basis for calculating abnormal search volume, i.e., subtraction of the average volume of the first 30 days or 60 days, we

Table 2
Variable statistics.

Variable		Obs.	Mean	Sd.	Min.	Max.
Original data	*Car*	4917	0.0017	0.0866	−0.4986	0.6617
	Firm_size	4917	0.2260	0.4182	0	1
	Institutional_shareholding_ratio	4917	0.3960	0.4891	0	1
	$PC\_Searchvolume_{it}$	4917	623.6899	812.3639	0	9338
	$MD\_Searchvolume_{it}$	4917	884.5419	2253.6410	0	8842
	$Mediacoverage_{it}$	4917	5.8705	24.8743	0	804
Standardized data	$Ab\_PC\_SV_{it}$	4917	0.0000	0.9199	−2.7296	3.0136
	$Ab\_MD\_SV_{it}$	4917	0.0000	0.9210	−2.9243	3.0123
	Ab_MC_{it}	4917	0.0000	0.8873	−2.7210	3.0147

Table 3
Results of model 1 in the 5-day event window.

	Car(1)				*Car*(2)			
Ab_PC_SV	0.0022* (2.07)	0.0021[a] (1.92[b])	0.02211* (2.05)	0.0021 (1.89)	0.0024* (2.23)	0.0023* (2.10)	0.0024* (2.21)	0.0022* (2.07)
Ab_MD_SV	0.0057*** (5.29)	0.0056*** (5.20)	0.0058*** (5.36)	0.0057*** (5.30)	0.0056*** (5.27)	0.0056*** (5.19)	0.0057*** (5.36)	0.0057*** (5.31)
Ab_MC×Ab_PC_SV			0.0002 (0.13)	0.0001 (0.10)			−0.0001 (−0.004)	−0.0001 (−0.08)
Ab_MC×Ab_MD_SV			−0.0016 (−1.12)	−0.0020 (−1.38)			−0.0016 (−1.13)	−0.0020 (−1.40)
Firm_size	0.0064 (1.17)		0.0064 (1.17)		0.0064 (1.17)		0.0064 (1.17)	
Institutional_shareholding_ratio	0.0030 (0.63)		0.0030 (0.64)		0.0029 (0.63)		0.0030 (0.64)	
cons	0.0024 (0.75)	0.0019 (1.08)	0.0025 (0.19)	0.0022 (1.25)	0.0024 (0.75)	0.0018 (1.03)	0.0026 (0.80)	0.0022 (1.22)
Time_fixed_effect		✓		✓		✓		✓
Event_fixed_effect		✓		✓		✓		✓
Number_of_events	503	503	503	503	503	503	503	503

Note: *a* means coefficient, *b* means the *z* or *t* value.*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. *Car(1)* is computed with a subtraction of 30 days' average volume, and *Car(2)* is computed with a subtraction of 60 days' average volume.

Table 4
Results of model 1 in the 11-day event window.

	Car(1)				*Car*(2)			
Ab_PC_SV	0.0025** (2.53)	0.0025* (2.49)	0.0027** (2.72)	0.0027** (2.68)	0.0035*** (3.58)	0.0035*** (3.59)	0.0037*** (3.81)	0.0037** (3.82)
Ab_MD_SV	0.0087*** (8.83)	0.0087*** (8.75)	0.0090*** (9.03)	0.0089*** (8.95)	0.0088*** (8.97)	0.0086*** (8.87)	0.0089*** (9.17)	0.0088*** (9.07)
Ab_MC×Ab_PC_SV			0.0004[a] (0.37[b])	0.0002 (0.21)			0.0003 (0.23)	0.0001 (0.09)
Ab_MC×Ab_MD_SV			-.0027* (−2.46)	-.0026** (−2.37)			−0.0027* (−2.48)	−0.0026* (−2.40)
Firm_size	−0.0004 (−0.05)		−0.0004 (−0.05)		−0.0004 (−0.05)		−0.0004 (−0.05)	
Institutional_shareholding_ratio	0.0041 (0.59)		0.0043 (0.61)		0.0041 (0.59)		0.0043 (0.61)	
cons	0.0017 (0.04)	0.0006 (0.23)	0.0005 (0.10)	0.0010 (0.41)	0.0002 (0.04)	0.0004 (0.15)	0.0005 (0.11)	0.0008 (0.34)
Time_fixed_effect		✓		✓		✓		✓
Event_fixed_effect		✓		✓		✓		✓
Number_of_events	447	447	447	447	447	447	447	447

Note: *a* means coefficient, *b* means the *z* or *t* value.*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. *Car(1)* is computed with a subtraction of 30 days' average volume, and *Car(2)* is computed with a subtraction of 60 days' average volume.

conduct in total 6 separate analyses of the empirical data. Tables 3–5 present the results of model 1 for the 5-day, 11-day and 21-day event windows, respectively. The results of the hypotheses testing are summarized in Table 6.

As shows in columns 2–3 and 6–7 of Tables 3–5, no matter whether the event fixed effects and time fixed effects are controlled or not, the coefficients of *Ab_PC_SV* and *Ab_MD_SV* are significantly positive, at least at the 5% level, except for the coefficient of *AB_PC_SV* with a two-way fixed effect in the 5-day event window (coefficient = 0.0021, $t = 1.92$, and $p = 0.055$ in Table 3), but it is in fact significant at the 10% level. Individual investor attention via both computer and mobile device has positive effects on tourism firms' restructuring, i.e., H1 and H2 are generally supported. Information communication via the internet reduces information asymmetry. Individual investors can conveniently access accurate messages on restructuring tourism firms by searching for the disclosure materials required by the Securities Supervision Commission. The search behaviour in the more efficient market afforded by the internet helps individual investors to undertake more effective trading, but tourism firms that receive high levels of attention tend to be overvalued by individual investors. However, a reduction in information asymmetry between individual investors and the market can lead to information overload for these investors, and they thereby exert an abnormal positive price pressure on tourism stocks from their attention. The herd effect of individual investors exerts more positive price pressure and causes cumulative abnormal returns. Through this mechanism, individual investor attention positively affects tourism firms' performance after restructuring.

In addition, the coefficient of *Ab_MD_SV* is larger than the coefficient

Table 5
Results of model 1 in the 21-day event window.

	Car(1)				*Car*(2)			
Ab_PC_SV	0.0026**	0.0027**	0.0027**	0.0027[a] (2.82[b])	0.0044***	0.0045***	0.0045***	0.0045***
	(2.74)	(2.80)	(2.78)		(4.71)	(4.80)	(4.76)	(4.82)
Ab_MD_SV	0.0108***	0.0109***	0.0110***	0.0115***	0.0100***	0.0101***	0.0103***	0.0103***
	(11.38)	(11.47)	(11.59)	(11.67)	(10.69)	(10.1)	(10.95)	(10.95)
Ab_MC×Ab_PC_SV			0.0021* (2.13)	0.0021* (2.18)			0.0018 (1.90)	0.0019* (1.96)
Ab_MC×Ab_MD_SV			−0.0033**	−0.0033**			−0.0033**	−0.0033**
			(−3.46)	(−3.44)			(−3.48)	(−3.45)
Firm_size	−0.0067		−0.0065		-.0067		−0.0065	
	(−0.66)		(−0.65)		(−0.66)		(−0.65)	
Institutional_shareholding_ratio	0.0066 (0.76)		0.00681 (0.77)		0.0066 (0.76)		0.0068 (0.78)	
Cons	−0.0014	0.0030291	−0.0013	0.0031 (0.92)	−0.0014	0.0025 (0.75)	−0.0013	0.0026 (0.70)
	(−0.26)	(0.79)	(−0.24)		(−0.26)		(−0.23)	
Time_fixed_effect		✓		✓		✓		✓
Event_fixed_effect		✓		✓		✓		✓
Number_of_events	388	388	388	388	388	388	388	388

Note: *a* means coefficient, *b* means the *z* or *t* value.*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. *Car(1)* is computed with a subtraction of 30 days' average volume, and *Car(2)* is computed with a subtraction of 60 days' average volume.

Table 6
Hypotheses testing.

Event_window	5 days	11 days	21 days
Subtraction of the first 30 days' average volume	Context_1 H1: M_Supported H2:Supported H3:Supported H4: Not_supported H5: Not_supported	Context_2 H1:Supported H2:Supported H3:Supported H4: Not_supported H5:Supported	Context_3 H1:Supported H2:Supported H3:Supported H4:Supported H5:Supported
Subtraction of the first 60 days' average volume	Context_4 H1:Supported H2:Supported H3:Supported H4: Not_supported H5: Not_supported	Context_5 H1:Supported H2:Supported H3:Supported H4: Not_supported H5:Supported	Context_6 H1:Supported H2:Supported H3:Supported H4: M_Supported H5:Supported

Notes: For H1 in Context-1, the fixed-effects models are marginally significant, i.e., significant if the level is loosened to 0.1, and the random-effects models are significant. For H4 in Context-6, the fixed-effects models are significant, and the random-effects models are marginally significant. They are both labelled M_Supported.

of *Ab_PC_SV* in each context, which indicates that individual investor attention via a mobile device has a stronger effect on tourism firms' restructuring than attention via a computer. Thus, H3 is supported: the effect of investor attention is influenced by attention heterogeneity. Currently, mobile devices enable individual investors to search for information about tourism firms' restructuring and to trade anytime from anywhere, which is the style preferred by young individuals. The transfer of investors' trading platform to a mobile device from a computer speeds up the impact of investor attention, as less time is needed for information searching and stock trading. The fragmentation of information on a small screen accentuates the information-overload effect and the herd effect, leads to an overestimation of the restructured tourism firm's value, and thus increases both the positive price pressure and the cumulative abnormal returns. Individual investors who use a computer cannot always be immediately aware of tourism firms' restructurings since a computer (and, therefore, the internet) is not always available. If restructuring announcements are seen by individual investors only when they are sitting at their computer and probably in a formal frame of mind, their trading decisions are more likely to reflect a more thoughtful consideration of fragmented information. In contrast, individual investors may feel compelled to act instantly whenever (and wherever) they are alerted via their mobile device to a news item on a restructuring. The herd effect may be amplified by the fact that the people who use mobile devices are younger and, therefore, less experienced. Thus, the convenience of a mobile device comes at the price of imperfect information and an overreaction to tourism stock, which magnifies the effect of attention on the share price and generates a stronger effect of attention via a mobile device than via a computer on tourism firms' performance after restructuring.

4.3. Moderating effect of media coverage

The moderating effect of media coverage on investor attention's effect on tourism firms' performance after restructuring is complex. In the 5-day event window, the moderating effect of media coverage is insignificant for individual investor attention via either computer or mobile device. In the 11-day event window, the moderating effect of media coverage accessed via a mobile device is significantly negative on the relationship, i.e., H5 is supported, but it is insignificant for media coverage accessed from a computer; thus, H4 is not supported. In the 21-day event window, the moderating effect of media coverage accessed via a mobile device on the relationship is significantly negative, and the moderating effect of media coverage from a computer becomes significantly positive; therefore, H4 and H5 are generally supported.

The results indicate that the moderating effect of media coverage on the relationship between investor attention and tourism firms' performance after restructuring varies with time and media heterogeneity. More specifically, after tourism firms make a restructuring announcement, the moderating effect of media coverage is insignificant in the −2 to +2 event window. Thereafter, media coverage accessed via a mobile device has a negative moderating effect on the relationship in both the −5 to +5 and the −10 to +10 event windows, while a significant positive moderating effect on the relationship when media coverage is accessed via computer appears only in the −10 to +10 event window. After a restructuring announcement, news about a firm's future and management begins to be posted on the internet. However, time is needed for the media coverage to exert an influence on individual investors. The findings indicate that on the one hand, approximately 3–5 days are needed for media coverage to impact individual investors who use mobile devices; after this period, they seem to be overloaded with fragmented information, cease to purchase the stock of restructured tourism firms and give up on in-depth information searches. On the other hand, approximately 6–10 days are needed for investors who use a computer to comprehensively analyse large amounts of restructuring news to find mispriced tourism firms for trading. This time-varying moderating effect of media coverage is related to the convenience of mobile devices, the user's frame of mind at the time of the evaluation, the ability of computers to reduce the knowledge gap, and users' level of

experience related to age.

Moreover, media heterogeneity exerts contrasting moderating effects. A negative moderating effect of media coverage via a mobile device on the relationship is evidenced, whereas a positive moderating effect of media coverage via a computer is supported. News about tourism firms' restructurings accessed via computer or mobile device takes different times to make its impact. A tourism restructuring announcement may panic individual investors who use a mobile device and cause them to purchase more tourism firms' stocks that catch their attention because they are less experienced, more impulsive and more likely to follow the herd. However, large amounts of mobile news makes mobile investors hesitate, and sometimes even cease, to invest in tourism restructuring firms, as individuals are overloaded by information and need more time to process it. As a result, the investment is delayed. After approximately 3–5 days of accessing news on a restructuring via a mobile device, individual investors experience information overload. They begin to make blurry estimations of tourism restructuring firms' values and feel uncertain about their decisions on trading stocks, which reduces the herd effect. After approximately 6–10 days of accessing mobile restructuring news, individual investors experience more information overload, and the knowledge gap between them and computer investors is enlarged. Thus, investors who access restructuring news via a mobile device abandon more attempts to invest in tourism restructuring firms. As a result, tourism firms' cumulative abnormal returns decrease, and performance after restructuring improves only slowly. Individual investors who access restructuring news via a computer need at least 5 days to analyse the information. After approximately 6–10 days of accessing news related to restructurings via a computer, individual investors can find mispriced tourism restructuring firms and make an investment. As a result, tourism firms' cumulative abnormal returns increase, and after restructuring, performance quickly improves.

4.4. Effect of the control variables

According to our findings, firm size does not have a significant impact on the relationship between individual investor attention and tourism firms' performance after restructuring. Both large and small restructured firms experience positive abnormal returns in the tourism context, while large restructured firms have lower post-announcement abnormal returns in the business context. Similarly, institutional shareholding does not have a significant influence on the relationship, which may be attributed to the large overall proportion of individual shareholders in the tourism sector.

5. Robustness testing

The findings may be purely coincidental. Inspired by the idea of verifying coincidences in model comparisons from the field of machine learning, we conduct a non-return random resampling of the data for the 11- and 21-day event windows to test the hypotheses in contexts 2 and 3 (see Table 6) as examples, as they cover the main findings. As time is needed for media coverage to have its moderating effect on the relationship, the 5-day event window is not used. The random re-sampling process is repeated 30 times. We run model 1 on the 30*2 new datasets, and the results are summarized in Table 7.

Table 7
Hypotheses testing in the random re-samplings.

Event window	H	Random-effects regression		Fixed-effects regression	
		Times_of_sig.	Proportion	Times_of_sig.	Proportion
11 days	H1	17	66.7%	17	66.7%
	H2	30	100%	30	100%
	H3	30	100%	30	100%
	H4	0	0%	0	0%
	H5	21	70%	20	66.7%
21 days	H1	27	90%	27	90%
	H2	30	100%	30	100%
	H3	30	100%	30	100%
	H4	11	36.7%	11	36.7%
	H5	30	100%	30	100%

Fig. 1 shows the coefficients and p values of the variables by using a random-effects regression and a two-way fixed-effects regression in the 11-day event window. With the robustness test on the 11-day event window, H2 and H3 are totally supported, H4 is totally unsupported, while H1 and H5 are supported approximately 70 per cent in all random re-samplings compared with the initial hypotheses test results of H2 and H3 being totally supported, H1 being approximately 90 per cent (5.5/6) supported, H4 being approximately 75 per cent (4.5/6) unsupported, and H5 being approximately 70 per cent (4/6) supported. The total support for H2 and H3, and the 70 per cent support for H1 in the robustness test of the 11-day event window indicate that the effect of computer-mediated investor attention on tourism firms' performance after restructuring is weaker than the effect of mobile-mediated investor attention, although the two 'types' of attention both have a significantly positive effect on restructuring performance. The influence of attention via a mobile device is dominant. The total lack of support for H4 in the robustness test on the 11-day event window indicates that the moderating effect of media coverage accessed via a computer on the relationship is very weak during this period. The 70 per cent support for H5 in the robustness test indicates that the moderating effect of media coverage accessed via a mobile device on the relationship is strong and not very stable at this time. Thus, the interval from 2 to 5 days after an announcement of asset restructuring by tourism firms is the window when investors function if they use a mobile device. In relation to both H4 and H5, the robustness test on the 11-day event window generally supports the hypothesis that media coverage negatively moderates the impact of investor attention on restructuring performance 2–5 days after the announcement of restructuring.

Fig. 2 shows the coefficients and p values of the variables by using a random-effects regression and a two-way fixed-effects regression in the 21-day event window. H2 and H3 are totally supported, as in the robustness test on the 11-day event window. H4 is approximately 40 per cent supported, which is stronger than in the robustness test on the 11-day event window; H1 and H5 are supported in at least 90 per cent of all random re-samplings, which is stronger than in the robustness test on the 11-day event window. During the 5–10 days after an announcement of a tourism firm's restructuring, individual attention has increasingly stronger effects. Media coverage accessed via computer begins to significantly positively moderate the effect of individual attention on tourism firms' performance after restructuring in the 21-day event window. H4 is supported more than 70 per cent if the significance level is loosened to $p < 0.1$. Thus, a positive moderating effect of media coverage accessed via computer on the relationship exists but is not strong, while there is a negative moderating effect of media coverage if it is accessed via a mobile device.

In addition to supporting the initial findings, these robustness tests generate the following supplements. Individual investor attention positively and increasingly correlates with tourism firms' performance after restructuring up to 10 days after the announcement of a restructuring. The attention of individual investors who use mobile devices functions first, followed by the attention of investors who use computers. In 5-day event window, the negative mediating effect of media coverage on the relationship begins to function if this coverage is accessed via a mobile device. In 10-day event window, a positive moderating effect of media coverage on the relationship begins to function if this coverage is accessed via a computer. Nonetheless, the negative moderating effect of media coverage accessed via a mobile device on the relationship is dominant.

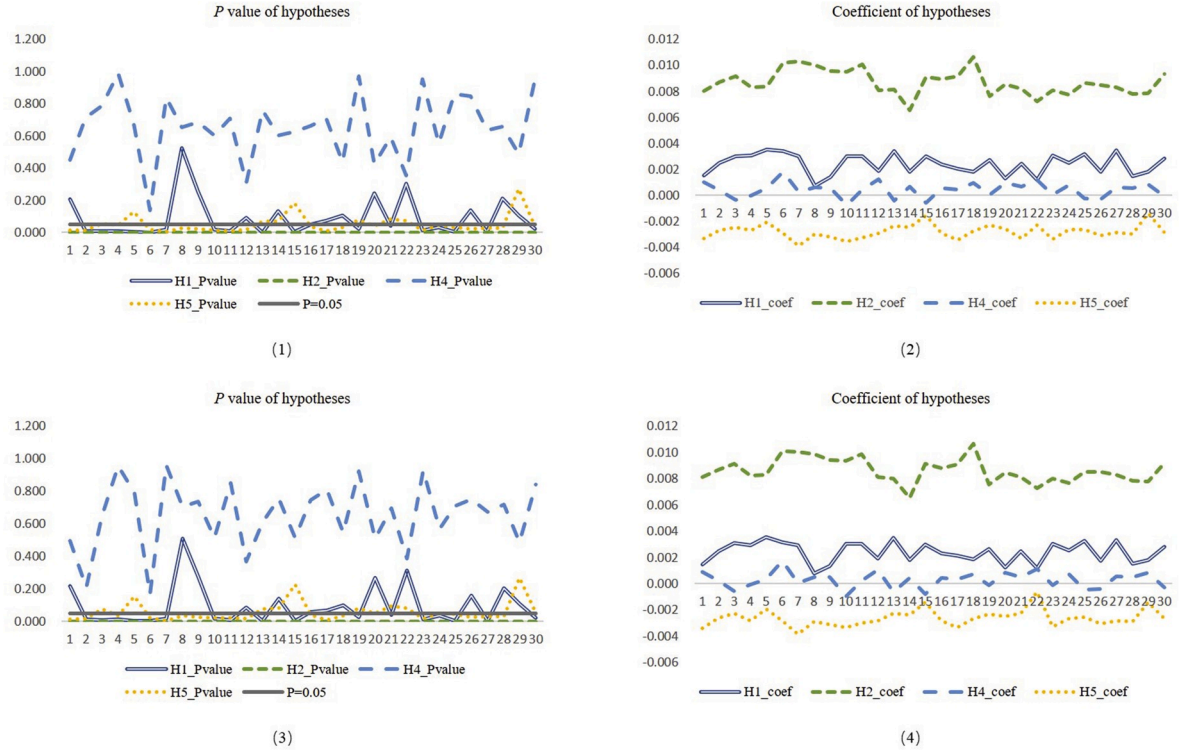

Fig. 1. Results of model 1 in the random re-samplings for the 11-day event window. Notes: Figures (1) and (2) refer to the p values and coefficients in the random re-samplings for the 11-day event window by using a random-effects regression; Figures (3) and (4) refer to the p values and coefficients in the random re-samplings for the 11-day event window by using a two-way fixed-effects regression.

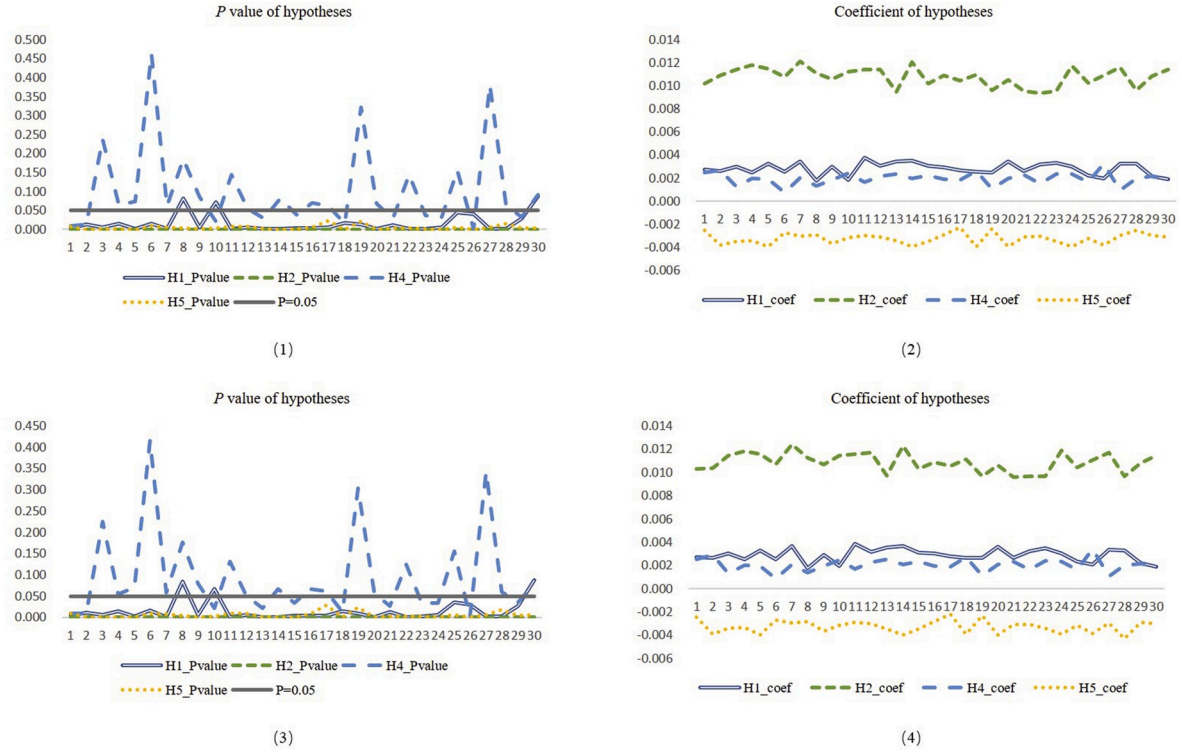

Fig. 2. Results of model 1 in the random re-samplings for the 21-day event window. Notes: Figures (1) and (2) refer to the p values and coefficients in the random re-samplings for the 21-day event window by using a random-effects regression; Figures (3) and (4) refer to the p values and coefficients in the random re-samplings for the 21-day event window by using a two-way fixed-effects regression.

6. Conclusion and implications

6.1. Theoretical contributions

Asset restructuring has been broadly used by tourism firms as a popular means for them to respond to threats and opportunities in the business environment. However, the determinants of tourism firms' performance after restructuring is still unclear, although some studies have focused on this research question (e.g., Lee, et al., 2014). This study takes a further step by adding robustness tests and by evidencing on how individual investor attention affects performance after the restructuring of public tourism firms and how media coverage moderates this relationship.

Our analyses yield four new results. 1) First, individual investor attention has a significantly positive effect on tourism firms' performance after restructuring. In the period following asset restructuring, when the restructuring event attracts more individual investor attention, the firm's performance will be better. Additionally, individual investor attention is identified as a new external factor of performance after restructuring, which is called the *investor-attention winner*. 2) Second, different forms of attention (i.e., whether attention is via a mobile device or a computer) have different effects. Compared with previous findings of the differences in the impact on returns of attention heterogeneity in relation to both timing and information sources, our findings indicate a new type of attention heterogeneity that relates to the search platform, namely, a computer or mobile device, and each has different advantages and corresponding users of different ages. Individual investor attention via a mobile device has more impact on tourism firms' restructuring performance than investor attention via a computer. We call this phenomenon *mobile-attention winner*. 3) Third, the moderating effect of media coverage on the relationship varies with time and with different means to access this media coverage. Although it is inconsistent with previous findings that demonstrate a negative moderating effect of media coverage on the relationship between investor attention and stock returns, we find that the moderating effect of media coverage on the relationship between individual investor attention and tourism firms' restructuring performance varies with time and media heterogeneity. The moderating effect of media coverage via a computer needs more time to function than the moderating effect of media coverage via a mobile device. The moderating effect of media coverage via a computer is positively correlated with the relationship between investor attention and restructuring performance, which is called the *computer-news winner*. The moderating effect of media coverage via a mobile device is negatively correlated with the relationship, which is called the *mobile-news loser*. 4) Finally, the effect of individual investor attention functions immediately, while time is needed for the moderating effect of media coverage to appear.

The above findings are essential to tourism management. 1) First, tourism management refers to management of tourists traveling to and staying in their unusual environment, management of firms serving tourists' traveling and staying in their unusual environment, and management of government departments planning tourists' unusual destinations. The research relates to the impact of individual investor attention on tourism firm restructuring belongs to the management of firms serving tourists' traveling and staying in their unusual environment through helping tourism managers aware external influences of firm restructuring. 2) Second, tourism is the emerging sector comparing with other sectors like manufacturing, finance, real estate, energy, and farming. The ownership structure of tourism firms in the newly developed industry is unique in terms of the large proportion of individual investors. Thus the impact of individual investor attention on restructuring is essential to tourism management. 3) Third, the managers of tourism firms employ restructuring to improve firm performance, which is classified as performance in accounting reports and performance in stock market. One of the most important work of tourism managers is to transfer tourist volume into earnings and accordingly improve firm owners' equity. The improved firm performance in stock market after tourism restructurings is helpful to build the firm brand with restructuring, as stock price describes the value of a tourism firm. Thus, our findings are helpful for tourism managers to maximize the firm value and brand. 4) Finally, the well-known definition of assets restructuring's performance includes the short-term performance in stock market and the long-term performance in accounting reports. Both of them have advantages and disadvantages. The focus of tourism managers on short-term restructuring performance is to reveal the success of restructuring, not the short-term market price. The calculative abnormal return indicates to what extent the success of tourism restructuring is supported by investors.

At the same time, this study has insightful theoretical implications within the tourism literature. It is one of the first studies to investigate the relationship between individual investor attention and the performance of tourism firms after restructuring. As noted before, a restructuring strategy is critical for tourism firms. Although some tourism studies have attempted to contribute to this topic, inconsistent findings have been obtained, mainly based on a single data source. This study combines three data sources to obtain the characteristics of tourism firms, firm returns on the stock market, and individual investor attention on tourism restructuring firms (taken from search engine data). In addition, we also introduce the event and time fixed effects in our model to alleviate the issue of omitting variables. Accordingly, the findings of this study should provide new insights for future studies regarding this topic.

Furthermore, the above findings for tourism firms also significantly contribute to the finance literature. Although some studies have identified the effect of individual investor attention on stock prices, to the best of our knowledge, this study is one of the few attempts to verify the power of individual investor attention on improved performance after restructuring. In addition to the main effect, we also attempt to discover the mechanism behind this main effect by focusing on the effect of different forms of attention and by further investigating the moderating effect of media coverage. Our findings will provide scholars a deeper understanding of the impact of individual investor attention on investor decisions and firm performance.

6.2. Practical implications

This study also has managerial implications for tourism managers. 1) First, according to our findings, tourism managers should pay attention to individual investors' reactions when implementing an asset restructuring. If more attention can be drawn to restructuring announcements, tourism managers can foresee performance improvement from the reorganization. Otherwise, tourism managers should consider why the restructuring might not draw individual investors' attention and why investors might not be optimistic about the restructuring. An aggregate search volume in search engines can help tourism managers monitor individual investor attention. Tourism managers need to carefully distinguish the different effects that attention will have at different times and when it operates via different platforms. Individual investor attention via a mobile device is more accurate than attention via a computer in foreseeing the possibility of performance improvement after restructuring. 2) Second, tourism managers should not overlook the negative moderating effect of media coverage on the relationship. In light of the findings regarding the time needed for the negative effect of media coverage to function, tourism managers should announce asset restructurings in as much detail as possible on platforms, which can only be accessed from mobile devices within 5 days, and keep a low profile afterwards. Otherwise, tourism firms' performance after restructuring will be weakened by the media exposure accessed via mobile devices. Tourism managers should also increase the volume of messages about restructuring, which can be accessed from a computer as soon as possible or at least within 10 days after the restructuring announcement, since computer media coverage can increase performance after

restructuring. 3) Finally, to achieve even greater performance improvement with tourism restructuring by considering our findings, tourism managers should establish an independent position to professionally handle individual investor attention, such as offering the position of Chief Attention Officer (CAO) to a senior director for the supervision of internet announcements on tourism firms' restructuring.

The findings of this study also present suggestions to investors in the tourism industry. 1) Our study suggests that there is a signal of tourism firms' performance after restructuring through individual investor attention. Tourism investors should consider individual investor attention when trading tourism firms' stocks. If the level of individual investor attention via either a computer or mobile device is increased significantly after a restructuring announcement, tourism investors should trade in tourism firms' stocks, as a cumulative abnormal return will be generated. Otherwise, tourism investors should wait and see the consequences of the restructuring. 2) Furthermore, media coverage is a factor that should be considered when trading stocks in restructured tourism firms. Generally, more mobile media exposure after 5 days of a restructuring announcement means less cumulative abnormal return from restructured tourism firms. Tourism investors should focus more on restructured tourism firms with less mobile media coverage to achieve more profit. Otherwise, tourism investors should pay more attention to restructured tourism firms that receive more computer-mediated exposure. 3) Finally, the time points of 5 and 10 days after a tourism firms' restructuring announcement should be followed with interest. If mobile media coverage does not improve significantly within 5 days of the restructuring announcement and computer media coverage improves significantly within 10 days of the restructuring announcement, tourism firms' stocks will see appreciable returns and should be held for a relatively long time.

6.3. Limitations and future directions

The limitations and future research directions are as follows. 1) First, we focus on the effect of individual investor attention on tourism firms' short-term performance after restructuring, which leaves the relationship between attention and long-term performance for further investigation. Future researches can further focus on long-term performance of tourism restructuring revealed in firms' accounting reports. 2) Second, the findings are limited to the Chinese tourism market, which leaves future research to generalize them to developed countries. 3) Third, asset restructuring can help tourism firms avoid bankruptcy and recover from distress; as a result, further research can investigate the effect of investor attention on tourism firms' failure prediction. 4) Fourth, because the necessary data were not available for the present study, the payment method, acquisition premiums and financial constraints were not controlled, and, therefore, these areas need to be further explored. 5) Finally, as the data used in this study is firm-level and the main research target is tourism firm, we cannot provide much more implications to management of individual like tourist or tourism product. Future researches can focus on tourist-level or product-level impact of restructuring performance of tourism firms.

Author contribution

Hui Li is the first author of this paper. He devised the original idea, applied for research funding, and completed the following research tasks: theoretical development; results analysis; discussion of implications and study significance; and improvement of the original draft. Ya-Fei Liu is the second author and corresponding author of this paper; she contributed via the experimental design, algorithm design and coding, data collection, results report, and finished the original draft. Sai Liang is the third author of this paper. He contributed by discussing the original idea, improving the Conceptualization and presentation of the hypotheses and Formal analysis. Qing Zhou is the fourth author of this paper and provided conceptual development and refinement, and also helped in funding application.

Declaration of competing interest

None.

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