Economic Modelling xxx (xxxx) xxx

Contents lists available at ScienceDirect

Economic Modelling

journal homepage: www.journals.elsevier.com/economic-modelling

Does investor relations matter in the tourism industry? Evidence from public opinions in China☆

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ARTICLE INFO

Keywords:
Investor relations
Market reaction
Public opinions
Tourism industry
Event study

ABSTRACT

This study uses public opinions on tourism in China in 2010–2017 as exogenous shocks to analyze how the capital market responds to public opinions on tourism events, and how the investor relations (IR) of listed firms affects investor responses in the tourism industry. We find that firms located in provinces where public opinions broke out experience significant decreases in cumulated abnormal returns, thereby indicating investors' pessimistic reaction on negative events in the local tourism industry. Furthermore, firms' IR facilitates the alleviation of market fluctuations, and this effect is more pronounced in private firms and firms spending less on advertising. This study offers important policy implications. First, the government and supervisors should formulate policies and provide feasible plans to improve investor relations. Second, firms could reduce unfavorable fluctuations of stock prices by strengthening their investor relations.

1. Introduction

In recent years, China has undergone substantial market/institution development and reforms, thereby leaving considerable room to learn capital market functions and information dissemination in theory and practice (Kong and Xin, 2019). With the specialization, professionalization, and globalization of capital markets, investors have become more and more systematic and powerful in their capital allocation. In particular, they are more active in questioning the business strategies and stewardship of firms, engaging in firm management, or merely voting with feet. Accordingly, stockholders have become important stakeholders because of the legal substance of their investments and strategic significance of capital access. Managers even cater to investors and manage earnings to avoid investor selling and mis-valuation of firms' stock prices (Kong, 2019).

Investor relations (IR) activities have emerged to enable firms manage capital market relations (Hoffmann et al., 2018). The National Investor Relations Institute Board of Directors (2003) proposes that IR is a strategic management function integrating finance, communication, marketing, and securities law compliance. The objectives of IR include ensuring effective communication and interaction among companies, financial participants, and infomediary, and facilitating the fair valuation of stocks. However, the related studies have disagreed on the effectiveness of IR.

On the one hand, traditional finance theory denies the existence of the IR effect, and holds the view that merely integrating and communicating an existing information set for the capital market should not generate extra returns (Agarwal et al., 2016). This view is based on efficiency assumptions, which advocates that information has been incorporated into the price.

On the other hand, some studies have confirmed the effectiveness of IR, although these studies are nearly from the empirical research. These studies have documented that IR effort is positively related to capital market visibility, liquidity, and returns; such a relationship could be

☆ Mingli Xu gratefully acknowledges the financial support from Humanities and Social Science Foundation of Ministry of Education of China (Grant no. 19YJC790159), National Natural Science Foundation of China (Grant no. 71802085), and Guangdong Higher Education Project for Young Innovative Talents (Grant no. 2018WQNCX015), Zhixiong Huang gratefully acknowledges the financial support from Zhejiang Natural Science Fund (Grant no. LQ20G020015) and Zhejiang Social Science Fund (Grant no. 20NDQN305YB).

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https://doi.org/10.1016/j.econmod.2020.02.033
Received 1 December 2019; Received in revised form 16 February 2020; Accepted 17 February 2020
Available online xxxx

explained by the reduction of information asymmetry and risk, and promotion of trust from financial participants and infomediary (Hoffmann et al., 2018).

The risk estimates of retail investors are susceptible to firms' reputation and trust (Tong, 2015), while IR, one form of corporate disclosure, promotes transparency in terms of financial soundness of firms, and could foster trust in the long run (Merton, 1987). Accordingly, IR would influence the stock market reaction if the market responds to incidents that infringe on tourists' interests and destroy trust (i.e., if the stock market is efficient and information is reflected in the price).

The market efficiency of China's stock markets has been well investigated in the literature, such as those involving test of random walk and price reaction to the announcement of public information (Ma, 2004). Barnes and Ma (2004) investigate the stock price responses to bonus issues and find that the hypothesis of semi-strong market efficiency is satisfied in the B-share market but rejected partially in the A-share market; while Laurence et al. (1997) and Lima and Tabak (2004) confirm that the A-share market is weak form efficient. Liu et al. (1997), Lim et al. (2009), and Long et al. (1999) find that the A- and B-share markets in China are weak form efficient because the stock returns follow a random walk.

Despite the disagreements on the efficiency of China's A-share markets in the 20th century, Luo et al. (2015) demonstrate that the split-share structure reform that started in 2005 has improved market efficiency, and a number of studies conducted thereafter have confirmed that the Chinese stock market is weak form efficient. For example, Lim et al. (2013) investigate the efficiency of the A- and B-share markets in China from 2006 to 2010 and show that these markets are weak form efficiency. Mobarek and Fiorante (2014) examine the BRIC (Brazil, Russia, India and China) equity markets from September 1995 to March 2010 and find a trend toward increased weak form efficiency, and also support the belief that Chinese stock markets are fairly weak form efficient in 2006–2010.

Accordingly, we assume that the Chinese stock markets in recent years have satisfied the Efficient Market Hypothesis, and then focus on the market response to the public opinions, which reflect public attitudes toward negative events in the tourism industry that infringe on the rights or interests of tourists. Our most important reason for selecting the tourism sector is that the majority of investors are consumers of tourism services. Thus, investor relations play a vital role in this sector. Besides, chaos and confusion prevail in the Chinese tourism industry, such as treating and overcharging the tourists, coerced shopping, overcrowded scenic spots, and tourist injuries.[1] The convenience brought about by the Internet facilitates the spread of information and formation of public opinions. Consequently, numerous unexpected events have occurred in the tourism sector and attracted widespread public attention, thereby enabling us to detect the abnormal returns of the firms and provinces involved. Moreover, the development of the tourism sector has been taken seriously by the government. In the National People's Congress and the Chinese People's Political Consultative Conference (NPC & CPPCC) in 2016, China's former Premier Li Keqiang emphasized in the government work report that orderliness in the tourism sector should be normalized to adapt to the emerging era of mass tourism.

Under this setting, we measure the market reaction to public-opinion-related events and investigate the effects of IR. Information related to public opinions on the tourism sector is collected from the Internet, and the IR data are collected from the official interaction websites established by Shenzhen Stock Exchange and Shanghai Stock Exchange. We use the data of answers to retail investors' questions to measure IR. Given that the interaction websites had minimal disclosures until 2010, the sample period of our study is 2010–2017. After excluding the provinces that have no listed firms and firms engaged in noise trading or with missing data, our sample includes 40 province-event level observations and 80 firm-event level observations, which are distributed unevenly in 11 provinces.

First, we calculate the cumulated abnormal returns (CARs) of listed firms located in the provinces involved in public-opinion-related events and province-event level cumulated average abnormal returns (CAARs). We test if CAARs reject the zero hypothesis and find that CAARs are significantly negative (nearly −3.16% in an 11-day holding period around the related events). Our results indicate that negative events involving the infringement of tourists' legitimate rights and interests decrease the market returns of firms registered in the relevant provinces, and support the Efficient Market Hypothesis of China's stock market.

Second, we examine the effects of IR on the stock market response to the negative public-opinion-related events. The results show that firms with stronger investor relations before the relevant events experience a slighter decrease in stock price (negative CAR), suggesting the positive moderating role of IR in investors' reaction to the infringement of tourists' rights and interests.

Lastly, we explore the possible mechanisms of how IR affect investors' reaction. By dividing CAR into pre- and post-events, we find that the influence of IR on CAR is only significant in the post-event period. This result indicates that IR positively impacts investors' behaviors only after public rights and interests are violated. We further examine the moderating role of state ownership. We conclude that IR is more effective in private firms, which may be caused by the inherent trust and resource superiority of state-owned enterprises (SOEs) over private firms. Moreover, we investigate the impact of advertising expenditures, and find a substitute relationship between IR and advertising expenditures.

Our study contributes to the investor relations research in emerging markets. To date, the majority of the studies on investor relations have been conducted in Western markets, such as the United States (e.g., Agarwal et al., 2016), the United Kingdom (e.g., Craven and Marston, 1997), and Germany (e.g., Appelhoff et al., 2016), as well as in developed countries in Asia, such as Japan (e.g., Ly, 2010) and South Korea (e.g., Kim et al., 2009). However, research on IR practice in developing countries, such as China, is limited.

We also contribute to the literature by supplementing the IR research from the perspective of retail investors. The majority of the prior studies on investor relations have focused on the effects of IR activities on information intermediaries (e.g., analysts, the media, and institutional investors), and little research regards retail investors as an IR audience (Hoffmann et al., 2018). Evidently, IR may impact retail investors' risk perception and transaction activities. The current research enriches the stream of literature by investigating the influence of IR between listed firms and retail investors on stock market reaction to public-opinion-related events in the tourism sector.

Lastly, this study provides a critical insight for regulators and tourism firms to strive for the enhancement of investor relations, which would ultimately stabilize the stock market and protect investors, particularly for sectors that are susceptible to the market environment and industry scandals.

2. Literature review and hypothesis development

2.1. Literature review

Firms invest considerable resources in undertaking IR activities, including money and time (Hong and Huang, 2005). The positive effects of IR have been demonstrated in literature both theoretically and empirically. Due to limited investor familiarity with firms, incomplete information and short-selling restrictions (Merton, 1987; Trueman, 1996), theories argue that IR could improve stock price of listed firms by correcting mis-valuations (Verrecchia, 1983, 1990), increasing firms' investment efficiency (Fishman and Hagerty, 1989), reducing

[1] Some tourism scandals were reported on international websites: http://www.chinadaily.com.cn/hkedition/2010–06/04/content_9932190.htm; https://observers.france24.com/en/20150507-chinese-tour-guide-souvenirs-video.

information asymmetry and cost of capital (Diamond and Verrecchia, 1991).

Most empirical evidences of IR's effects come from the capital markets. Some examine the direct effects of IR on stock market return (e.g., Frankel et al., 2010; Peasnell et al., 2011; Vlittis and Charitou, 2012; Agarwal et al., 2016). The others investigate the indirect effects of IR on stock market performance from different perspectives, including stock visibility and liquidity (Bushee and Miller, 2012; Vlittis; Charitou, 2012; Kirk and Vincent, 2014; Agarwal et al., 2016), information asymmetry (Chang et al., 2008; Vlittis; Charitou, 2012), disclosure quality (Kirk and Vincent, 2014; Ferguson and Scott, 2016), analyst and media coverage (Chang et al., 2008; Bushee and Miller, 2012; Kirk and Vincent, 2014; Agarwal et al., 2016), cost of capital (Ly, 2010) and so on.

To our knowledge, there is little academic research investigating the IR of Chinese firms (which refer to the firms in mainland China unless particularly specified). Xiao et al. (2004) analyze the determinants behind Chinese listed firms' voluntary internet-based disclosure, in which 4 of the 84 disclosure items are related to IR and their sample covers 300 largest firms in 2001. Feng and Wan (2013) compare the website-based IR in developed and developing economics (the US, UK, Hong Kong and mainland China), in which IR information of 30 firms on China CNINFO40 are collected. Some studies published in Chinese journals also use survey data. For example, Li et al. (2007) and Quan et al. (2016) are based on comprehensive survey conducted by Nanjing University and China Securities Regulatory Commission in 2004–2007 and 2009. Lin et al. (2005) and Xin et al. (2006) use the survey data of IR management practice of listed firms in Shenzhen Stock Exchange during October 1st to December 31st, 2004.

Although there's no research focusing on IR and firm performance in the field of tourism, previous research has investigated the impact of corporate social responsibility (CSR) on firm performance of tourism sector. The CSR involves communication to all the stakeholders while IR is to stockholders, especially individual investors. For example, Park and Lee (2009) and Kim and Lee (2020) examines the effect of CSR on restaurant firm performance. Regarding CSR as a single composite factor, Park and Lee (2009) find no significant impact on total shareholder return; however, after dividing CSR into material and immaterial sustainability activity, Kim and Lee (2020) find that immaterial CSR positively affect firm performance as its level of franchising increases. Lee et al. (2013) also examine how CSR influences firm performance in the airline industry, which is closely related to tourism sector.

As to the measures of IR, early studies employ the Association of Investment Management Research Corporate Information Committee (AIMR) firm disclosure quality ratings, such as Lang and Lundholm (1996), Healy et al. (1999), Bushee and NOE (2000) and Jiao (2011). Chang et al. (2008) measure firms' IR activity using internet-based disclosure. Bushee and Miller (2012) use firms' hiring of external IR agencies, while Kirk and Vincent (2014) employ firm investments in internal IR departments. Vlittis and Charitou (2012) use IR announcement, either the appointment of a new IR officer or the hiring of an IR firm. Most Chinese studies on IR are based on survey before 2010, with a small scale or/and in a specific period.

2.2. Hypothesis development

In this paper, we employ the event-study approach to evaluate the market responses to public-opinion-related events in tourism sector. By estimating the cumulated abnormal returns around the event days, this approach allows us to measure the influence of relevant events on stock market value of firms located in the relevant provinces. According to Fama (1970)'s Efficient Market Hypothesis, in a weak form efficient market, stock prices have fully captured historical information, in a semi-strong form efficient market, all public information has been incorporated into stock prices, and in a strong form stock market, even the use of inside information would not result in abnormal high returns.

Based on the assumption of weak form efficiency of China's stock market, we expect that the stock prices change immediately after the exposure of bad news which attracts extensive attention. Following Brown and Warner (1985) and Mackinlay (1997), we use the stock price change over a relatively short period (cumulated abnormal return) to measure the economic impact of events on stock market. Since tourism activity depends largely on the presence and quality of local natural and cultural characteristics, and tourism attractiveness has a strong impact on total local tourism consumption (Faber and Gaubert, 2019), we propose the following hypothesis:

Hypothesis 1. The firms located in the public-opinion-related provinces experience significant negative abnormal returns after the events.

Since tourists are usually unfamiliar with the cities/provinces/countries where they are going to visit, it is common to hear the news reporting that tourism firms conduct misleading propaganda or deceive to attract more tourists, and that tour guides take the liberty of changing tour schedules and coax tourists to consume at scenic spots. Lack of transparency in tourism services is particularly severe. With the convenience of information era, more and more tourists have easy access to the tourism information and tourism services on the Internet, including the scenic pots, travel agencies or individual tour guides, restaurants and hotels. Bad news about the relevant tourism service suppliers is likely to provoke public discontent and decrease the number of tourists at the relevant places, thus public opinions on tourism would significantly affect the performance of firms located there.

The IR, on one hand, could facilitate trust in financial communication, which is defined as organizational trust that enables the acting of risk-taking behaviors between a firm and its stakeholders by Tong (2015); on the other hand, IR reduces information asymmetry and helps stakeholders value the firm positively and fairly (Chang et al., 2008; Kim et al., 2009; Laskin, 2011; Vlittis; Charitou, 2012). Accordingly, we expect that efforts in IR partially immunize firms in tourism industry against stock price decrease when negative natural shocks occur or anything else related to infringement on the rights and interests of tourists.

Hypothesis 2. IR efforts of firms before the public-opinion-related events significantly reduce the cumulative abnormal returns around the events.

3. Data and methodology

3.1. Data

Our sample consists of all the firms in tourism industry listed on China's A-share market.[2] We collect the public opinion events related to tourism over the year 2010–2017 from the Internet. The transaction, financial and ownership data are from China Stock Market and Accounting Research (CSMAR) database, one of the most famous and frequently used databases in research on Chinese listed firms, including data of daily return, market return, total assets, operating costs, book-to-marker ratio and controlling shareholders. The information of advertising expenditures is from iFind, a financial data terminal in China. We match the firms with the related events on provincial level. We drop the observations that may cause noise if such events as merge & acquisition announcement, dividend policy announcement, long-time trading suspension, pledge release of shares, performance disclosure, special treatment (ST) and Particular Transfer (PT) occurred during the tourism-opinion-related event window. we also drop 1 observation that had no information of total assets in the end of last fiscal year. After this clearing process, we obtain 80 firm-event observations, including 40 provincial level tourism-opinion-related-events.[3] Table B1 reports the detailed list.

[2] The B-share market only contains two tourism firms, which are also listed in A-share market.

[3] Details about the events are tabulated in Table B1 of Appendix B.

The data of investor relations are from the interaction platforms established by the Shenzhen Stock Exchange (Easy Interaction, "互动易" in Chinese) and Shanghai Stock Exchange (e-Interaction, "e互动" in Chinese).[4] These two websites are aimed at promoting information communication between listed firms, investors and other market participants, and building centralized, convenient and timely interactive channels to protect the legal rights of investors, especially minority investors. Shenzhen Stock Exchange began to operate Easy Interaction on December 25th, 2009 and upgraded the system on August 21st, 2013. And the e-Interaction of Shanghai Stock Exchange went into service after July 5th, 2013. On these two internet platforms, the public could scan and search information of all the listed firms conveniently. More importantly, the platforms provide the access to suggestions and problems on firm operation and development, and disclose the responding answers and feedback from firms, online interview participation and information about survey by institutional investors and media interview, and so on.

Inspired by Chang et al. (2008) who measure IR activity using internet-based disclosure, we try to gauge IR of listed firms through the disclosure on these two official interaction platforms built by Shenzhen Stock Exchange and Shanghai Stock Exchange. This is also in accordance with some IR research based on survey on information sharing, communication and investor support, (e.g., Xiao et al., 2004; Lin et al., 2005; Li et al., 2007; Quan et al., 2016).

Specifically, we use the number of questions answered by each firm during its corresponding estimation window (*QA*) as the proxy of IR, to capture the efforts in IR before public-opinion-related events occur. The information of the questions and answers is manually collected from the two interaction platforms. In the regressions, we take *QAdummy* (A dummy variable which takes 0 if *QA* equals 0 and 1 if not) and *LnQA* (The logarithm of *QA* plus 1) as measures of IR.

3.2. Methodology

We use the event study methodology to examine how investors respond to the public-opinion-related events in tourism industry. This methodology has been widely used in the research of economics, finance and accounting ever since it was first introduced by Fama et al. (1969), and has become the standard method of measuring stock price reaction to events such as mergers and acquisitions, earnings announcements, accounting rule changes and macroeconomic news announcements (MacKinlay, 1997; Binder, 1998). In recent years, event study still prevails in the research investigating the market responses to firm-specific (e.g., Zhang et al., 2016; Bizjak et al., 2019), sectoral (e.g., Kong, 2012; Pozo and Schroeder, 2016; Kong et al., 2019), and regional events (Reid and Carcello, 2017; Pham et al., 2018; Wagner et al., 2018; Shahzad et al., 2019).

Based on the pioneering study of Fama et al. (1969), modifications and adjustments has been developed to deal with complications arising from violations of statistical assumptions and accommodation of specific hypotheses, in which Brown and Warner (1985) details the implementation for daily data. Following Brown and Warner (1985), we conduct the event study as follows.

The event day (T_0) is specified as the day on which a tourism-related event happened in the province where a listed firm is registered. If that was a Saturday, Sunday or other non-trading day, it would be postponed to the next trading day. The *event window* is the period over which we observe the stock price reaction to related events. In consistent with most research employing event study, we define an 11-day *event window* as [T_0-5, $T_0 + 5$]. And the period of 155 trading days prior to the *event window* is used as the *estimation window*.[5]

We calculate the *cumulative abnormal return* (*CAR*) for each firm in our sample across event windows and further the *cumulative average abnormal return* (*CAAR*) for each province across event windows. These two variables capture the overall financial market responses to related events on firm and provincial level, respectively. *CAAR* would be used to test Hypotheses 1 and *CAR* to verify Hypotheses 2 and conduct additional tests. Specifically, the *cumulated abnormal return* (*CAR*) for firm *i* in province *j* over the window [T_S, T_E] is:

$$CAR_i = \sum_{t=T_S}^{T_E} AR_{i,t} \tag{1}$$

where T_S denotes the starting of a window and T_E the ending day. Besides the event window [T_0-5, $T_0 + 5$], we also calculate *CAR* over the pre-event window [T_0-5, T_0-1] and the post-event window [$T_0 + 1$, $T_0 + 5$]. $AR_{i,t}$ is the abnormal return for firm *i* at trading day *t*. The detailed procedures to derive $AR_{i,t}$ are presented in Appendix A.

Since the tourism-related events are provincial level, we then calculate the cumulated average abnormal return (*CAAR*) for province *j*:

$$CAAR_j = \frac{1}{N_j} \sum_{n=1}^{N_j} CAR_i \tag{2}$$

where N_j is the number of listed firms located in province *j*.

To further investigate the effect of *IR* on *CAR*, we follow Dimson and Marsh (1986), Fama and French (1992) and Fama and French (1993) to control the size effect and book-to-market effect.

$$CAR_i = \alpha + \beta_1 IR_i + \beta_2 Ln(Size)_i + \beta_3 Ln(M/B)_i + \varepsilon_i \tag{3}$$

The coefficient of IR_i β_1, is of interest. We expect it to be positive and significant.

To compare the effect of *IR* on *CAR* before and after the event day, we further measure CAR_i as cumulated abnormal return over the pre-event window and pre-event window, CAR_i^{pre} and CAR_i^{post}, respectively. We expect that IR_i has no effect on CAR_i^{pre} but significantly promotes CAR_i^{post}. The definitions of variables are reported in Table 1.

4. Empirical analysis and results

4.1. Summary statistics

Before the empirical tests, we present the summary statistics of key

Table 1
Variable definition.

Variables	Definitions
CAAR	The cumulative average abnormal return of the public-opinion-related events on the province-event level.
CAR	The cumulative abnormal return of the public-opinion-related events on the firm-event level.
QA	The number of firms' answers to investors' questions on Easy Interaction or e-Interaction during the estimation windows.
QAdummy	A dummy variable indicates whether a firm answered investors' questions during the estimation windows, which takes 1 if so and 0 if not.
LnQA	The logarithm of the number of firms' answers during the estimation windows plus 1.
Ln(Size)	The logarithm of assets of firms in the end of last year before the related events.
Ln(M/B)	The logarithm of market to book ratio in the end of last year before the related events.
SOE	A dummy variable indicates whether a firm is controlled by the Chinese central government or local governments, which takes 1 if so and 0 otherwise.
Advratio	The ratio of advertising expenditures (disclosed in notes to financial statements) to operating costs in the end of last year before the related events.

Notes: *QA* is the proxy of *IR*, *QAdummy* and *LnQA* are the specific measures.

[4] For details, please refer to http://irm.cninfo.com.cn/ircs/index (Easy Interaction) and http://sns.sseinfo.com/(e-Interaction).

[5] For robustness, we also use 15-day and 21-day event windows, and the 155-day estimation windows are changed accordingly. Unless other specified, the default CAR_i is cumulative abnormal return over the window [T_0-5, $T_0 + 5$].

Table 2
Summary statistics.

Variables	Obs.	Mean	Std. Dev.	Min	Max
CAAR	40	−0.0316	0.0508	−0.1835	0.0624
$CAR_{[-5,+5]}$	80	−0.0388	0.0654	−0.2662	0.0963
$CAR_{[-7,+7]}$	80	−0.0477	0.0690	−0.2571	0.0977
$CAR_{[-10,+10]}$	80	−0.0350	0.0901	−0.2994	0.1763
$CAR^{Pre}_{[-5,-1]}$	80	−0.0073	0.0391	−0.1208	0.0931
$CAR^{Post}_{[+1,+5]}$	80	−0.0213	0.0407	−0.1386	0.0552
QA	80	75.6750	88.4548	0	514
QAdummy	80	0.7875	0.4117	0	1
LnQA	80	3.1979	1.9987	0	6.2442
Ln(Size)	80	22.4532	0.7898	21.0720	24.8462
Ln(M/B)	80	0.9430	0.5537	0.1670	3.9261
SOE	80	0.7875	0.4117	0	1
Advratio	64	0.1631	0.1887	0.0057	0.8120

Notes: This table reports the descriptive statistics of each variable based on the sample of A shares in the tourism industry in China.

variables in Table 2. There are 40 province-event observations, the average *CAAR* (over the *event window* of $[T_0\text{-}5, T_0 + 5]$) is −3.16%, with a t-ratio of 3.93, indicating significant decreases around the events in stock price of firms located in the provinces involved.[6] On average, there are two listed firms in tourism industry in each involved province-event. We obtain 80 firm-event observation distributed in 11 provinces, in which the densest province is Beijing where 6 tourism listed firms locates, and in Anhui, Guangxi, Hainan, Hubei, Sichuan, Zhejiang, only 1 tourism listed firm, respectively. The average $CAR_{[-5,+5]}$, which is the cumulative abnormal return over *event window* $[T_0\text{-}5, T_0 + 5]$ on the firm-event level, is −3.88%. The average $CAR^{Pre}_{[-5,-1]}$, which is the corresponding pre-window cumulative abnormal return, is 0.73%, the average post-window cumulative abnormal return, $CAR^{Post}_{[+1,+5]}$, is −2.13%. On average, each firm has answered 75 questions on the interaction platforms during its estimation window, with 17 observations have no question and answer records. Of the 80 firm-event observations, 63 of them are state-owned enterprises (SOEs). On average, the advertising expense accounts for 16.31% of the operating costs.

4.2. The market reaction to the tourism-related public opinions

To confirm the negative investors' responses on negative public opinions related to tourism, we adopt the event study methodology to plot the average *CAAR* for province involved by the average *CAR* of listed firms located there around the corresponding event dates in Fig. 1. It shows the market reaction to tourism-related public opinions in the *event window* $[T_0\text{-}5, T_0 + 5]$ on the provincial level. Both the average *CAAR* and its t-ratio have a significant downward trend during the event window. Thus, the graph strongly suggests that firms in provinces involved in the public opinions, on average, lose market value significantly around the event date. The decrease in stock price confirms the negative market reaction to the negative tourism-related public opinions. If we buy a stock of a firm which is registered in the province involved in tourism-related public opinion before the event (e.g., at the end of T_0-6) and sell it after the event (e.g., at the end of T_0+5), we would loss 3.16% in this investment during the 11 days holding period around the event on average.

As to the t-ratio, it is not significant until the public opinions broke out (with a p-value of 1.89% and a t-ratio of 2.45 on T_0). Both the absolute average value and the significance of *CAAR* increases as time goes by, which captures the negative impact of bad influential tourism events on firms' stock market performance and verifies Hypothesis 1. Since our sample firms are not the firms who fired those events, our results indicate that market performance of the tourism industry relies much on the local environment, including natural, social and cultural environment, which is consistent with Faber and Gaubert (2019).

4.3. The effect of investor relations

In this subsection, we examine the effect of investor relations on the market reaction to the tourism-related public opinions. We estimate Eq. (3) and report the results in Table 3. For comparison, the results without controlling size effect or book-to-market effect are also reported. Overall, the coefficients of *IR*, no matter measured by *QAdummy* or *LnQA*, are significantly positive, suggesting reject of the null hypothesis that independent variables cannot explain the dependent variable. Accordingly, *IR* has a significant positive effect on *CAR* over the event window $[T_0\text{-}5, T_0 + 5]$, indicating that investor relations does affect investors' reaction in stock market. Controlling the size effect and book-to-market ratio effect, the *CAR* of firms had records of answering investors' questions is about 4.8% (the absolute value) higher than *CAR* of those had no answering record, and 1% increase in the number of firm's answers would promote the *CAR* by 0.9% (the absolute value). Table 2 shows that the mean and the standard deviation of *CAR* is −3.88% and 6.54%, respectively, compared with which we could conclude that the impact of *IR* on *CAR* is also significant in economic sense.[7]

Jointly, these results support Hypothesis 2, indicating that firm with higher level of *IR* could alleviate the information asymmetry and help to strengthen investors' confidence. Investors would worry the operating performance of the listed firms in the province where some bad events arousing wide attention by the public occur. As to firms with stronger investor relations, investors know more about the firm strategy and development plan and thus have stronger faith in firm performance. These results are consistent with Moussa et al. (2017), who demonstrates that the impact of public information on stock return is conditioned by two elements: the company and market news disclosure, and the market participants' news interpretations and their risk aversion. To some extent, IR plays a role of facilitating information disclosure and reducing risk perception or aversion.

4.4. Robustness check

For robustness, we also employ two other event windows, $[T_0\text{-}7, T_0 + 7]$ and $[T_0\text{-}10, T_0 + 10]$. We calculate the cumulated abnormal returns in the period of $[T_0\text{-}7, T_0 + 7]$ and $[T_0\text{-}10, T_0 + 10]$, respectively. Then we take both $CAR_{[-7,+7]}$ and $CAR_{[-10,+10]}$ as dependent variables to check the robustness of IR's effects on different CARs. The results are presented in Table 4. It shows that the coefficients of *QAdummy* and *LnQA* are almost consistent with those in Table 3.

4.5. Additional tests

In this subsection, we try to clear the mechanism how investor relations affect investors' responses. Inspired by Kong (2012), Pozo and Schroeder (2016) and Kong et al. (2019) conducted in the food industry, which confirm the effects of corporate social responsibility (CSR), recall size and media coverage, we examine how IR works: (1) we split the effect of IR in different period, pre- and post-event; (2) considering the difference in financial support and trust between SOEs and private firms, we examine the effect of state ownership; (3) Due to the similar function in information disclosure of advertising and IR efforts, we examine the moderating effect of advertising expense.

First, we split the cumulated abnormal return into pre- and post-event to investigate whether the effect of investor relations on investors'

[6] It is worth to note that, there is one province-event observation which involved two different events occurred on the same day. On October 6th, 2013, there were two piece of tourism events in Guangxi province. Details are presented in Table B1 of Appendix B. The results are roughly the same if we drop this observation, with the average *CAAR* of −3.02% and the t-ratio of 3.72.

[7] Results are consistent if we drop the 4 observations that experienced suspension of trading more than 6 months.

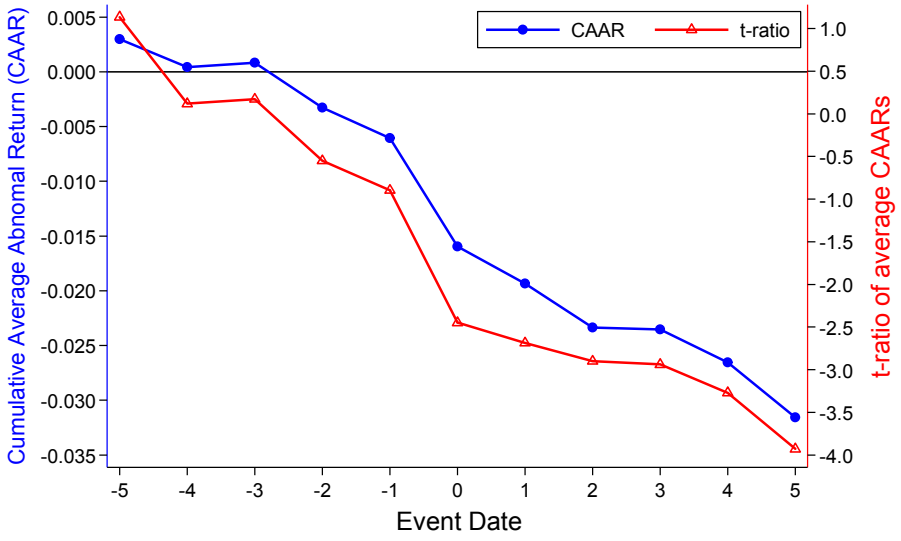

Fig. 1. The market reaction to the tourism-related public opinions in the event window.

Table 3
Regression of CAR on IR in the tourism industry.

	(1)	(2)	(3)	(4)
	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$
QAdummy	0.049**	0.048**		
	(2.25)	(2.28)		
LnQA			0.009**	0.009**
			(2.34)	(2.33)
Ln(Size)		−0.003		−0.000
		(-0.36)		(-0.02)
Ln(M/B)		−0.017		−0.017
		(-1.44)		(-1.37)
Cons	−0.077***	0.007	−0.069***	−0.049
	(-3.76)	(0.04)	(-4.04)	(-0.25)
Obs	80	80	80	80
R^2	0.095	0.117	0.084	0.104

Notes: This table reports the regression results of cumulated abnormal returns on investor relations, which are estimated by Eq. (3). $CAR_{[-5,+5]}$ is cumulated abnormal return calculated by an 11-day event window. Definitions of variables are listed in Table 1. T-statistics adjusted by robust standard errors are displayed in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

responses is different before and after relevant incidents. Tourism-related public opinions refer to incidents happened without prediction and then quickly attract widespread attention, or phenomena even appear before but have not been widely noticed before. Accordingly, it is more likely that the influence is manifested after public opinions arise. That is, the positive impact of *IR* on *CAR* would be significant only after public opinions break out. We then regress the *CAR* in pre- and post-event windows respectively to verify this conjecture. The results are reported in Table 5. It shows that the effect of *IR* on *CAR* is only significant after event date.

Second, we consider the moderating effect of state ownership. Ownership structure could influence firm performance of tourism firms significantly (Al-Najjar, 2015). A typical characteristic of Chinese transitional economy is the difference induced by state capital and private capital. According to a report from 21st Century Business Herald in September 19th, 2019, private capital accounts for more than 60% of the 1.5 trillion RMB direct investment in tourism sector, indicating that private firms have become the main part of this sector. However, private tourism firms still face difficulties in financing and other problems such as poor tourism projects and repeated exploitation and construction.[8] As a result, lack of confidence in private tourism firms may be reasonable. We then compare the effect of *IR* in SOEs with that in private firms (NonSOEs). Specifically, we add the dummy variable *SOE* and the interaction item *IR*SOE* to the right-hand side of Eq. (3). The results are reported in Table 6.

From Table 6, we see that the coefficients of the interaction items are all negative, and are significant when we use *QAdummy* (A dummy variable indicates whether a firm answered investors' questions during the estimation windows, which takes 1 if so and 0 if not) to measure *IR*. It verifies the significance of the adoption of online Q&A mechanism in IR management. Whether or not answering investors' questions on the interaction platforms is far more important for private firms than SOEs who may have policy privilege and resource superiority of more stable customers, capital sources and security system. IR may provide a channel for private firms to reduce information asymmetry and risk, fostering trust from the investors and other financial participants. Meanwhile, marginal increase in the number of firms' answers in IR management are both important for SOEs and private firms.

Third, we investigate the role of advertising in the relationship between *IR* and *CAR*. Advertising is a method of disseminating information about firms' goods or services. It could improve firm recognition in product market, and may also have important effects in stock market since some investors make their investment decisions based on familiarity (Grullon et al., 2004). Inspired by this idea, Grullon et al. (2004) find that greater advertising expenditures expand firms' shareholder base and increase stock liquidity because of higher visibility to investors, and the effect of advertising on investors is stronger for individuals than institutions. Advertising investments is positively related to stock returns after insider purchasing (Joseph and Wintoki, 2013). Firm value and unexpected growth in advertising expenditures are positively related for firms that advertise above the advertising response threshold (Kim and McAlister, 2011).

From the perspective of information disclosure, IR and advertising have similar function. Accordingly, we explore whether the advertising expenditures have moderating effect on the relationship between *IR* and *CAR*. We add *Advratio* and the interaction item *IR*Advratio* to the right-

[8] For more details about the current situation of private tourism firms, please refer to https://www.traveldaily.cn/article/131855.

Table 4
Regression of different CARs on IR in the Tourism Industry.

	$CAR_{[-7,+7]}$				$CAR_{[-10,+10]}$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
QAdummy	0.053**	0.053**			0.097***	0.096***		
	(2.07)	(2.11)			(3.42)	(3.42)		
LnQA			0.009*	0.008*			0.017***	0.017***
			(1.81)	(1.79)			(3.00)	(2.97)
Ln(Size)		−0.005		−0.002		−0.002		0.003
		(-0.51)		(-0.20)		(-0.20)		(0.23)
Ln(M/B)		−0.014		−0.013		−0.015		−0.015
		(-1.32)		(-1.28)		(-1.12)		(-1.14)
Cons	−0.089***	0.029	−0.075***	−0.018	−0.111***	−0.046	−0.088***	−0.135
	(-3.64)	(0.14)	(-3.66)	(-0.08)	(-4.14)	(-0.18)	(-3.80)	(-0.50)
Obs	80	80	80	80	80	80	80	80
R^2	0.099	0.113	0.061	0.073	0.196	0.205	0.141	0.150

Notes: This table reports the regression results of cumulated abnormal returns by different length of event windows on investor relations. $CAR_{[-7,+7]}$ and $CAR_{[-10,+10]}$ are cumulated abnormal returns calculated by a 15-day and 21-day event window, respectively. Definitions of variables are listed in Table 1. T-statistics adjusted by robust standard errors are displayed in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

Table 5
Regression of CAR on IR in pre- and post-event windows.

Panel A				
	$CAR^{Pre}_{[-5,-1]}$	$CAR^{Pre}_{[-5,-1]}$	$CAR^{Post}_{[1,5]}$	$CAR^{Post}_{[1,5]}$
	(1)	(2)	(3)	(4)
QAdummy	0.006	0.005	0.031**	0.032**
	(0.66)	(0.56)	(2.23)	(2.21)
Ln(Size)		0.000		−0.004
		(0.06)		(-0.63)
Ln(M/B)		−0.018*		0.001
		(-1.74)		(0.08)
Cons	−0.012	−0.000	−0.046***	0.035
	(-1.66)	(-0.00)	(-3.43)	(0.28)
Obs	80	80	80	80
R^2	0.004	0.069	0.100	0.105
Panel B				
LnQA	0.002	0.002	0.006**	0.006**
	(1.07)	(0.93)	(2.20)	(2.18)
Ln(Size)		0.001		−0.002
		(0.13)		(-0.31)
Ln(M/B)		−0.018*		0.001
		(-1.74)		(0.10)
Cons	−0.013*	−0.010	−0.040***	−0.001
	(-1.94)	(-0.09)	(-3.62)	(-0.01)
Obs	80	80	80	80
R^2	0.010	0.074	0.081	0.082

Notes: This table reports the regression results of pre- and post-event cumulated abnormal returns on investor relations. $CAR_{[-5,-1]}$ and $CAR_{[+1,+5]}$ are pre- and post-event cumulated abnormal return calculated by an 11-day event window, respectively. IR is measured by *QAdummy* and *LnQA* in *Panel A* and *B*, respectively. Definitions of variables are listed in Table 1. T-statistics adjusted by robust standard errors are displayed in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

hand side of Eq. (3).[9] Then coefficients of the interaction items are of our interests. The results are presented in Table 7. It shows that the coefficients of all the interaction items are negative, and are more pronounced when we measure *IR* as *LnQA*, the logarithm of the number of firms' answers during the estimation windows plus 1. This indicates that the positive effects of *IR* on *CAR* decrease as firms' advertising expenditures increase, suggesting the substitution effect between IR and advertising.

[9] The decrease in sample size is mainly due to the missing data of advertising expenditures in 2009.

Table 6
Regression of CAR on IR: the impact of ownership.

	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$
	(1)	(2)	(3)	(4)
QAdummy	0.121***	0.122***		
	(3.60)	(3.90)		
LnQA			0.019**	0.019**
			(2.37)	(2.40)
SOE	0.097**	0.095***	0.065*	0.062*
	(2.54)	(2.65)	(1.76)	(1.71)
*QAdummy*SOE*	−0.087**	−0.088**		
	(-2.13)	(-2.28)		
*LnQA*SOE*			−0.012	−0.012
			(-1.29)	(-1.31)
Ln(Size)		−0.006		−0.003
		(-0.71)		(-0.41)
Ln(M/B)		−0.013		−0.012
		(-1.05)		(-0.90)
Cons	−0.157***	−0.013	−0.123***	−0.031
	(-4.97)	(-0.07)	(-3.80)	(-0.17)
Obs	80	80	80	80
R^2	0.167	0.183	0.130	0.140

Notes: This table reports the moderating effect of ownership. $CAR_{[-5,+5]}$ is cumulated abnormal return calculated by an 11-day event window. Definitions of variables are listed in Table 1. T-statistics adjusted by robust standard errors are displayed in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

5. Conclusion

Traditional finance theory advocates that information has been incorporated into stock prices, thereby suggesting that the IR activities of merely integrating and communicating an existing information should not generate extra returns. However, empirical studies have determined the positive effects of IR on stock market performance directly and indirectly, on the basis of the consideration of limited investor familiarity with firms, incomplete information, and short-selling restrictions.

This study presents the influences of investor relations on investors' reactions in the tourism sector. Compared with the previous literature, we investigate the effects of IR on CAR during the event windows of negative incidents, other than stock prices. We find that IR reduces the negative response of investors to public-opinion-related events, and the effect is only significant in the post-event windows. Accordingly, we identify the positive role of IR in resisting the risk of falling stock price in negative events.

To clear the mechanism on how IR affects investors' reactions, we investigate the effects of state ownership and advertising on the relationship between IR and CAR. We find that the positive influence of IR is more pronounced in private firms, which may be less trusted by investors

Table 7
Regression of CAR on IR: the impact of advertising.

	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$
	(1)	(2)	(3)	(4)
QAdummy	0.031	0.033		
	(1.11)	(1.20)		
LnQA			0.011**	0.012**
			(2.09)	(2.34)
Advratio	8.481	9.358	10.571**	11.636***
	(1.65)	(1.61)	(2.57)	(2.98)
*QAdummy*Advratio*	−11.096*	−12.049		
	(-1.76)	(-1.66)		
*LnQA*Advratio*			−3.852***	−4.091***
			(-2.76)	(-2.95)
Ln(Size)		0.004		0.008
		(0.52)		(0.98)
Ln(M/B)		0.005		0.001
		(0.20)		(0.03)
Cons	−0.053**	−0.151	−0.064***	−0.242
	(-2.03)	(-0.90)	(-2.83)	(-1.36)
Obs	64	64	64	64
R^2	0.018	0.023	0.075	0.088

Notes: This table reports the moderating effect of adverting. $CAR_{[-5,+5]}$ is cumulated abnormal return calculated by an 11-day event window. Definitions of variables are listed in Table 1. T-statistics adjusted by robust standard errors are displayed in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

than SOEs when facing shocks. This result indicates the significance of IR in strengthening and restoring market confidence. Moreover, IR plays a more positive role in firms with lower advertising expenditures, thereby suggesting the substitute effects of IR and advertising on market performance.

Our findings provide implications on the IR effort. The IR system was established late in China compared with those in developed countries, and many Chinese firms have yet to realize the significance of IR. We show that investors take tourism firms' IR effort as an important factor in their investment decisions. That is, IR enables firms to resist risk and further stabilize the stock market. Our findings could help policy makers and listed firms to understand the effects of IR and motivate them to contribute substantial effort in IR activities. Our research relatively evaluates the effectiveness of the two interaction platforms established by the Shenzhen Stock Exchange and Shanghai Stock Exchange. For investors, IR may be a noteworthy factor in risk rating and price forecasting.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Procedures to derive $AR_{i,t}$

We take the 11-day *event window* as an example, over which we estimate the normal return by the capital asset pricing model (CAPM):

$$R_{i,t} = \alpha_i + \beta_i MR_t + \varepsilon_{i,t} \tag{A.1}$$

where $R_{i,t}$ denotes the daily return of firm i at time t which lies in the *estimation window* [T_0-160, T_0-6], the period of 155 trading days prior to the *event window*; and MR_t is the market return in day t. Then we obtain the estimation value of α_i and β_i, $\widehat{\alpha_i}$ and $\widehat{\beta_i}$, we calculate the normal return of listed firms as:

$$E(R_{i,t}) = \widehat{\alpha_i} + \widehat{\beta_i} MR_t \tag{A.2}$$

where t is in the *event window* [T_0-5, $T_0 + 5$]. And then we figure the abnormal return of firm i on day t:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \tag{A.3}$$

By summing up $AR_{i,t}$ in the *event window*, we obtain the cumulated abnormal return (*CAR*).

Appendix B. Tourism-related public opinion events and market responses.

Table B1 lists all the events involved, which occurred in provinces where listed firms are registered.

Table B1
Provinces involved in tourism-related public opinions and province-event cumulative average abnormal returns.

No.	Province	Event Date	Event	*CAAR*	*T-test*
1	Guangxi	2010/6/9	During a one-day tour around Guilin and Lijiang (Guangxi Province) organized by a travel agency in Guilin, the tour guide and the shopping shop conspire to extend shopping time of the tour, attract customers with malicious price reduction and sell fake and shoddy products to them.	0.0071	0.1066
2	Jiangsu	2010/7/18	A travel agency in Nanjing (Jiangsu Province) entrusted tourists who purchased a 5-day tour to Hong Kong and Macao to a local travel agency in Shenzhen without tourists' consent, and paid such a low price which is far less than the reception and service costs that the local tour guide forced tourists to shop and led to a quarrel.	−0.0007	−0.0258
3	Beijing	2010/10/10	During the National Day vacation, the "one-day tour" market in Beijing was in chaos. Some travel agencies changed tour attractions and routes arbitrarily, forced and deceived tourists to consume and insulted them.	−0.1807	−2.6597
4	Sichuan	2011/2/1	Tourist Li and others signed a travel contract with a travel agency in Chengdu (Sichuan Province) for a one-day trip to Sanya, Hainan. However, the agency asked tourists to purchase aviation insurance premiums and change the flight time without telling them. This caused the tourists to be dissatisfied and complained to the tourism department.	0.0338	0.5260

(*continued on next column*)

Table B1 (*continued*)

No.	Province	Event Date	Event	*CAAR*	*T-test*
5	Shaanxi	2011/3/7	A travel agency in Xi'an (Shaanxi Province) registered in the Industrial and Commercial Bureau of Yangling Demonstration Zone, and did not report to the local Tourism Bureau before operated their business. Later, it changed the registration name on its original license with the help of Industrial and Commercial Bureau of Yangling Demonstration Zone. During the period, the local Tourism Bureau repeatedly requested this travel agency to put on file, but the travel agency didn't file any application.	−0.0760	−1.3604
6	Hunan	2011/5/26	Some tourist shopping places around the Zhangjiajie scenic spot in Hunan Province use fake "qigong" to induce and deceive tourists to shop, in order to sell fake health care products and other drugs to tourists. Some travel agencies are also involved.	−0.0052	−0.0899
7	Guangxi	2011/10/17	Travel agency A in Pingxiang (Guangxi Province) organized 16 tourists to go to Vietnam on October 17, 2011 and have a one-day tour of Lang Son. The leader Jiang did not follow the agreement of day trips according to the time limit of the exit approval, but privately arranged an overseas three-day tour to Hanoi and Ha Long Bay. After illegally staying in Vietnam for 2 days, the crew returned back to China at 14:45 on October 19.	−0.0750	−2.7395
8	Yunnan	2012/4/17	On April 17th, 2012, Legal Mirror reported a tourism scandal in Yunnan province. A Chinese medicine health maintenance expert named Zhang Guoxi joined a tour group of "3-nights-and-4-days' tour in Xishuangbanna" organized by Kunming Zhongbei International Travel Service with his wife. Without informing the couple, this agency transferred the order to Xishuangbanna Overseas International Travel Agency and then to a car owner without any tourism qualification. On April 10th, the couple were picked up by a private car without sign of any travel agency. During the tour, the driver/guide changed the route without permission and tried to persuade them to self-paying items. After rejected by the couple, the driver insisted on taking them to jade market with speed up to 80 km/h, and nod frequently. The couple reminded him of safety but he ignored. Finally, the car ran to the opposite lane and hit with a car. Zhang died instantly and his wife was seriously injured.	−0.0249	−0.4795
9	Beijing	2012/5/11	A reporter of CCTV2 pretended to be a tourist to join a one-day tour organized by Beijing Huayuan Pengcheng Travel Agency to the Juyongguan Great Wall and the Ming Tombs. Then the problems of agency changing the sites and adding shopping points without getting the permission of tourists were exposed.	0.0013	0.0493
10	Shaanxi	2013/1/14	At 5:00 p.m., a transit car in Cuihua Mountain Scenic Spot in Xi'an (Shaanxi Province) turned on its side at the entrance of the scenic spot. The accident caused 6 serious injuries and 11 minor injuries. These passengers are employees of a company in the northern suburbs of Xi'an.	0.0162	0.7625
11	Guangxi	2013/3/30	The 16 tourists from Guilin Guangyou Domestic Tour Co., Ltd. (Guangxi Province) travelled by boat. Because the water flow was urgent and the boatman does not work properly, the tourist boat turns over at 100 m far from the Guangyan Water Cave in Guanyan Scenic Spot. The local rescue team saved 15 visitors but a 64-year-old Taiwanese tourist disappeared.	0.0074	0.0981
12	Zhejiang	2013/4/5	Due to the heavy fog, the ferry of Putuo Mountain (Zhejiang Province) was suspended and all the tourists on the island were stranded. However, the limited hotels and restaurants on the island can't satisfy so many people.	−0.0126	−0.1519
13	Hunan	2013/4/10	On April 10th, 2013, Fenghuang Ancient City (Hunan Province) implemented the "one-ticket system" which charges 148RMB per tourist. On the second day, a large number of local merchants closed their doors and gathered at the north gate of the ancient city due to dissatisfaction with ticket fare.	−0.0807	−2.1995
14	Hubei	2013/4/30	During May Day Holiday in 2013, a tourist (Mr. Chen) went to Shennongjia in Hubei province for self-driving tour. At 11:00 in the evening of April 30, he slipped on the road to the toilet in the scenic spot and suffered a comminuted fracture. As the local hospital could not perform the operation, Mr. Chen should be sent back to Wuhan. However, the driver abandoned him halfway. After the police came to mediate between the scenic spot and hospitals, Mr. Chen finally got proper treatment but still suffered from severe pain and high blood pressure for up to 20 h.	−0.1229	−2.0790
15	Hunan	2013/5/1	The tourists who left the bonfire party held at Peach Blossom Island in Fenghuang County (Hunan Province) fell into the water as they crossed the drawbridge. According to a local resident named Long, the two concrete columns at one end of the bridge fractured, and the ropes bind to the boardwalk broke, causing the bridge deck to roll over.	−0.0350	−1.0590
16	Yunnan	2013/8/5	The tourist Long Xiaoli came into conflict with the groom who asked for higher price than they agreed after her child's horse riding at the scenic spot of Dongba Grand Canyon in Lijiang (Yunnan Province) and disputed and fought with a staff there named Yang Zhen, another three female staffs also participated in their fight and beat Long.	0.0249	0.6447
17	Hunan	2013/10/2	In the evening of October 2nd, 2013, Zhangjiajie (Hunan Province) Price Bureau announced that the ticket discount following the National Day holiday (October 8th to 14th) was aimed to avoid the excessive congestion and tourist safety hazard during the week-long holiday.	−0.1835	−2.6271
18	Zhejiang	2013/10/2	On the first day of the National Day holiday of 2013, the West Lake Scenic Spot in Hangzhou (Zhejiang Province) was overcrowded. It is reported that the passenger flow of the West Lake Scenic Area reached 1.0089 million on that day, and this is the first time that the scenic spot has surpassed 1 million passengers.	−0.0253	−0.2362
19	Anhui	2013/10/5	Huangshan (Anhui Province) Scenic Area began to prohibit selling instant noodles in 2006. However, on October 4th, 2013, the media reported that the small retailers at the scenic area claimed the reason of the ban was the selfishness of the Huangshan Scenic Area who wanted to sell the boxed meal provided by themselves. The Huangshan Management Committee responded that the ban on sale of instant noodles is aimed at protecting the ecological environment of Huangshan Mountain.	−0.0399	−0.9360
20	Guangxi	2013/10/6	On October 6th, 2013, a tourist from Beijing, Mr. Li and his family felt tricked by the local villagers selling straw sandals at the gate of the scenic spot of Gudong Waterfall, Guilin (Guangxi Province), after they found that the helmets and straw sandals were bundled in the scenic area. They gave back the extra straw sandals and wanted the money back, which caused a quarrel between the seller and him. He and his family were surrounded and mauled by local villagers.	−0.0857	−2.0236
		2013/10/6	A group of 13 people from a tourist group in Shanghai was beaten by the tourist bus driver Wang and his relatives in the northwestern Guangxi, causing two young people to be wounded. An old man was injured.		
21	Sichuan	2013/10/6	Due to too many people in Jiuzhaigou (Sichuan Province) Scenic Area, a detention event occurred. Some tourists could not catch up with the bus, causing traffic congestion for several kilometers.	−0.0125	−0.1349
22	Yunnan	2013/10/6	Tourists traveling to Shangri-La (Yunnan Province) refused to compulsory consumption and were forced to get off the bus.	−0.0617	−1.4516
23	Yunnan	2014/1/2	A male guide from Lijiang (Yunnan Province) used foul words to insult tourists that "no shopping is more shameful prostitution", and declared that "Welcome to Lijiang is welcome tourists' consumption".	−0.0048	−0.1594
24	Beijing	2014/3/10	The security tried to stop a young woman engaged in an illegal business of "day trip" on the west side of the Taihe Palace Square (Beijing). But the young woman did not obey the dissuasion, and even insulted and provoked the security.	−0.0687	−1.7207
25	Yunnan	2014/6/14	In Dali and other places in Yunnan province, there were chaotic phenomena like travel agencies using low-cost tour to attract tourists but taking them to designated shopping malls where the merchants selling fake silverware.	−0.0147	−0.8744
26	Sichuan	2014/6/28	On June 28th, 2014, Emei Mountain Scenic Area (Sichuan Province) issued a notice of stop receiving tourists after 13:00 because of the geological hazards such as landslides as landslides, collapses and debris flows.	−0.0130	−0.4867
27	Hainan			−0.0545	−1.5056

(*continued on next column*)

Table B1 (*continued*)

No.	Province	Event Date	Event	*CAAR*	*T-test*
		2014/10/12	The fruit price in Sanya (Hainan Province) was extremely high. Besides, the manager in a seafood restaurant there forced visitors to sign the menu first before cooking food, but when the tourists finished their meal and prepared to check out, they were asked to pay much more than the original price provided by manager.		
28	Yunnan	2014/11/20	On November 20th, 2014, CCTV exposed the scandel of high commission and monopoly operation of Xishuangbanna Tourism Association in Yunnan province. Stuffs of Xishuangbanna Tourism Association illegally stopped two tourist buses and fought with the tour guides.	0.0026	0.1179
29	Yunnan	2015/1/10	On January 10th, 2015, snow at Kunming Changshui International Airport (Yunnan Province) caused many flight delays. In order to deice, flight MU2036 closed the air conditioner after passengers' boarding. An old female felt uncomfortable because of the poor ventilation in the cabin. Most passengers asked for explanation, but received unsatisfied respond from the assistant captain, which caused disputes between passengers and the flight crew. some passengers opened the three emergency exits and led the flight to abort takeoff.	−0.0515	−1.5246
30	Hunan	2015/4/28	A tour guide was assigned to the tour guide service of the 50-person individual group and on the way to Zhangjiajie (Hunan Province), he sold a self-paying project to tourists and only arranged lunch for the tourists who participate in the project, leading to dissatisfaction of the tourists. The guide went to the restaurant kitchen and took a kitchen knife out to threaten the tourists.	0.0017	0.0208
31	Hainan	2016/3/2	Inside a tour bus in Sanya (Hainan Province), a middle-aged man and a middle-aged woman from northeast China were late to go on the bus and their seats were occupied by other tourists. The male guide tried to coordinate but failed to solve the problem. The two tourists argued with the tour guide and the man repeatedly insulted him.	−0.0576	−0.5691
32	Yunnan	2016/6/1	Thousands of merchants in the ancient city of Lijiang (Yunnan Province), collectively stopped opening up to protest the new charging policy which led to the plummet of number of tourists as well as the loss of business.	0.0109	0.4152
33	Beijing	2016/7/23	In the Badaling Wildlife Park in Yanqing, Beijing, two self-driving female tourists were attacked by tigers in the beast area, causing one death and one injury.	−0.0280	−0.8320
34	Yunnan	2016/10/17	A tour guide in Yunnan Province forced tourists to buy jade, claiming that if the tourists did not buy enough, they won't be able to leave Yunnan Province that day.	−0.0145	−0.2099
35	Yunnan	2017/1/24	On the eve of the Spring Festival of 2017, a Weibo user "Linyi is me" exposed his experience of being beaten to disfigurement without any reason in Lijiang (Yunnan Province), and questioned the local police's inaction.	0.0624	1.3774
36	Yunnan	2017/2/18	A government official of Yunnan Province made a speech in the WeChat group referring that the reporter who satirized the negative news in Yunnan was a fly, which caused heated discussion among the media and the public.	−0.0384	−1.1108
37	Yunnan	2017/6/28	In a jade shop in Ruili (Yunnan Province), a female customer tried to wear a bracelet. After informed that it cost 300,000 RMB, she wanted to take it off. Unexpectedly, the bracelet fell on the tile floor and broke into two pieces. The customer and shop negotiated on compensation but did not reach an agreement.	0.0008	0.0271
38	Yunnan	2017/8/18	On August 18th, 2017, a sophomore sent a message via Sina Weibo that she was beaten by a man in the last night when she was traveling in Kunming (Yunnan Province). After treatment, she got multiple stitches in the back of her head and was still unable to open her left eye.	0.0104	0.4496
39	Beijing	2017/8/21	A male tourist in Badaling wildlife park (Beijing) opened his car window to feed animal and did not expect not far away a black bear suddenly rushed over trying to get into the car. This male tourist, with his whole body exposed in the vision of the black bear, got his left arm swallowed by the black bear immediately.	−0.0337	−1.2914
40	Yunnan	2017/11/13	A tourist from Chongqing went to Lijiang (Yunnan Province) booked an inn on the Internet and was bitten by mosquitoes at midnight so that he could not sleep. The next day he was told the mosquitoes were pets raised by the inn and he had to pay for the mosquitoes killed by him.	−0.0399	−1.0717

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