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Corporate governance, technical efficiency and financial performance: Evidence from Chinese listed tourism firms

Hongsong Peng [a,b], Jinhe Zhang [c], Shien Zhong [a,b,*], Peizhe Li [d,e]

[a] School of Business Administration, Nanjing University of Finance and Economics, Nanjing, 210046, China
[b] Tourism Industry Development Institute, Nanjing University of Finance and Economics, Nanjing, 210046, China
[c] Department of Land Resources and Tourism Sciences, Nanjing University, Nanjing, 210023, China
[d] Hainan University-Arizona State University Joint International Tourism College, Hainan University, Haikou, 570228, China
[e] School of Community Resources and Development, Arizona State University, Phoenix, AZ, 85004, USA

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ABSTRACT

Based on the panel data of Chinese listed tourism firms, this study provides empirical evidence regarding the relationships among corporate governance, technical efficiency, and financial performance. It is the first study to explore such relationships in the tourism industry. The results indicate a positive linear relationship between technical efficiency and financial performance and confirm the mediating effect of technical efficiency on the interconnectedness of board independence, ownership concentration, and financial performance. Finally, this study theoretically supports the contingency corporate governance model (Oehmichen, Schrapp, & Wolff, 2016) and our established analysis framework of "corporate governance-technical efficiency-financial performance." We also provide several managerial implications to help tourism firms improve their overall performance.

1. Introduction

Since the beginning of the 21st century, the prevalent universality of international financial scandals and the collapse of well-known multinational companies, owing to poor corporate governance, shocked the public (Bhagat & Bolton, 2019). Under this background, theories, and hypotheses, such as the agency theory, stewardship theory, resource dependence theory, monitoring hypothesis, and the strategic alignment hypothesis, are constantly developing and effectively explaining the causes of corporate governance issues. At the same time, an increasing number of regulations, including the *Sarbanes Oxley Act*, *Dodd-Frank Act*, and *G20/OECD principles of corporate governance* (Duchin, Matsusaka, & Ozbas, 2010; OECD, 2016a), are now pushing for higher and universal governance guidelines. Such regulations, for instance, regulate how state-owned enterprises (SOEs) respond to their unique governance challenges and require more significant participation of independent directors on the board. Collectively, these either provide theoretical insights or practical guidelines for improving the effectiveness of corporate governance.

The separation of ownership and management functions and the presence of asymmetric information introduce the possibility of principal-agent conflicts because the manager's self-interest may lead to the misuse of corporate assets (Haniffa & Hudaib, 2006). Good corporate governance provides a practical framework for balancing ownership and control, proper incentives for the board and management to pursue objectives in the company's interests and shareholders, the equitable treatment of shareholders and other stakeholders, and effective monitoring (Monks & Minow, 2004). In this context, scholars have considered corporate governance, especially the relationships between various components of corporate governance and firm performance. However, there is no consensus (Guillet, Seo, Kucukusta, & Lee, 2013). Specifically, the relationship between corporate governance and firm performance has been the subject of much debate in the literature, some of which are contradictory. Therefore, defining what good corporate governance is and how it affects performance are still issues of concern. This paper argues that there may be three knowledge gaps in the existing research.

First, a potential explanation for the inconsistent results may exist in the various contexts of the studies (Haniffa & Hudaib, 2006; Ooi, Hooy, & Mat Som, 2015). As advocated by the contingency corporate governance model, governance practices vary across countries and industries (Oehmichen et al., 2016). However, the published papers have seldom

* Corresponding author. School of Business Administration, Tourism Industry Development Institute, Nanjing University of Finance and Economics, 3 Wenyuan Road, Qixia district, Nanjing city, Jiangsu Province, 210046, China.
E-mail address: fgh1475@163.com (S. Zhong).

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focused on the listed tourism firms in the Chinese cultural, business, and institutional context.

Specifically, the principles outlined in most of the codes or guidelines in emerging countries and transitional economies are primarily derived from experiences and recommendations in developed countries. They may not necessarily apply to these economies. In emerging countries and transitional economies, institutional, legal, and cultural constraints on corporate behavior are generally weak compared to those in developed countries (Jiang, Lee, & Yue, 2010). Meanwhile, every country has its respective national character and social and economic priorities, and as such, what is desirable in one country may not be so in another (Haniffa & Hudaib, 2006). In China, most listed firms are former SOEs, and the government remains the largest shareholder in many of those firms. Although state ownership may lead to problems, such as bureaucracy, low efficiency, and confusion of functions between government and business, SOEs could still obtain more development resources than private enterprises. Moreover, Chinese specific cultural factors, such as *guanxi* (in Chinese: "关系"), *face* (in Chinese: "面子"), *Confucianism* (in Chinese: "儒教"), and *collectivism* (in Chinese: "集体主义"), also profoundly affect the effectiveness of Chinese corporate governance system (such as independent director system) (Li & Hao, 2015; Yang, 2009). Therefore, studies using samples from China are more likely to examine cross-cultural differences in corporate governance practices and potentially generate more precise results.

Furthermore, the recent governance literature recognized that different systems of governance are appropriate for different industries. However, most studies on corporate governance do not consider industry characteristics, which may lead to the thinking that "one type fits all" (Oehmichen, 2018; Yeh, 2018). For industry-level factors, such as high levels of capital intensity, unstable market status with intense competitions, sensible to economic fluctuations, high ratios of short-term decisions, and the separation of ownership from management (DeFranco & Lattin, 2006; Guillet & Mattila, 2010). Tourism firms may exhibit unique governance structures that need to be explored.

Second, the mainstream literature has adopted the ratio method to measure financial and market performance. In recent years, the business and management literature has indicated that the technical efficiency in the field of economics well reflects essential attributes of the firm's input-output production process; thus, adopt it as an alternative performance indicator (Bozec, Dia, & Bozec, 2009; Jarboui, Guetat, & Boujelbène, 2015). However, except for Ben Aissa and Goaied (2016) and Guetat, Jarboui, and Boujelbene (2015), the current tourism literature hardly incorporates technical efficiency into their governance-performance analysis framework. Consequently, the role of technical efficiency in this relationship is unclear (Park & Jang, 2010).

Third, the early studies of the governance-performance relationship primarily employed individual governance indicators. With the availability of more comprehensive data sources, corporate governance research has started using large indices (Madanoglu, Kizildag, & Ozdemir, 2018). In recent years, some scholars noticed that corporate governance is a complex system and began to consider various governance variables as an entity on firm performance (Al-Najjar, 2014; Chen, 2010; Tan, Habibullah, & Tan, 2017). However, we still know little about how the various components of governance operate together to affect performance.

Seeking to fill up the research gaps mentioned above, this study adopts a panel data regression model based on 2010 to 2019. It explores the relationships among corporate governance, technical efficiency, and financial performance in Chinese listed tourism firms. This study makes several contributions to the literature. First, following the proposal of the contingency corporate governance model, this study provides empirical evidence of the governance-performance relationship under the context of Chinese listed tourism firms. Second, this paper introduces technical efficiency into the traditional analysis framework of the governance-performance relationship. Third, this paper regards governance as a system and comprehensively considers the impacts of various governance proxies on firm performance.

2. Theoretical framework and hypotheses development

First, we develop the mediating hypothesis of technical efficiency in the relationship between the overall corporate governance and financial performance. Subsequently, we focus on reviewing the possible relationship between specific governance components (such as board independence, the board size, CEO duality, state ownership, and ownership concentration) (Wang, Xu, Scott, & Ding, 2014; Yeh, 2018; Yeh & Trejos, 2013) and financial performance under the context of Chinese listed tourism firms. The above two hypotheses are interrelated and complementary to each other, which helps to explore the relationships among corporate governance, technical efficiency, and financial performance.

2.1. Corporate governance, technical efficiency, and financial performance

Corporate governance and its components (such as board characteristics, ownership structure, and incentive mechanism) refer to a series of relationships among a company's management, board, shareholders, and other stakeholders (OECD, 2016a). On the other hand, technical efficiency and financial performance are two types of indicators for measuring firm performance. Specifically, technical efficiency means the "operational" efficiency of using specific inputs to create as much output as possible, which can be regarded as an indicator for measuring the performance of the production process. Financial performance is considered the "ultimate" indicator for measuring performance. Recent literature has confirmed the significant relationship between corporate governance and financial performance, and it has further confirmed that "ultimate" financial performance is determined by or related to the "operational" technical efficiency (Moon & Min, 2020; Olson & Zoubi, 2011). On the other hand, recent studies regarding manufacturing industries also confirmed that corporate governance can greatly impact technical efficiency. For instance, based on the comprehensive governance index of Canadian firms, Bozec et al. (2009) find that better-governed firms are more efficient comparing with less governed firms. Walheer and He (2020) suggest that firm ownership is essential in explaining technical efficiency, and renationalization policies may undermine technical efficiency among Chinese manufacturing firms.

In tourism literature, although abundant studies have investigated the technical efficiency (Oukil, Channouf, & Al-Zaidi, 2016; Yang, Xia, & Cheng, 2017) and the governance-performance relationship (Wang et al., 2014; Yeh & Trejos, 2013). Yet, little attention has been dedicated to the relationship between technical efficiency and financial performance. Chen (2010) realized that technical efficiency needs to be considered in the study of corporate governance and financial performance, but no empirical research has been conducted. Moreover, using profitability as the proxy index of financial performance, Ben Aissa and Goaied (2016) confirm that technical efficiency is a positive determinant for hotel financial performance. However, to our knowledge, current tourism literature rarely incorporates technical efficiency into its governance-performance analysis framework, which leads to the role of technical efficiency in this relationship not being clear. We believe that introducing the technical efficiency of the production process as the mediator helps better understand how governance and its components affect the "ultimate" financial performance. Thus, this study attempts to establish an analytical framework of "corporate governance-technical efficiency-financial performance" and proposes the following hypotheses:

H1a. Technical efficiency has a significantly positive impact on financial performance in Chinese listed tourism firms.

H1b. Technical efficiency mediates corporate governance's effect on financial performance in Chinese listed tourism firms.

2.2. Board independence and financial performance

The effectiveness of independent directors has been widely examined in governance literature, while the results are mixed (Yeh, 2018). Agency theorists argue that independent boards might help reduce the agency problem by monitoring the opportunistic behavior of the management (Jensen & Meckling, 1976). At the same time, independent directors' professional knowledge, prestige, and social relations affect the directors' deliberation and decision-making and provide strategic guidance and improve performance. Empirical studies of several single countries, such as Australia, the U.K., and Korea, document that board independence positively contributes to financial performance (Black & Kim, 2012; Dahya & McConnell, 2007; Setia-Atmaja, Haman, & Tanewski, 2011). Yeh (2013) concludes that in the tourism literature, Tobin's Q and return on assets were positively influenced by board independence in Taiwan's listed hotel firms. Moreover, Al-Najjar (2014) indicates that board independence is positively related to financial performance and stock performance in five Middle Eastern countries.

However, increasing the number and proportion of independent directors is viewed with skepticism by some scholars. Theoretically, compared to inside directors, it has long been recognized that the effectiveness of independent directors is limited by their asymmetric information (Duchin et al., 2010; Jensen, 1993). Meanwhile, the effectiveness of independent directors is questioned due to their lack of experience and firm-specific knowledge. Some studies confirm this view and find a negative relationship (Bhagat & Bolton, 2013; Yang, 2018).

In the business context of China, although independent directors are elected and appointed by the shareholders' meeting, the rules regarding the procedure of shareholders' meeting are that the controlling shareholders have the most voting rights. The controlling shareholders also have the qualification to nominate independent directors. They usually prefer to nominate independent directors they are familiar with or have a good cooperative relationship with them. Meanwhile, under the Chinese specific cultural context, which includes the aspects of *guanxi*, *face*, *Confucianism,* and *collectivism*, the independent directors may be reluctant to express their opposition to maintain their good *guanxi* and to save *face* between the inside directors and themself (Li & Hao, 2015). These terms embedded with Chinese philosophical ideologies might harm the effectiveness of board independence. Hence, our question is, under the influence of these factors, are the independent directors of Chinese listed tourism firms independent and effective? The following competitive hypothesis was developed.

H2a. Board independence has a significantly positive impact on financial performance in Chinese listed tourism firms.

H2b. Board independence has a significantly negative impact on financial performance in Chinese listed tourism firms.

2.3. Board size and financial performance

The board size is one of the key corporate governance fields (Al-Najjar, 2017). Resource dependence theorist believes that the board of directors is an intermediary between an enterprise and its external environment (Yeh, 2018). The large board can access critical resources, bring more experience, knowledge, and skills, and reduce external uncertainty (Dalton, Daily, Johnson, & Ellstrand, 1999). Some empirical studies support this viewpoint and demonstrate a positive relation between board size and financial performance (Coles, Daniel, & Naveen, 2008; Dalton & Dalton, 2005).

Conversely, another view is that a large board of directors weakens the efficiency of supervision, control, and decision-making (Lipton & Lorsch, 1992). Jensen (1993) suggests that, compared with large boards, trim boards have better cohesion, supervision, and production. Some empirical studies also demonstrate that board size is negatively correlated with financial performance in the U.S. (Yermack, 1996), Malaysia (Haniffa & Hudaib, 2006), Ireland (O'Connell & Cramer, 2010), and ten OECD countries (De Andres, Azofra, & Lopez, 2005).

In the tourism industry, companies are in a dynamic environment easily affected by external factors (Yeh, 2018; Yeh & Trejos, 2013). In this ever-changing environment, a company's success depends, to a large extent, on top management to make appropriate decisions for maintaining the competitive advantage of the company (Carpenter & Westphal, 2001). However, the recent tourism literature about the results of the impact of board size is inconsistent. Yeh and Trejos (2013) contend that the board size is negatively related to Tobin's Q and return on assets. Al-Najjar (2014) finds that large boards enhance profitability, but small boards are more efficient in stock performance. Yeh (2018) argues that the small boards have the advantages of efficient communication, cooperation, and decision-making.

As advocated by the contingency corporate governance model (Oehmichen et al., 2016), the board of directors is an effective supervisor or an invalid rubber stamp, depending on the institutional context (Tian & Lau, 2001). Therefore, the philosophically embedded terms under the Chinese cultural context, including *guanxi*, *face*, *Confucianism*, and *collectivism*; the members of a large board of directors might be reluctant in expressing different opinions of theirs since they tend not to ruin this collaborative, harmonious atmosphere (Yang, 2018). Thus, we developed the following competitive hypothesis.

H3a. Board size has a significantly positive impact on financial performance in Chinese listed tourism firms.

H3b. Board size has a significantly negative impact on financial performance in Chinese listed tourism firms.

2.4. CEO duality and financial performance

CEO-duality is an essential measuring indicator for board leadership, and much attention has emphasized the duality-performance relationship. Two conflicting views existed in the current governance and performance literature.

Agency theory holds the negative influence of CEO duality stemming from it permits the CEO to pursue private benefits and reduce the board's oversight power (Jensen, 1993). This view suggests that CEO duality reduces firm performance. However, contrary to the assumption of agency theory that executives are inherently opportunistic, stewardship theory argues that managers want to be good stewards of the firms. CEO duality improves firm performance by reducing agency costs, maintaining good communication, implementing the unified command, and responding faster to the external environment (Guillet et al., 2013). Using a variety of performance proxies, the prior studies find both positive (Iyengar & Zampelli, 2009) and negative (Davidson, Jiraporn, Kim, & Nemec, 2004) effects of CEO duality on firm performance.

In the tourism literature, the duality-performance relationship has been controversial. Some studies suggest that CEO duality promotes performance due to the industry-level factors, such as its highly competitive nature, sensitivity to economic fluctuations, strong seasonality, and the high proportion of short-term decisions (Guillet & Mattila, 2010; Guillet et al., 2013). Among those studies, Oak and Iyengar (2009) believe that the duality of the CEO helps to improve the strategic decision-making of hotel companies, leading to better performance. Guillet et al. (2013) further state that CEO duality contributes to improving restaurants' performances based on the stewardship theory. However, another view opposes the positive impact of CEO duality on performance. It suggests that the tourism industry is prone to agency problems due to the separation of ownership and management rights and the high level of capital intensity, which requires the separation of the two positions (DeFranco & Lattin, 2006; Guilding, 2003). We propose the following competitive hypothesis.

H4a. CEO duality has a significantly positive impact on financial performance in Chinese listed tourism firms.

H4b. CEO duality has a significantly negative impact on financial

performance in Chinese listed tourism firms.

2.5. State ownership and financial performance

The impact of state ownership on firm performance has attracted increasing attention in the academic literature. In many emerging countries and transitional economies, SOEs still account for an essential share of GDP, employment, and market value. On the one hand, the public owners of SOEs may exercise their ownership passively due to information asymmetry, which may lead to the first type agency problem (Liu, Miletkov, Wei, & Yang, 2015). On the other hand, there may be existing phenomena, such as the grabbing hand effect, excessive administrative intervention, and the balance between economic goals and public objectives (OECD, 2016b; Shleifer & Vishny, 1997). Consequently, state ownership may lead to poor performance. The literature on governance and business also examined this relationship, and the main conclusions support the agency theory that state ownership is negatively correlated with firm performance (Liu et al., 2015).

However, there is another view that compared with private enterprises, SOEs can obtain critical resources through the helping hand of the government (OECD, 2016b). When there are competing resources and government policy support, they can obtain prices or conditions superior to private competitors. Based on the sample of listed firms in China, Yang (2018) provides evidence that state ownership does not damage financial performance. It even plays a significant role in promoting financial performance.

Similarly, most Chinese listed tourism firms are SOEs, leading to the above problems and poor performance (Chen, Chen, & Wei, 2017; Wang et al., 2014; Wei, Xie, & Zhang, 2005). However, the helping hand effect of the government is also an available feature in Chinese listed tourism firms. For instance, SOEs monopolize the natural and cultural attractions with the highest endowments and high-quality tourism reception facilities, which help to attract more tourists in the face of fierce market competition. The following competitive hypothesis was developed.

H5a. State ownership has a significantly positive impact on financial performance in Chinese listed tourism firms.

H5b. State ownership has a significantly negative impact on financial performance in Chinese listed tourism firms.

2.6. Ownership concentration and financial performance

As a corporate governance mechanism, the ownership concentration has also been widely discussed in the governance literature. The scholars follow different theoretical frameworks about this topic. The monitoring hypothesis argues that blockholders have the motivation and ability to monitor firms, which can alleviate agency costs. Shleifer and Vishny (1997) find that a high ownership concentration promotes business performance and value growth. Conversely, the strategic alignment hypothesis suggests that a high concentration of ownership might lead to collusion between large shareholders and executives to infringe on the interests of other shareholders, which is also called the second type agency problem (Burkart & Panunzi, 2006). Therefore, there is a so-called strategic alignment effect for such blockholders (Sánchez-Ballesta & García-Meca, 2007).

However, few tourism studies focus on the concentration-performance relationship in the context of emerging countries and transitional economies. Specifically, compared to developed countries, the ownership structure of a tourism firm in these areas will be more concentrated. Yeh and Trejos (2013) find that the existence of major shareholders has a significant favorable influence on return on assets and Tobin's Q. In contrast, Al-Najjar (2015) demonstrates that institutional investors with a significant stake are self-opportunists and negatively affect performance. Accordingly, we posit the following competitive hypothesis.

H6a. Concentrated ownership has a significantly positive impact on financial performance in Chinese listed tourism firms.

H6b. Concentrated ownership has a significantly negative impact on financial performance in Chinese listed tourism firms.

3. Methodology

3.1. Estimation of technical efficiency using SFA

There are predominantly two methods for measuring the technical efficiency in the tourism industry: nonparametric data envelopment analysis (DEA) and parametric stochastic frontier analysis (SFA). Compared to DEA, the SFA enables statistical inferences to be made on efficiency scores and separation of error terms from inefficiency terms (Barros, 2004;Yang, Cao, & Yang, 2017). Thus, this research uses the parametric approach with the stochastic frontier production function for the panel data, as proposed by Battese and Coelli (1995). For the SFA model, we chose the true fixed effects SFA considering the heterogeneity of firms (Greene, 2005). According to Kneller and Andrew Stevens (2003), in specifying the production function in the SFA, the *translog* production function form, which incorporates the quadratic terms and interaction terms, is preferred over the Cobb-Douglas form. Therefore, our SFA model is specified in a *translog* form.

Another critical issue in any SFA application is the selection of inputs and outputs. The outputs should reflect the business goals, and the inputs should be the required resources for achieving these goals. According to data availability and previous literature (Chatzimichael & Liasidou, 2019; Yang, Cao, & Yang, 2017), we specified two input variables and one output variable to obtain the technical efficiency. The input variables are the total number of employees (*labor*) and total assets (*capital*) for the listed tourism firms. The output variable is the total operating income (*income*). The model is specified as follows:

$$\ln Income_{it} = \alpha_i + \alpha_1 \ln Labor_{it} + \alpha_2 \ln Capital_{it} + \alpha_3 (\ln Labor_{it})^2 + \alpha_4 (\ln Capital_{it})^2 + \alpha_5 \ln Labor_{it} * \ln Capital_{it} + \nu_{it} - \eta_{it} \quad (1)$$

where i represents the firm, and t represents the year. ν_{it} represents the random errors, which are assumed to be *iid.* with an $N(0, \sigma_\nu^2)$ distribution, whereas η_{it} represents the non-negative term referring the technical inefficiency with a truncated-normal distribution. Therefore, the technical efficiency is predicted as follows:

$$\theta_{it}^* = E\left(\exp(-\eta_{it}) \middle| \widehat{e}_{it} = \widehat{\nu}_{it} - \widehat{\eta}_{it}\right) \quad (2)$$

where θ_{it}^* is the technical efficiency for firm i in year t.

3.2. Panel regression analysis of corporate governance, technical efficiency and financial performance

The panel regression model is employed to test the above hypothesis. Considering that the pooled model may be biased due to omitted variable bias, we used the fixed effect regression. Compared to the random-effects model, the fixed effects model places fewer restrictions and allows interdependence between μ_i and the other explanatory variables (Yang, Cao, & Yang, 2017). We also apply the Lagrange Multiplier test and the Sargan-Hansen test (Sargan, 1958) to select the pooled, fixed, and random effects models. Thus, the next panel fixed effects model is performed:

$$Performance_{it} = \beta_0 + \beta_1 Eff_{it} + \beta_2 Indep_{it} + \beta_3 Bsize_{it} + \beta_4 Duality_{it} + \beta_5 Stateowned_{it} + \beta_6 Concent_{it} + \psi \text{Firmspecifics} + \mu_i + \varepsilon_{it} \quad (3)$$

Performance is measured in two different financial measurement ways for testing the robustness, namely, *ROA* and *ROE* (Al-Najjar, 2014;

Yoon & Chung, 2018). *Eff* is the technical efficiency; *Indep* is the proportion of independent directors on the board; *Bsize* is the number of directors on board; *Duality* is a dummy variable capturing the CEO who is also the chairman of board; *Stateowned* is a dummy variable that takes 1 for the top shareholder of the firm is the state and 0 for others; *Concent* is the percent shares controlled by the top shareholder.

Firmspecifics, as control variables, include *Fsize*, *Leverage,* and *Growthopp*. *Fsize* refers to the natural logarithm of total assets. It is documented in the literature that firm size is a positive factor affecting financial performance (Al-Najjar, 2015). *Leverage* refers to the ratio of total debt to total equity. The pecking order theory suggests a negative leverage-performance relationship (Al-Najjar, 2014). By contrast, the leverage-signaling theory shows that debt is a credible signal of the quality of firms and has a positive relationship between them (Park & Jang, 2010). *Growthopp* is the market to book ratio. The recent studies suggest that growth opportunities improve financial performance (Ooi et al., 2015).

To overcome the potential endogeneity, the heteroscedasticity robust Durbin-Wu-Hausman test (Wooldridge, 2003) was employed to test whether there were endogenous variables. If endogenous variables exist, the 2SLS model needs to be conducted. Finally, to explore the mediating effect of technical efficiency on corporate governance and financial performance. The three-step method (Baron & Kenny, 1986) is conducted. The bootstrap method, which offers an alternative that imposes no distributional assumption (Hayes & Preacher, 2014), is then used to obtain robust results.

3.3. Sample and data

This study follows the classification of the tourism industry of China National Bureau of statistics in selecting our sample. We start the sample selection process from nearly 40 listed tourism firms on the Shanghai and Shenzhen Stock Exchanges in China and based on the following principles to select our samples: ① To ensure the representativeness of the samples; we exclude firms listed in the growth enterprises market due to their relatively loose listing conditions; ② The firm's primary business is tourism and tourism-related industries and has not changed over the study period; ③ To ensure that all the sample firms have long observation series, we exclude firms that were listed after 2014; ④ ST, *ST and delisted firms with poor financial conditions are excluded. Finally, resembling the study by Ren, Liu, Zhao, and Zhao (2017), 26 firms that involve sightseeing, accommodation, catering, entertainment, and tourism comprehensive services were selected as our sample (please seeAppendix B).

We obtain data from the Chinese Securities Market and Accounting Research Database. Some missing data are supplemented from the annual reports of each of the firms. Finally, the requisite input, output, governance, and financial performance data of 26 firms from 2010 to 2019 are obtained. To mitigate the bias caused by extreme outliers, we truncate *ROA* and *ROE* by 1% at both tails.

Table 1
Descriptive statistics of the variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Lnincome	260	20.845	1.617	9.044	24.818
Lnlabor	260	7.814	1.209	3.219	10.616
Lncapital	260	21.782	1.300	16.520	26.662
ROA	260	0.040	0.085	−0.860	0.283
ROE	257	0.068	0.103	−0.627	0.382
Indep	260	0.376	0.076	0.250	0.750
Bsize	260	9.265	1.732	4	15
Duality	260	0.085	0.279	0	1
Stateowned	260	0.796	0.404	0	1
Concent	260	33.914	13.932	11.560	61.350
Fsize	260	21.782	1.300	16.520	26.662
Leverage	260	0.688	1.898	−27.700	4.077
Growthopp	258	2.692	5.168	0.930	69.876

Table 1 presents the descriptive statistics of the variables. The firms in our sample have relatively low financial performance, the average *ROA* is 4%, and the average *ROE* is approximately 6.8%, which is lower than the financial performance of listed tourism firms in the U.K. (Al-Najjar, 2017), Taiwan (Yeh, 2018) and five Middle Eastern economies (Al-Najjar, 2014). The average value of *Indep* is approximately 38%, suggesting that the intermediate level of board independence is moderate. It is higher than the 17% average in Taiwan (Yeh, 2018) and the 30% average in five Middle Eastern economies (Al-Najjar, 2014). It also goes far below the 79% average in the U.S. (Ozdemir & Upneja, 2012) and the 64% average in the U.K. (Al-Najjar, 2017). The average value of *Bsize* is greater than 9 members. Compared with the board size of listed tourism firms in other economies, there is a relatively large board in Chinese listed tourism firms. Moreover, the proportions of the CEO duality and SOEs are 8% and 79%, respectively. Finally, the firms had an average *Concent* of 33%, ranging from 11% to 61%, indicating a high level and a considerable variation of ownership concentration in our sample.

4. Results

4.1. SFA model

Table 2 presents the results of the SFA model. Except that the variable *lncapital* is not significant, all the variables are statistically significant, indicating that the model has a good fit. In Fig. 1, we report the box plot of the technical efficiency estimated from the SFA. The results show that the average technical efficiency was 0.637, suggesting that the Chinese listed tourism firms experienced a relative inefficiency of approximately 36.3%. This result is close to the value of 0.751 measured by Ren et al. (2017) using the DEA model from 2011 to 2015, implying that Chinese listed tourism firms did not use their labor and capital efficiently to maximize revenue. The average technical efficiency demonstrates a fluctuating increasing trend over time. The distribution of technical efficiency is seriously right-skewed toward 1, suggesting the firms have strong potential for efficiency growth. Finally, there are huge differences among the estimated technical efficiency.

4.2. Panel regression models of corporate governance, technical efficiency, and financial performance

In Table 3, we report that the correlation coefficients of the independent variables are not higher than 0.5 (except for the coefficient between *Fsize* and *Indep,* which was 0.520). Thus, multicollinearity is not of concern in our models. We also run the variance inflation factor (VIF) tests for our models. All the VIF values are far below the tolerance range of 10, with mean values of 1.82 and 1.84, respectively, confirming that no multicollinearity problems exist in our models.

We employed the panel fixed effects model to explore the relationships among corporate governance, technical efficiency, and financial performance. Financial performance, namely *ROA* in Model 1 and *ROE*

Table 2
Results of true fixed-effect SFA.

Variable	Coef.	Std. Err.
Lnlabor	1.136**	0.573
Lncapital	−0.174	0.737
$(Lnlabor)^2$	0.107***	0.033
$(Lncapital)^2$	0.037*	0.021
*Lnlabor * Lncapital*	−0.109***	0.036
σ_v	0.106***	0.022
σ_η	16.048***	0.015
Groups	26	
Observations	260	
Log likelihood	−146.898	

Notes: * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

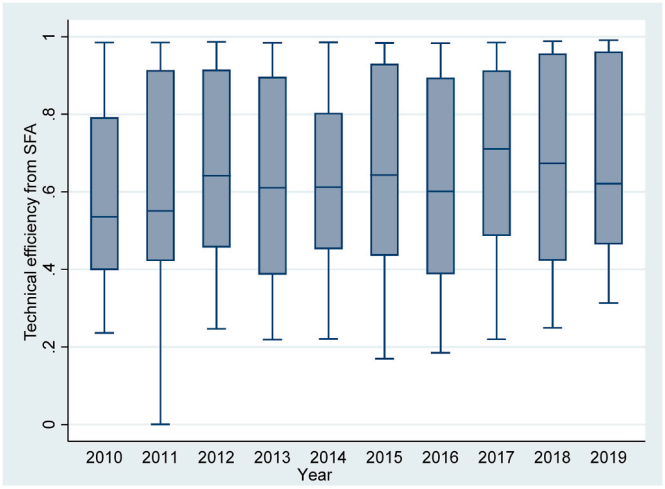

Fig. 1. Box plot of technical efficiency over time (2010–2019).

in Model 2, was used as the dependent variables, and the results are presented in Table 4. The significant value of the Lagrange Multiplier test indicates that the random effects models are more suitable than the pooled models. Moreover, the substantial value in the Sargan-Hansen test suggests that the fixed effects model is outperformed.

Model 1 and Model 2 both show a statistically significant positive impact of technical efficiency on financial performance. The marginal effect is estimated to be 0.080 ($p < 0.10$), 0.127 ($p < 0.01$), showing that technical efficiency increased by 1%, and *ROA* and *ROE* increased by 8%, 12.7%, respectively. This result indicates that the higher the technical efficiency, the higher the level of financial performance, supporting H1a, and echoes the point addressed by Ben Aissa and Goaied (2016). This result is also confirmed by Fig. 2, which presents a scatterplot of technical efficiency and *ROA*, *ROE* for Model 1 and Model 2, respectively. Therefore, Chinese listed tourism firm administrators must improve the "ultimate" financial performance according to the determinants of "operational" technical efficiency, such as the management level, technology utilization, and resource allocation ability.

Board independence has a significant negative impact on *ROA* and *ROE* in both Models. Therefore, the negative effects of the board independence on financial performance is confirmed, which is in line with H2b, whereas H2a is rejected. This finding also contradicts that board independence promotes financial performance, as argued by the agency theory and resource dependence theory. It is mainly due to the inherent disadvantages of independent directors, and independent directors are not independent under the Chinese context (Li & Hao, 2015). According to the statistical results of the opinions and votes of the independent directors of each firm over time, we find that there are almost no objections among the 2941 opinions, which further confirms the above inferences. Thus, empowering independence for directors while coordinating the interrelation of the legal system and the Chinese philosophy of life can be an effective way to enhance financial performance.

Note that the board size has a negative but insignificant impact on *ROA* and *ROE*, suggesting that the greater the board size, the lower the financial performance. H3b is accordingly partially supported. This finding also rejects the standpoint of resource dependence theorists that a large board promotes financial performance; however, this finding is consistent with Yeh and Trejos (2013) and Yeh (2018). The possible reasons are as follows: the low efficiency of communication and coordination and the increase of the "free-riding" phenomenon in large boards; the members of the large board are not willing to shatter the collaborative atmosphere and raise objections, leading to the loss of the board's supervisory function. In time, it simply becomes a rubber stamp of management and major shareholders (Tian & Lau, 2001).

The CEO duality variables are estimated to be negatively related to both models' financial performance; however, this result is insignificant. This result partially supports the agency theory, whereas it rejects the stewardship theory regarding the relationship between CEO duality and financial performance. This finding also partially corroborates H4b and echoes Guilding's (2003) viewpoints and DeFranco and Lattin (2006). It reaffirms that our findings have substantiated the importance of the board chairman and the CEO's separation in improving the financial performances. One possible explanation is that the tourism industry is prone to agency problems due to the separation of ownership and management and the high level of capital intensity. The synergies associated with implementing the separation of board chairman and CEO outweigh the benefits of CEO duality.

In contrast to the results of the previous research (Wang et al., 2014; Wei et al., 2005), state ownership has a positive impact on *ROA* and *ROE*, which is not supported by the significance test. However, this finding partially supports H5a and echoes the views of Yang (2018). Compared with the government's grabbing hand effect, the helping

Table 4
Results of panel data models with financial performance.

	Model 1 (DV = *ROA*)		Model 2 (DV = *ROE*)	
	Coef.	Std. Err.	Coef.	Std. Err.
Eff	0.080*	0.041	0.127***	0.041
Indep	−0.102**	0.038	−0.106*	0.056
Bsize	−0.003	0.003	−0.003	0.003
Duality	−0.027	0.018	−0.036	0.033
Stateowned	0.032	0.029	0.006	0.013
Concent	0.002**	0.001	0.002	0.001
Fsize	0.029	0.019	0.062**	0.026
Leverage	−0.025*	0.012	−0.038*	0.021
Growthopp	0.001	0.005	0.012**	0.005
Constant	−0.638	0.404	−1.286**	0.544
Groups	26		26	
Observations	258		255	
Sargan-Hansen test	34.920***		28.353***	
Within R^2	0.322		0.293	
Between R^2	0.381		0.535	
Overall R^2	0.307		0.396	

Notes: Standard errors are robust; * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

Table 3
Correlation matrix of the variables.

	Eff	Indep	Bsize	Duality	Stateowned	Concent	Fsize	Leverage	Growthopp
Eff	1								
Indep	0.016	1							
Bsize	−0.158**	−0.393***	1						
Duality	−0.136**	0.104*	−0.128**	1					
Stateowned	0.265***	0.126**	0.035	−0.258***	1				
Concent	0.343***	0.321***	−0.210***	−0.184***	0.421***	1			
Fsize	0.121*	0.520***	−0.052	−0.095	0.161***	0.451***	1		
Leverage	−0.296***	0.313***	0.001	0.009	0.052	0.154**	0.478***	1	
Growthopp	0.055	−0.159**	−0.182***	0.140**	−0.207***	−0.170***	−0.416***	−0.361***	1

Notes: * indicates $p < 0.10$, ** indicates $p < 0.05$, *** indicates $p < 0.01$.

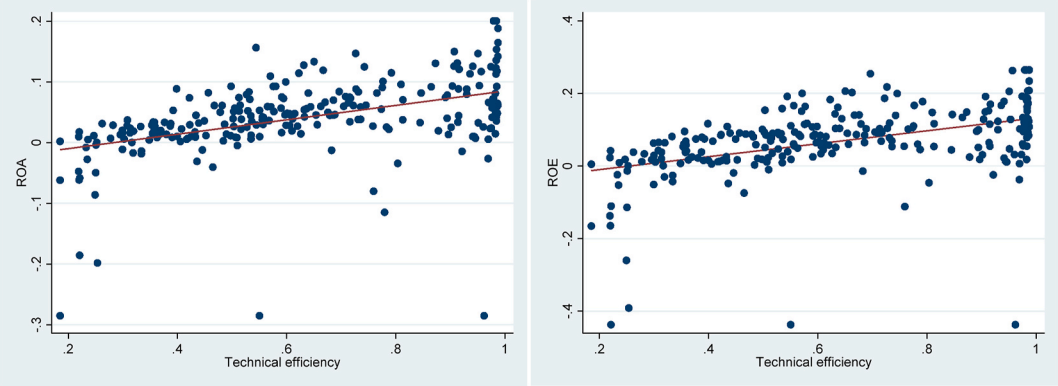

Fig. 2. Technical efficiency and financial performance scatterplot.

hand effect is more manifested, conducive to firms obtaining essential resources to promote their financial performance.

Concerning the ownership concentration, we find a significantly positive relationship between the change in ownership concentration and firm performance in Model 1. In contrast, it is not statistically significant in Model 2. Thus, a higher ownership concentration improves financial performance. This result partially supports the monitoring hypothesis but rejects the strategic alignment hypothesis. This is mainly because the professional capabilities of corporate governance, management and supervision possessed by these major shareholders are conducive to promoting performance, and the synergies associated with introducing blockholders outweigh the benefits of a decentralized ownership structure.

We examine that firm size, and growth opportunity are positively related to financial performance; however, this result is only significant in Model 2. Therefore, we can conclude that large firms that hold good growth opportunities are more able to generate financial performance. Finally, the results show a significant negative relation between leverage and financial performance, supporting the pecking order theory but opposing the leverage-signaling theory.

Finally, the results of the Durbin-Wu-Hausman test demonstrate that the residuals of the governance and efficiency variables are insignificant at the level of 0.1, indicating there are no endogeneity problems in our models. Hence, our models are more appropriate than the 2SLS models.

4.3. Further research for exploring the mediating effect of technical efficiency

This study adopted the three-step method to analyze the mediating effect of technical efficiency on the relations among the above five governance variables and financial performance to explore the mediating relationship proposed in H1b. The results are reported in Table 5.

Table 5 shows that technical efficiency mediates the relationship between board independence and financial performance. As shown in Model 3 and Model 4, the independent variable of board independence has a negative significant effect on *ROA* ($\beta = -0.147$, $p < 0.01$) and *ROE* ($\beta = -0.178$, $p < 0.05$), respectively. Moreover, board independence negatively affects the mediator of technical efficiency ($\beta = -0.552$, $p < 0.1$) in model 5. Finally, Model 6 and Model 7 introduce the mediator. Model 6 and Model 7 indicate that the effect of board independence on *ROA* and *ROE* becomes substantially smaller ($\beta = -0.102$, $p < 0.05$; $\beta = -0.106$, $p < 0.1$). This finding manifests that technical efficiency has a partial mediation effect between board independence and *ROA* ($a \times b = -0.045$) and *ROE* ($a \times b = -0.070$). The bootstrap test further confirms that technical efficiency mediates the relationship between board independence and *ROA* and *ROE*, with a 95% confidence interval excluding zero (−0.082, −0.001; −0.028, −0.011).

Table 5 shows that technical efficiency mediates the relationship between ownership concentration and financial performance. As shown in Model 3 and Model 4, ownership concentration has a significantly positive effect on *ROA* ($\beta = 0.003$, $p < 0.01$) and *ROE* ($\beta = 0.003$, $p < 0.01$), respectively. Meanwhile, ownership concentration has a positive significant effect on the mediator of technical efficiency ($\beta = 0.011$, $p < 0.05$) in Model 5. Finally, Model 6 and Model 7 introduce the mediator of technical efficiency. Model 6 suggests that the effect of ownership concentration on *ROA* becomes substantially smaller ($\beta = 0.002$, $p < 0.05$), whereas the relation between ownership concentration and *ROE,* is decreased and becomes insignificant ($\beta = 0.002$, $p > 0.1$) in Model 7. This result indicates that technical efficiency has a partial mediation effect of 0.001 between ownership concentration and *ROA* and a full

Table 5
Estimation results of the mediating effect of technical efficiency.

	Model 3 (DV = *ROA*)	Model 4 (DV = *ROE*)	Model 5 (DV = *Eff*)	Model 6 (DV = *ROA*)	Model 7 (DV = *ROE*)
Indep	−0.147*** (0.046)	−0.178** (0.069)	−0.552* (0.276)	−0.102** (0.038)	−0.106* (0.056)
Concent	0.003*** (0.001)	0.003*** (0.001)	0.011** (0.004)	0.002** (0.001)	0.002 (0.001)
Eff (mediator)				0.080* (0.041)	0.127*** (0.041)
Bsize	−0.003 (0.002)	−0.004 (0.003)	−0.003 (0.013)	−0.003 (0.003)	−0.003 (0.003)
Duality	−0.022 (0.016)	−0.029 (0.032)	0.055 (0.037)	−0.027 (0.018)	−0.036 (0.033)
Stateowned	0.039 (0.032)	0.017 (0.017)	0.088* (0.050)	0.032 (0.029)	0.006 (0.013)
Fsize	0.032** (0.015)	0.065*** (0.022)	0.033 (0.072)	0.029 (0.019)	0.062** (0.026)
Leverage	−0.034*** (0.011)	−0.050** (0.021)	−0.105**(0.042)	−0.025* (0.012)	−0.038* (0.021)
Growthopp	0.003 (0.005)	0.014*** (0.005)	0.021 (0.015)	0.001 (0.005)	0.012** (0.005)
Constant	−0.663* (0.334)	−1.316*** (0.470)	−0.311 (1.617)	−0.638 (0.404)	−1.286** (0.544)
Groups	26	26	26	26	26
Observations	258	255	258	258	255
Within R^2	0.271	0.240	0.194	0.322	0.293
Between R^2	0.295	0.431	0.290	0.381	0.535
Overall R^2	0.234	0.313	0.244	0.307	0.396

Notes: Standard errors are robust and reported in parentheses; * indicates p < 0.10, ** indicates p < 0.05, *** indicates p < 0.01.

mediation effect of 0.001 between ownership concentration and *ROE*. The bootstrap test also confirms that technical efficiency mediates the influence of ownership concentration on *ROA* and *ROE*, with a 95% confidence interval excluding zero (0.000, 0.001; 0.000, 0.001).

Overall, in Chinese culture, independent directors cannot effectively play the role of supervision and advice, which is not conducive to improving the technical efficiency of the production process and ultimately leads to weakening the financial performance. On the contrary, the professional capabilities of corporate governance, management, and supervision possessed by the major shareholders are conducive to promoting technical efficiency and ultimately transmitting and promoting financial performance. These results provide partial support for Hypothesis 1 b.

5. Discussion and conclusion

Based on the panel data of Chinese listed tourism firms, this study provides empirical evidence regarding the relationships among corporate governance, technical efficiency, and financial performance. It is the first study to explore such relationships in the tourism industry. The results indicate a positive linear relationship between technical efficiency and financial performance and substantiate the mediating effect of technical efficiency on the interconnectedness of board independence, ownership concentration, and financial performance. The results have important theoretical and practical significance for studying the governance-performance relationship and the advancement of the Chinese listed tourism firms.

5.1. Theoretical implications

First, this study measures the technical efficiency of Chinese listed tourism firms and examines the impact of technical efficiency on financial performance. As referred from the literature review, although there are abundant studies investigated the technical efficiency (Oukil et al., 2016; Yang, Xia, & Cheng, 2017) and the governance-performance relationship (Wang et al., 2014; Yeh & Trejos, 2013). Yet, little attention has been dedicated to uncovering the relationship between technical efficiency and financial performance. The results of the SFA models indicate that the Chinese listed tourism firms are comparatively inefficient and have considerable differences in their features. Meanwhile, the empirical results of the fixed effects panel data models indicate a positive linear relationship between technical efficiency and financial performance. This result echoes the point addressed by Ben Aissa and Goaied (2016) and further demonstrates the critical role of "operational" technical efficiency in improving the "ultimate" financial performance.

Second, based on the contingency corporate governance model that governance structures tend to vary across countries and industries; this study provides empirical evidence of the governance-performance relationship under the context of Chinese listed tourism firms. Our research identifies cross-cultural differences in corporate governance practices and generates more accurate results contrasting from previous studies. Specifically, different from the principles outlined in most of the guidelines (OECD, 2016a), board independence has a significantly negative impact on financial performance. Reasons behind the negative interrelation arise from various inducements. For instance, independent directors have the disadvantages of information asymmetry, unacquainted operational experience, and deficient firm-specific knowledge compared with inside directors. Moreover, the difficulties of independent directors to persistently deploying their supervisory functions in Chinese listed tourism firms are extremely burdensome since the rules of nomination and election often shackle independent directors. The Chinese specific cultural context is embodied in *guanxi*, *face*, *Confucianism*, and *collectivism*. Hence, the independent directors are reluctant to elicit their opposition against different stances to maintain good *guanxi* with inside directors while saving *face* simultaneously (Li & Hao, 2015; Yang, 2009). Board size and CEO duality negatively but insignificantly influenced financial performance, suggesting that the low-efficiency problem caused by the large board and CEO duality offset its effect of improving performance. In contrast to the previous research results, state ownership and ownership concentration are the representative attributes of Chinese listed tourism firms. Both attributes positively boost financial performance and can be utilized as functional governance tools. The result echoes the basic principle of the contingency corporate governance model (Oehmichen et al., 2016) and enriches the empirical evidence of the governance-performance relationship in the tourism literature. Besides, the result is supported by the "putting progress in its place" argument in geography (Livingstone, 2006).

Third, contrasting from the long-established governance-performance analysis framework employed in previous studies; this study integrates technical efficiency into the analysis framework of the governance-performance relationship for exploring the contribution of the technical efficiency with reference to the governance-performance relationship. The results support the mediating effect of technical efficiency on the interconnectedness of board independence, ownership concentration, and financial performance. This finding substantiates the analysis framework of "corporate governance-technical efficiency-financial performance," which firmly fills the gap in the literature on governance, efficiency, and accounting and finance.

5.2. Practical implications

The results also provide several important practical implications. First, administrators necessitate attention deployed on improving financial performance by enhancing the technical efficiency of enterprises since technical efficiency has a significant positive impact on financial performance, especially to Chinese listed tourism firms that are comparatively inefficient as to operational proficiencies. In this sense, administrators should improve their employee qualifications, optimize the allocation of inputs among different departments, reduce the proportion of independent directors on the board, and reduce firm leverage since they significantly impact efficiency.

Second, Chinese listed tourism firms should not rashly emulate after the governance model originated from other economies but should precisely place the governance progress in the Chinese culture and business context. While the China Securities Regulatory Commission has legally defined that the independent directors shall bear the duties of good faith and due diligence (CSRC, 2001). However, the independent directors are rather reluctant in eliciting their opposition to maintain good *guanxi* and to save *face* with insider directors under the Chinese specific cultural context (Li & Hao, 2015). Philosophies of *guanxi* and *face* might harm the effectiveness of board independence. Therefore, independent directors should not spontaneously shackle themselves in the predicament of law and Chinese philosophy. The regulators and policymakers should further enhance the independence of independent directors and their ability to perform their duties through legal procedures and practical measures. Moreover, the detachment of the CEO and the board's chairman should be encouraged to boost financial performance for a small board that does not exceed the capacity of 8 or 9 members (Jensen, 1993; Lipton & Lorsch, 1992). It is worth noting that the state's mixed ownership is a good governance tool in this context mentioned above. The government's leverage on enterprises is conducive to promote financial performance despite fiercely competitive market conditions. Further introduction of institutional investors, foreign investors, and mutual funds that constitute a vital stake is also an essential direction of ownership reform of Chinese listed tourism firms. Large firms that hold low leverage and good growth opportunities, to some extent, should also be encouraged to generate financial performance.

Finally, good performance is not achieved overnight. The managers should scrutinize the mediating role of technical efficiency in corporate governance (i.e., board independence and ownership concentration)

and financial performance for enterprises' overall prospects and performance meticulously.

6. Limitations and further research suggestions

Regarding this study's limitations, the enlightenments for future research are also generated subsequently. First, this study has some limitations related to the small sample size and efficiency evaluation indicator included in the analysis like other empirical studies in the tourism sector. These limitations can be attributed to the low number of listed tourism firms in the stock exchanges and poor data availability and quality. Specifically, our study mainly selects the listed firms on the mainboard and small and medium-sized boards. Although our sample represents the overall situation of Chinese listed tourism firms, more firms are listed on the growth enterprises market. Where data availability permits, the future study needs to be extended to these samples to yield more robust results. Meanwhile, the DEA and SFA models can also be duly combined to maneuver the input, output, and contextual variables in a hybrid model simultaneously (Oukil & Al-Zidi, 2018). Second, our study aims to investigate the governance-performance relationship under the Chinese context. Although it can provide insights into local corporate governance and performance improvements, the universality of the conclusion is limited. Hence, more cross-cultural comparative studies are needed. Third, the demand for investigating other governance mechanisms and external factors while considering their interaction effects is highly valued. Finally, future research should consider a more extensive measurement of performance indicators (e.g., competitiveness, eco-efficiency, and sustainable performance).

Declaration of competing interest

The authors declare no conflict of interest.

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Appendix A

Abbreviation	Term	Abbreviation	Term
SOEs	State-owned enterprises	Eff	Technical efficiency
CEO	Chief executive officer	Indep	Board independence
SFA	Stochastic frontier analysis	Bsize	Board size
DEA	Data envelopment analysis	Duality	CEO duality
ROA	Returns on asset	Stateowned	State ownership
ROE	Returns on equity	Concent	Ownership concentration
Lnincome	Natural logarithm of income	Fsize	Firm size
Lnlabor	Natural logarithm of labor	Growthopp	Growth opportunity
Lncapital	Natural logarithm of capital	ST/*ST	Special treatment

Appendix B. Listed tourism firms in China

Firm name	Listing type	Listing time
Shenzhen Overseas Chinese Town Co., Ltd	Main board of Shenzhen Stock Exchange	1997
Huatian Hotel Group Co., Ltd	Main board of Shenzhen Stock Exchange	1996
Zhang Jia Jie Tourism Group Co., Ltd	Main board of Shenzhen Stock Exchange	1996
Guangzhou Lingnan Group Holdings Company Ltd	Main board of Shenzhen Stock Exchange	1993
Xi'an Tourism Co., Ltd	Main board of Shenzhen Stock Exchange	1996
Xi'an Catering Co., Ltd	Main board of Shenzhen Stock Exchange	1997
Caissa Tosun Development Co., Ltd	Main board of Shenzhen Stock Exchange	1997
Beijing Jingxi Culture & Tourism Co., Ltd	Main board of Shenzhen Stock Exchange	1998
Emeishan Tourism Company Ltd	Main board of Shenzhen Stock Exchange	1997
Guilin Tourism Co., Ltd	Main board of Shenzhen Stock Exchange	2000
Lijiang Yulong Tourism Co., Ltd	Small and medium-sized board of Shenzhen Stock Exchange	2004
Yunnan Tourism Co., Ltd	Small and medium-sized board of Shenzhen Stock Exchange	2006
Wuhan Sante Cableway Group Co., Ltd	Small and medium-sized board of Shenzhen Stock Exchange	2007
China Quanjude (Group) Co., Ltd	Small and medium-sized board of Shenzhen Stock Exchange	2007
Songcheng Performance Development Co., Ltd	Growth enterprises market of Shenzhen Stock Exchange	2010
Huangshan Tourism Development Co., Ltd	Main board of Shanghai Stock Exchange	1997
China CYTS Tours Holding Co., Ltd	Main board of Shanghai Stock Exchange	1997
BTG Hotels (Group) Co., Ltd	Main board of Shanghai Stock Exchange	2000
China United Travel Co., Ltd	Main board of Shanghai Stock Exchange	2000
Dalian Sunasia Tourism Holding Co., Ltd	Main board of Shanghai Stock Exchange	2002
Besttone Holding Co., Ltd	Main board of Shanghai Stock Exchange	1993
Xi'an Qujiang Cultural Tourism Co., Ltd	Main board of Shanghai Stock Exchange	1996
Tibet Tourism Co., Ltd	Main board of Shanghai Stock Exchange	1996
Shanghai Jin Jiang International Hotels Co., Ltd	Main board of Shanghai Stock Exchange	1996
Jinling Hotel Co., Ltd	Main board of Shanghai Stock Exchange	2007
China Tourism Group Duty Free Co., Ltd	Main board of Shanghai Stock Exchange	2009

Note: All samples and data are obtained from the Chinese Securities Market and Accounting Research Database.

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Hongsong Peng, PhD, is a researcher in the School of Business Administration, Tourism Industry Development Institute at Nanjing University of Finance and Economics (3# Wenyuan Road, Nanjing, Jiangsu, China. Email: penghongsongahsd@163.com). His research interest includes corporate governance, performance evaluation, and tourism economic and environmental impact. ORCID ID: http://orcid.org/0000-0002-4520-7078

Jinhe Zhang, PhD, is a Professor in the Department of Land Resources and Tourism Sciences at Nanjing University, China (Email: zhangjinhe@nju.edu.cn). His research interest includes tourism geography and tourism impact.

Shien Zhong, PhD, (corresponding author), is an Associate Professor in the School of Business Administration, Tourism Industry Development Institute at Nanjing University of Finance and Economics (3# Wenyuan Road, Nanjing, Jiangsu, China. Email: fgh1475@163.com). His research interests include corporate governance, theme park and heritage tourism.

Peizhe Li is finishing his Bachelor of Tourism Development and Management at the School of Community Resources of Arizona State University (Email: peizhel1@asu.edu). His research interests include climate adaptation planning for cultural resources, tourists' stress coping strategies and innovative methodologies for travel behaviors.