Optimal diversification and firm performance: the role of geographic diversification in China tourism firms

Abstract

The tourism literature examining the diversification-performance relationship is extensive but has not verified the moderating role of geographic diversification. As China is becoming the world's second largest economy with vast geographical area, it is imperative to determine the effect of geographic diversification strategy on *diversification- performance* link. The analysis is based on data from annual reports of China tourism corporations for the years 2008–2015. This study affirms an inverted U-shape relationship and suggests the optimal level of diversification. The results advocate that the combination of geographic and business segments diversification will enlarge the effect of market power on tourism firms.

Keywords: business segments diversification, geographic diversification, firm performance, tourism industry, strategy

1. Introduction

Diversification is a pervasive phenomenon in China tourism industry (Chen, 2014). Firms in tourism industry commonly operate businesses in various industries such as real estate, transportation, commodity trading, attraction operation and management, and landscape architecture. Most tourism firms in China gain revenue from a range of tourism-related activities, such as scenic spot ticketing sales, cable car transport service, travel agency service, accommodation, food and beverage service, and entertainment. Such strategy is called business

segments diversification strategy, which is deemed as beneficial to firm performance (Su & Tsang, 2015; Zheng & Tsai, 2019). However, the existing literature on China's tourism industry suggests contradictory findings of *diversification-performance* relationship. Pine and Phillips (2005) asserted that diversification strategy benefits performance of hotels in China, while Wang and Xu (2009) found significant relationship of *diversification-performance* among attraction sector but not in hotel sector. The resource sharing and resource utilization are essential to diversification strategies while operating diverse businesses across different business segments (Zheng & Tsai, 2019). Since Chinese tourism firms often have large amount of capital expenditure and fixed assets, it is worth to revisit the relationship between diversification and performance by identifying an optimal level of diversification. Therefore, this study addresses the existing discrepant conclusions of the relationship and extends the conversations of the impact of diversification with new empirical evidences based on the context of China's tourism industry.

Besides business segments diversification, geographic diversification is another important diversification strategy. There has been substantial empirical evidence of the relationship between geographic diversification and firm performance focusing on hotel sector. For example, Barney and Hesterly (2008) indicated that a hotel firm with geographic diversification can build a strong and dominant position in gaining a greater bargaining power. Kang and Lee (2014) stated that a greater portfolio effect can be caused via geographic diversification for firms in hotel sector than other sectors. Hence, geographic diversification strategy is critical for hotel firms which are normally highly affected by local contingency factors and seasonality. However, relatively fewer research efforts have been made to examine the diversification-performance in tourism sector. Even less is known about the effect of geographic diversification on China's tourism firm performance. Although Wang et al (2018) has examined the impact of geographic diversification

on Chinese tourism firm performance, domestic geographic diversification has rarely been studied in the context of China's tourism industry as a role of moderator in the link of business segments diversification and performance. Chinese tourism firms often operate their business in different provinces in China, thus it may be worth looking the impact of geographic diversification strategy within same institutional context.

Prior research asserted that considering product diversification and geographic diversification separately rather than simultaneously may blur the impact of a certain type of diversification strategy (Kang, 2011). A tourism product consists of five elements which are physical plant, freedom of choice, service, involvement and hospitality (Smith, 1994). Since the tourism-related business mainly provides intangible services and concentrates on the enhancement of guest experience, this study views a generic product diversification as business segments diversification which allows firms to operate diverse-related and unrelated businesses (Zheng & Tsai, 2019). Hillman (2015) has argued that merely considering one diversification strategy when the firm has two or more strategies is likely to bias the results of *diversification-performance* relationship. As such, this study is among the first to consider both business segments diversification and geographic diversification in affecting tourism firm performance. Specifically, this study addresses more than one type of diversification strategy by assessing the moderating effect of geographic diversification on the relationship between business segments diversification and firm performance. The findings of this research provide both theoretical insights and managerial insights into the way in which geographic diversification interacts with business segments diversification strategy and firm performance.

2. Literature Review

Diversification and firm performance

Hilman (2015) indicated that theories and perspectives (e.g., the views of the resource-based and market power) support product diversification as a useful corporate strategy. From the perspective of Resource Based Theory (RBT), diversification generates a synergy of economies of scale and scope through internalization where core resources for building competitive advantage can be well allocated, thereby improving firm performance (Li & Greenwood, 2004). The soundness of resource sharing is essential for adding value to business diversification strategies. Amit and Livnat (1988) suggest that diversification creates a synergy among different operations and reduces the probability of bankruptcy. For instance, a synergy can be built by sharing firm's tangible resources, common managerial and technological knowledge, its distinctive competitive advantages among business units, and leveraging them in new product areas (Tanriverdi & Venkatraman, 2005). Muzyrya (2010) found that costs of a firm can be reduced when the firm diversifies into new product markets because some of its transactions are internalized. Furthermore, many large firms increase the degree of product diversification as one of their sources of competitive advantage (Hoskisson & Hitt, 1990). Product diversification is also implemented as a strategy to escape from the industries with a poor profitability (Christensen & Montgomery, 1981). From the perspective of market power, diversified firms gain a competitive advantage over focused firms, and George (2007) proposed that the advantage can be gained through anticompetitive practices such as predatory pricing, mutual forbearance, and reciprocity.

In the hotel industry, business diversification is commonly implemented as a strategy to absorb demand externalities, share resources, and intra-firm knowledge, and reduce operational

costs (Lin & Liu, 2000). Yang et al. (2017) suggested that business diversification provides competitive advantages to hotel firms by leveraging their loyal guests who keep loyal with new products or services that are offered by same hotel firms. Gan and Hernandez (2012) stated that hotel firms with a high degree of diversification have the capability to charge a price premium and set a collusive pricing strategy to boost their room rates. Additionally, from the perspective of RBT, as tourism firms offer service-centric businesses mainly, employees can easily utilize their skills and knowledge gained from previous training for one service to new service when diverse businesses were operating (Yang et al., 2017). In short, business diversification in tourism firms will be beneficial based on the resources-sharing from the sources of loyal customers who recognize a brand, employees' tacit knowledge and relevant skills, and internal synergy. Therefore, the positive relationship between business segment diversification and firm performance is hypothesized.

In the meanwhile, some scholars proposed that the relationship between diversification and firm performance is non-linear (i.e. Park & Jang, 2012). From the perspective of transaction cost theory, Williamson (1981) asserted that transaction costs increase while a product or service is being transferred from one stage to another, in particular, new technological capabilities are required to produce new products or services. Jone and Hill (1988) hypothesized that business diversification may increase internal bureaucratic costs to a certain degree, which can lead to a gradual decrease of the firm performance. The increase of diversity of businesses may require an increase of experts in management and board of a company. The inefficient of management and use of core resources for creating a synergy due to a large scope of businesses can destroy the value of business diversification (Zheng &Tsai, 2019). Tallman and Li (1996) mentioned that while a firm expands its strategic resources, a failure appears once business scope exceeds the

resources and management scope and management capabilities. Grant, Jammine, and Thomas (1988) mentioned that the strain is growing on top management because they try to manage an increasingly disparate and less familiar portfolio of businesses. Markides (1995) identified a series of costs may appear once increasing the scope of product and operations, such as control and efforts losses, coordination costs, costs related to diseconomies, inefficiencies from conflicts across businesses, and internal capital market inefficiencies. Therefore, the non-linear relationship between business segments diversification and firm performance is proposed as the degree of business segments diversification is increased to a certain point, the benefits to firm performance reaching to a maximum, and then the benefits decreasing as costs are increased (Nachum, 2004). Based on the preceding arguments, we proposed the following hypothesis:

Hypothesis 1a: Business segments diversification positively influences firm performance.

Hypothesis 1b: The quadric business segments diversification negatively influences firm performance.

Moderating effect of geographic diversification

The definition of geographic diversification is that a firm operates its businesses in multiple geographic markets (Kang & Lee, 2014). In the hotel industry, Kang and Lee (2014) suggested that the geographic diversification helps hotel firms' access to different markets. From the view of market power generation, geographic diversification creates a conglomerate power across multiple markets and increases bargaining power, which in turn increases profit (Montgomery, 1994). Barney and Hesterly (2008) found that hotel firms with the high degree of geographic diversification can build a strong bargaining power and dominant position in a market. Furthermore, as the nature of the hotel industry is highly affected by the seasonality and the

sensitiveness of environment changes and local regulations (Barney & Hesterly, 2008), a great portfolio effect from geographic diversification can be gained by hotel firms than firms in other industries (Kang & Lee, 2014). Hence, the geographic diversification strategy is critical in mitigating the variance of return or risk by hotel firms which are highly affected by seasonality and local contingency factors.

Nevertheless, as business segments diversification creates a synergy among business units in a firm (Amit & Livnat, 1988), geographic diversification provides a great opportunity for the firm to achieve the synergy in different geographic locations (Kang & Lee, 2014). As business segment diversification serves as a strategy for firms to escape from an industry with a poor profitability (Christensen & Montgomery, 1981), a geographic diversification may assist the firms to enter a profitable industry at specific regions. In addition, from a marketing perspective, a firm can sell a hurdle of products to customers who are from different geographic locations along with a degree of geographic diversification increased (Varadarajan, DeFanti, & Busch, 2006). Furthermore, tourism firms can duplicate their business models in different geographic locations, for instance hotel chains open hotels in different geographic locations, which is good hedge against a risk of seasonality from other destinations, making revenue streams from different geographic branches. Therefore, a geographic diversification benefits a firm because a large diversity of business portfolio can satisfy heterogeneous customers' needs in different geographic regions with more options for marketing strategies (Kekre & Srinivasan, 1990). The learning experiences a firm gained from different geographic markets assists the firm to develop better business units for targeting markets and then to increase profitability (Kekre & Srinivasan, 1990; Varadarajan et al., 2006). Moreover, Chang and Wang (2007) indicated that a firm can gain a great profit stability and increased economies of scale and scope by a substantial number of shared resources and

interdependencies among its various businesses from an integration of product and geographic diversification. In short, a firm with geographic diversification has a better opportunity to create a synergy in different geographical locations and leads to a greater effect of business segments diversification on the firm performance than a firm without geographic diversification. That is, a firm with a higher degree of geographic diversification has a better understanding of different geographic markets to develop business units for targeting markets and leads to a greater effect of business segment diversification on the firm performance than a firm with a lower degree of geographic diversification. Accordingly, Hypothesis 2 is proposed as follows:

Hypothesis 2: Geographic diversification positively moderates the relationship between business segment diversification and firm performance.

3. Methodology

According to Wang and Xu (2009), two criteria were applied to select appropriated public-traded tourism firms for conducting this study, namely: first, firms operate businesses in the hotel industry (code H6110), tourism attraction operation (code N7852), and travel service-related industries (include the industries of code L7271, L7272, and L7279); second, firms gain the largest portion of revenue from the aforementioned industries. Selected firms are considered as tourism firms in this study. Furthermore, the financial data of all the firms used in this study are from the Sina and Sohu Finance websites which provide online financial news and stock trading information and collect annual reports from all traded firms in China, a total of 26 tourism firms has traded in the main boards of Shanghai Stock Exchange (SHEX) and Shenzhen Stock Exchange (SZEX), including hotel, travel service, and tourism attraction operating firms. All publicly listed tourism

and hospitality firms in the Chinese stock exchanges (SZEX and SHEX) were selected for this study in 2018. Data were collected from the 2008–2015 annual reports of the selected firms. Two performance measures—return on assets (ROA) and Tobin's Q—were the dependent variables in the estimation models; business segment diversification, geographic diversification, were the independent variables. Additionally, firm size, firm age, debt ratio, and capital intensity acted as the control variables in the estimation models.

Dependent Variables

A number of scholars (e.g., Jayaraman & Milbourn, 2011; Kang & Jang, 2014) affirmed that Tobin's Q can provide an unbiased estimation of the present value of a firm's future cash flow over the replacement cost of total assets, which is an appropriate measure of firm performance at a point in time. Whereas, ROA as a traditional accounting-based measure of firm performance provides a historical measure that may contain information which is valuable for the evaluation of firm performance and beyond what includes in stock returns (Zheng, Li, & Wu, 2021). An accounting-based measure of firm performance such as ROA can compensate for a market-based measure such as Tobin's Q while investors' estimations of future cash flows and macroeconomic factors may influence directly on the market-based measure of firm performance. Such that, an accounting measure of firm performance such as ROA is more apparent to reflect a firm's return (Zheng et al., 2021). Therefore, ROA and Tobin's Q were used to evaluate firm performance in this study.

$$\mathrm{ROA}_{\mathrm{it}} = \text{Net Income}_{\mathrm{it}}/(\text{Total Assets}_{\mathrm{it}} + \text{Total Assets}_{\mathrm{it-1}})/2$$

Net income of a firm *i* at time *t*, and $(\text{Total Assets}_{\mathrm{it}} + \text{Total Assets}_{\mathrm{it-1}})/2$ is the average value of the assets at beginning period *t-1* and at ending period *t* of the firm *i*.

$$\text{Tobin's } Q_{it} = (MV_{it} + PS_{it} + Debt_{it})/BV_{it}$$

Tobin's Q is calculated as the sum of MV_{it} (a firm *i* 's time t's stock price multiplies the number of common shares Outstanding), PS_{it} (is the liquidating value of the outstanding preferred stock of the firm *i* at time *t*), and $Debt_{it}$ (is the firm *i*'s value of short-term liabilities net of short-term assets plus the book value of long-term debt at time *t)* dividing by BV_{it} (is the book value of total assets of firm *i at* time *t*). The natural logarithmic form of the Tobin's Q was used in the models (e.g. Park & Jang, 2013).

Independent Variables

This study applied entropy index to measure diversification in accordance with Jacquemin and Berry (1979)'s pioneering work. This measurement is advanced as it involves the number of industries in which a firm operates its businesses, the proportion of total firm revenues of each business unit, and the degree of relatedness (Wang & Xu, 2009). The degree of diversification was measured by using the entropy index (Chang & Wang, 2007; Zheng & Tsai, 2019)

$$\text{BD}_{\text{it}} = \sum_{j=1}^{n} S_j \ln(1/S_j)$$

BD_{it} is the Entropy index used widely from the existing diversification studies (e.g., Kang & Lee, 2014; Zheng & Tsai, 2019), measuring the level of business segments diversification in a firm i at time t; sj is the proportion of jth business segment of the total revenue of tourism firm i, and n is the total number of business segments in tourism firm i.

Control Variables

Firm size, firm age, leverage, capital intensity, and paying a dividend are commonly executed as the control variables in investigating the relationship between diversification strategy and firm performance (Chang & Wang, 2007; Kang & Lee, 2014; Mahoney, 1992; Park & Jang, 2012). Firm size is measured by the natural logarithm of a firm's total number of employees to control the effects of company's scale on firm performance (Zheng & Tsai, 2019). Kang and Lee (2014) pointed out that the excessive skewness of firm size can be adjusted by using the natural logarithm form. Furthermore, Mahoney (1992) mentioned that older firms may be more experienced than younger firms so that they may have a better performance than younger firms. Therefore, according to Banalieva and Sarathy (2011)'s study, the firm age is used to control the learning effects that may influence decision-making and firm performance. Moreover, the leverage reflects the capital structure of a firm; it is used to control the benefit that a firm may gain from the tax shield effect of a debt usage on firm performance (Kang et al., 2011). Based on Kang et al. (2011)'s study, the debt ratio was used to control the taxshield effect and the potential effect that capital structure influencing financial viability in this study. In addition, Bettis (1981) stated that capital intensity varies across different industries. Port (1981) suggested that capital intensity may be a barrier to exit an industry because the great degree of capital intensity may confront business risk caused by convertibility and liquidity. Therefore, different levels of capital intensity in different firms may be associated with the differences in firm profitability. Lastly, paying dividend basically reflects the stability of a firm's future cash flow (Ferreira & Vilela, 2004) and Easterbrook (1984) indicated that dividends can reduce firms' over-investment problems, which, in turn, influences firm performance.

Models

The following equation (1) was used to test the Hypothesis 1a that hypothesized the positive effect of business segments diversification on firm performance in a linear relationship. Additionally, the equation (2) was used to test the Hypothesis 1b that hypothesized the negative effect of quadric business segments diversification on firm performance in a nonlinear relationship.

$$P_{i,t} = \beta_0 + \beta_1 BD_{i,t} + \sum_{n=1}^{4} \gamma_n Z_{i,t,n} + \varepsilon_{i,t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

$$P_{i,t} = \beta_0 + \beta_1 BD_{i,t} + \beta_2 BD_{i.t}^2 + \sum_{n=1}^{4} \gamma_n Z_{i,t,n} + \varepsilon_{i,t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

The following equations (3) and (4) were used to test the Hypothesis 2 which hypothesized that geographic diversification positively moderates the relationship between product diversification and firm performance. The equations (3) and (4) tested the effect of product diversification on firm performance in both linear and nonlinear relationships in two subgroups of firms with geographic diversification and without geographic diversification.

$$P_{i,t} = \beta_0 + \beta_1 BD_{i,t} + \beta_2 Dummy\_GD_{i,t} + \sum_{n=1}^{4} \gamma_n Z_{i,t,n} \dots\dots\dots\dots\dots\dots\dots (3)$$

$$P_{i,t} = \beta_0 + \beta_1 BD_{i,t} + \beta_2 BD_{i.t}^2 + \beta_3 Dummy\_GD_{i,t} + \sum_{n=1}^{4} \gamma_n Z_{i,t,n} + \varepsilon_{i,t} \dots (4)$$

Where:

$P_{i,t}$ is firm *i* 's performance indicator at time *t*.

$BD_{i,t}$ is the business segment diversification of firm *i* at time *t*.

$Dummy\_GD_{i,t}$ is the geographic diversification of firm *i* at time *t*, which is measured as a dummy variable; one if a firm operates its businesses in more than one province; zero if a firm operates its businesses within only one province.

$Z_{i,t,1}, \ldots, Z_{i,t,4}$ are four control variables: firm size, firm age, debt ratio, and capital intensity, which control for the effects on firm performance. γ is the coefficient of a control variable. $\varepsilon_{i,t}$ is the error term.

(i =1, 2…, 26; t=1, 2…, 8)

Estimation Method

First of all, the different tests conducted to ensure estimation assumptions satisfied for a panel regression were introduced. To test the estimation assumptions whether can be satisfied for panel regressions (the existence of unit-root, serial correlation, and heteroscedasticity) is also crucial to ensure the reliability of later estimations. Secondly, the different assumptions were introduced to select an appropriate panel model estimation method (i.e. pooled ordinary least squares, fixed and random effect methods). The Hausman test was conducted to determine the more efficient and consistent model between using fixed effects and random effects methods. Thirdly, to use the Two Stage Least Square (2SLS) to solve the endogeneity problem, the instrumental variables were used. Kistruck, Qureshi, and Beamish (2013) used other two instrumental variables for solving a potential issue of endogeneity of product diversification, which was board size and quick ratio. Firstly, the logic for the selection of board size is that a larger number of board members are more likely to have a greater diversity of business interests. Therefore, the more board members in influential positions increase the likelihood of diversification into different businesses. Secondly, the quick ratio reflects a short-term picture of meeting the short-term obligation. It affects the likelihood of diversification for a firm if the firm has a risk of bankruptcy. This measure of short-term liquidity should be related to the long-term impacts of diversifying into new products (Kistruck et al. 2013).

Measuring moderating effects of geographic diversification

Arnold (1982) suggested that using subgroups is an alternative strategy to test whether parameters differ across groups to capture the moderating effect. An "interaction term" is measuring a joined influence of two variables, therefore, there is a limitation to focus on one of two variables as a moderator (Arnold, 1982). The focus of moderating effect of this study is associated with geographic diversification solely, hence, an "interaction term" between business segments diversification and geographic diversification was not used due to their joined influences on performance. To test the hypotheses 2, subgroups were used to capture the moderating effects of geographic diversification. One panel regression model was operated in two subgroups separately. There were three steps performed accordingly. At the first step, the T-test (mean-comparison test) was conducted for dependent variables, two measures (ROA and Tobin's Q) of firm performance, across two subgroups. The second step was to compare estimates of models which were separately operated in two subgroups via the Hausman test which detects the difference in coefficients between two regressions. The third step was to detect the equality of coefficients of business segments diversification variable specifically in two models across two subgroups. Clogg, Petkova, and Haritou (1995) introduced a method to compare coefficients of regression, Z statistic shown as follow:

$$\text{Z statistic} = (\beta 1 - \beta 2)/\sqrt{SE_{\beta 1}^2 + SE_{\beta 2}^2}$$

(Clogg et al., 1995, p. 1276).

Where, $\beta 1$ is the coefficients of business segments diversification measure in one model operated in one subgroup, $\beta 2$is the coefficients of the business segments diversification measure in another model operated in another subgroup, SE is a standard error. The significant Z statistic

indicated that there is a significant difference between the coefficient of business segment diversification in one subgroup and the coefficient of business segments diversification in another subgroup. The hypothesized moderating effect via subgroup method was captured statistically by comparing panel regression models and specific coefficients of business segments diversification across subgroups.

4. Results

Descriptive statistics

Table 1 provides an overview of continuous variables for the analyses of the sampled Chinese tourism firms. *ROA* ranged from −0.226 to 0.268 with a mean of 0.049 and a standard deviation of 0.064. *Tobin's Q* varied from 0.105 to 3.094 with a mean of 1.008 and a standard deviation of 0.601. Business segments diversification varied from 0 to 2.293 with a mean of 0.997 and a standard deviation of 0.482. For the control variables, the natural logarithmic form of the total number of employees of firms ranged from 5.024 to 9.521. The logarithmic form of firm age ranged from 0.693 to 3.296, and the debt ratio had minimum and maximum values of 0.024 and 1.309, respectively. The reason why debt ratio exceeded 1 was that a few firms suffered from unprofitable situations in certain years. The negative retained earnings may have resulted in the negative equity of the firms. To keep their businesses operating, the level of leverage may have increased rapidly, leading to insolvency in those years. Admati et al. (2018) highlighted another reason why debt ratio may be greater than one was that the business is located in a highly cyclical industry where cash flows were affected suddenly to decline. The scale of capital intensity ranged from 0.003 to 0.916.

[Table 1 and 2 near here]

Table 2 presents the bivariate correlations of all included variables in regression analyses of the sampled Chinese tourism firms. *ROA* and *Tobin's Q* were correlated negatively but not significantly with each other, which indicated that the market-based performance measure was not significantly related to profitability. Business segments diversification and *ROA*, and *ROA* and *SIZE* were positively and significantly correlated at the 1% significance level. By contrast, *ROA* was negatively and significantly related to the logarithmic form of firm age (*AGE*) and debt ratio (*DEBT*) at the 1% significance level. Capital intensity (*CI*) was negatively and significantly associated with *ROA* at the 1% significance level. The financial market-based performance measure, *Tobin's Q*, was negatively and significantly related to product diversification (*PD*) at the 5% significance level. A negative and significant correlation was found between *Tobin's Q* and *SIZE*. *DEBT* was not related to *Tobin's Q*, but *CI* was positively and significantly related to *Tobin's Q* at the 1% significance level.

Effect of product diversification on firm performance

The models (1) and (2) which investigated the effect of business segments diversification on firm performance (i.e., *ROA* and *Tobin's Q*), did not consider the possible issue of endogeneity. Business segments diversification (*BD*) was hypothesized as an endogenous variable in many previous studies because firm-level characteristics are expected to affect decisions on diversification and subsequent firm performance to some extent (e.g., Kang & Lee, 2014; Tran & Zaninotto, 2010). The Durbin–Wu–Hausman tests were conducted for models (1) and (2) to test whether the issue of endogeneity exists in the models. The results of the test indicated rejections of null hypotheses that variables are exogenous in models one and two. The endogeneity was significate in the models (1) (F value = 6.915, p-value = 0.009) and (2) (F value = 12.446, p-

value = 0.000). Therefore, this study conducted fixed effects instrumental variable estimations (models (3) and (4)) to mitigate the endogeneity.

[Table 3 near here]

The results of panel regression in Table 3 reveal that *ROA* and *Tobin's Q* were significantly related to business segments diversification in the fixed effects estimations and fixed effects instrumental variable estimations. The coefficients of business segments diversification were positive and statistically significant at the 5% significance level, suggesting that the degree of business segments diversification positively influenced firm performance regardless of the performance measurements. The coefficient of business segments diversification in the models (1) and (2) indicated that when business segments diversification is changed by one, *ROA* is expected to change by 0.041; when product diversification is changed by one, *Tobin's Q* is expected to change by 19%.

The validity of instrumental variables can be assessed based on the results of Anderson canonical correlation test and Sargan test for the model (3) and (4). The results of Anderson canonical correlation test indicated that the instrumental variables are relevant, meaning correlated with product diversification, endogenous variable. The results of Sargan test implied that the null hypotheses with instrumental variables valid were not rejected.

The coefficient of business segments diversification in the models (3) and (4) under the consideration of the issue of endogeneity indicated that when business segments diversification is changed by one, *ROA* is expected to change by 0.418; when business segments diversification is changed by one, *Tobin's Q* is expected to change by 132%. Among the coefficients of the model

(1), *DEBT* was negative and statistically significant at the 1% level, which meant that when *DEBT* is increased by one, *ROA* is expected to decrease by 0.145. The models (2), (3), and (4) indicated that *SIZE* was negative and statistically related to *ROA* and *Tobin's Q*, which implied that the larger firm size tends to worsen firm performance in China. The overall explanatory powers (R-squared value) of these independent variables on the dependent variable in the models (1) and (2) were 29.2% and 57.9%, respectively. The R-squared values of models (3) and (4) (FE-2SLS models) are not reported in Table 4.4 because the models' residuals were calculated and affected by the added instrumental variables, which did not indicate the actual regressors (Kang & Lee, 2014).

[Table 4 near here]

The coefficient of business segments diversification was positive and statistically significant at the 5% level in the model (5) in Table 4, suggesting that the degree of business segments diversification positively influenced firm performance (*ROA*). The quadric business segments diversification was negative and statistically significant at the 5% level, which indicated a nonlinear relationship between business segments diversification and *ROA*. The hypothesized standpoint that the degree of business segments diversification up to a certain level leads to maximum *ROA* was supported by the model (5). Moreover, the coefficient of *DEBT* in the model (5) was negative and significant at the 1% level and was consistent with that of the model (1). By taking the first derivatives of *ROA* and *Tobin's Q* with respect to business segments diversification for the results of Models (5) and (6), the optimal points of diversification are as follows:

$$\frac{\partial ROA}{\partial BD} = 0.099 - 2 \times 0.04 \times BD = 0;\ PD \approx 1.24.$$

$$\frac{\partial\, Tobin's\ Q}{\partial BD} = 0.909 - 2 \times 0.295 \times BD = 0;\ BD \approx 1.54.$$

Moderating effect of geographic diversification

This section illustrates the results referring to the second hypothesis that geographic diversification positively moderates the relationship between business segments diversification and firm performance. The moderating effect of geographic diversification was examined through estimations based on two subgroups. One group comprised firms that operate businesses in other provinces in China and implement a geographic diversification strategy, and the other group comprised firms that have no business in other provinces in China and have no geographic diversification strategy. Table 5 presents the T-test results of *ROA* and *Tobin's Q* in the two subgroups. *Tobin's Q* differed significantly between the two subgroups at the 1% level. In other words, the effect of geographic diversification on *Tobin's Q*, if any, differed in the two subgroups. However, *ROA* was insignificantly different between the two subgroups, which meant the effect of geographic diversification on *ROA* was not different.

[Table 5 near here]

Panel regression estimations were conducted (results are shown in Table 6) to further investigate the moderating effect of geographic diversification on the relationship between business segments diversification and firm performance. The results of the Durbin–Wu–Hausman test for the model (7) (F=2.895, p-value=0.192) indicated that there was no endogeneity and the null hypothesis that all variables are exogenous was not rejected.

[Table 6 near here]

In the group of firms that implement a geographic diversification strategy, the result of the model (7) revealed that the coefficient of business segments diversification was positive and statistically significant at the 1% level, suggesting that an increase in business segments diversification increases *Tobin's Q* for geographically diversified Chinese tourism firms. The model (7) also indicated that if Chinese tourism firms implementing geographic diversification increase their entropy index in measuring business segments diversification by one, their *Tobin's Q* values would increase by 43.1%. The coefficient of *SIZE* was negative and statistically significant at the 1% level, which implies that firm size tends to corrode firm performance in regard to *Tobin's Q* value. However, the coefficient of *CI* was positive and statistically significant at the 5% level, which implies that an increase in *CI* results in an increase in *Tobin's Q*. Among the coefficients of the model (7), *SIZE* and *CI* were negative and statistically significant at the 1% level and positive and statistically significant at the 5% level, respectively. The overall explanatory power (R-squared value) of these independent variables on the dependent variable in the models (7) and (8) was 63.4% and 53.1%, respectively.

The moderating effect of geographic diversification on the relationship between *PD* and *Tobin's Q* was examined by testing if a significant difference exists between the models (7) and (8) and between the coefficients of *PD* in the models (7) and (8). The Hausman test was conducted to compare the coefficients of the two models holistically. The differences in coefficients between the models (7) and (8) were significant at the 1% level (Chi-Square=94.30, p-value<0.01), which indicated that the effects of geographic diversification in the two subgroups led to significantly different estimations. Furthermore, the Z statistic was calculated under the null hypothesis of equality of coefficients in the two models to compare the coefficients of *PD* in the two models

(Clogg et al., 1995). The significant Z[1] statistic indicated that the null hypothesis was rejected (Z=2.00, p-value<0.05). In conclusion, geographic diversification can positively moderate the relationship between business segments diversification and *Tobin's Q*.

[Table 7 near here]

The result of the model (9) revealed that the coefficient of quadric business segments diversification was negative and statistically significant at the 5% level in Table 7. The inverted U-shape relationship between *Tobin's Q* and business segments diversification was well supported in the group of firms that have a geographic diversification strategy. By contrast, the inverted U-shape relationship between *Tobin's Q* and business segments diversification was not supported in the group of firms that did not have a geographic diversification. Statistically, the result of Hausman test to compare the models (9) and (10) in the Table 7 indicated that there were no significant differences between two models' coefficients. Additionally, there was no significant difference between the coefficients of quadric business segments diversification in those two models. Therefore, although the inverted U-shape relationship between *Tobin's Q* and business segments diversification was supported in the group of firms with a geographic diversification, it was not supported in the group of firms without a geographic diversification. The moderating effect of geographic diversification on the inverted U-shape relationship between *Tobin's Q* and business segments diversification was not supported.

[1] Z statistic = $(\beta_1 - \beta_2)/\sqrt{(SE_{\beta 1}^2 + SE_{\beta 2}^2)}$, SE = standard error (Clogg et al., 1995, p. 1276).

5. Discussions

The positive effect of business segments diversification on firm performance can be explained by resource-based theory. With an increase in product scope, an internal market can be built so that firms may successfully deal with the challenges posed by environments (Wan & Hoskisson, 2003). Furthermore, a significant increase in business segments diversification is an effective and suitable corporate strategy for dealing with market imperfections in institutionally weak environments (Nachum, 2004). These arguments may be fit for the Chinese context. Economic benefits can be obtained from the creation of internal markets by increasing the business scope of firms (Lee et al., 2008; Wan & Hoskission, 2003). Firms can also acquire financial advantages by using internal markets for capital allocation and other resources (Berger & Ofek, 1995; Palich et al., 2000). Furthermore, the resource-based theory provides an internal perspective that emphasizes the intention of firms to maximize the utilization of their common resources and capabilities by diversifying into related businesses (Wan et al., 2010). For example, China's tourism attraction management firms can leverage their continual cash flows generated from natural reserves and scenic spots to expand their businesses into merchandise, accommodation, and transportation. The key revenue source of Emei Mountain attraction management firm was from the entry ticketing fee of its scenic spots, occupying 43% of total revenue in 2015. The fast growth rates in generating revenue for this firm can be seen from its hotel and cable car business segments, 16 % and 7%, accounting for 45% of total revenue together (Emei Mountian, 2018).

The higher transaction costs may be generated for firms under an institutionally weaker environment than those under an institutionally stronger environment due to the market imperfections in terms of labor, external capital, and product markets (Wan & Hoskisson, 2003). From the perspective of transaction cost theory, the costs of business segments diversification tend

to outweigh the benefits once the scope of product and operations increases (Markides, 1995; Williamson, 1981). In Chinese tourism firms, an increase in transaction cost occurs when a product or service is transferred from one stage to another. For example, this situation commonly occurs in Chinese tourism firms that provide travel, accommodation, and transportation services together. A tour package can be fully arranged internally by a firm's subsidiary business divisions that operate travel, accommodation, and transportation services. However, additional costs may be incurred when several external parties offer cheaper accommodation and transportation services at the same standard (e.g., cheaper air tickets and the same level of standard of hotels offered by external firms) than internal arrangements. The tariffs on air tickets and hotels vary significantly based on different suppliers, which is a natural feature of the tourism industry in China. An inverted U-shape relationship between business segments diversification and firm performance was identified in the current study, which is in line with the results of Shen et al. (2011). China is still at the stage of transition. Available resources from the external environment are limited in the transition economy. When a firm increases its business segments diversification at a high level, the possible failure of gaining resources for business segments diversification exists. Delios et al. (2008) emphasized that resource scarcity is the key constraint in implementing business segments diversification successfully; thus, competition for resources leads to high additional costs of control and coordination among different products.

A positive moderating effect of geographic diversification was identified in this study by comparing the results of two subgroups: a group of firms with geographic diversification and another group without geographic diversification. The positive effect of business segments diversification on firm performance was supported in the group of firms with geographic diversification and was not supported in the group of firms without geographic diversification.

These results are consistent with many prior studies (e.g., Barney, 1991; Buckley & Strange, 2011; Kang & Lee, 2014) indicating that the benefits of geographic diversification may originate from market power, economies of scales, learning effects, and risk reduction that firms have gained across different geographic locations.

From the perspective of market power, when Chinese tourism firms operate their businesses in different geographic markets, they gain conglomerate power and establish a dominant position to mitigate competition and increase their bargaining power in diverse geographic markets (Montgomery, 1994). The diverse needs of customers can be satisfied by an increase in product diversity. Particularly, the Chinese tourism industry is characterized by a relatively high degree of business segments diversification to satisfy different market segments (Gu et al., 2012). Chinese hotel firms offer not only traditional accommodation services but also food and beverage services, meeting and event planning services, and retail businesses. Chinese tourism attraction firms provide a wider range of services or products than hotel firms, such as selling of scenic tickets, transportation and accommodation services, and entertainment activities within attractions. In addition, Chinese travel agencies provide many different travel products with different packages targeting distinct market segments. The combination of geographic and business segments diversification spreads the effect of the market power on firms. Various services and products can be obtained by different customers across different geographic markets.

Applications of Optimal Diversification

This study has identified the range of degree of diversification for optimizing both accounting-based performance measure (ROA) and market-based performance measure (Tobin's Q), from 1.24 to 1.54. Table 8 presents an example of how the entropy diversification index is calculated with specific percentages of a firm's sales in different business segments.

[Please insert Table 8 here]

For instance, Table 5.1 assumes a firm with five business segments from two 4-digit industries. The distributions of the firm's core business and its related and non-core businesses are demonstrated. While the sales percentage of the core business reaches about 60% of the total sales and the entropy index is calculated as 1.23, the firm's ROA is very close to 1.24 and nearly optimal. While the sales percentage of the core business decreases to 30% and the entropy index is calculated as 1.56, the firm's Tobin's Q is very close to 1.54 and nearly optimal. In short, the more diverse business segment firms operate, the more they can boost their Tobin's Q, and the less diverse business segments, which comprise up to 60% of the total revenue, can optimize the firm's ROA. Furthermore, Chinese publicly-traded tourism firms can also learn that they may need to invest in or diversify other businesses to further maximize ROA and Tobin's Q, if their core businesses occupy over 60% of the total sales revenue. At the same time, the core businesses being less than 30 % of the total sales revenue may be considered as a case of over-investing and excessive diversification.

6. Conclusion

This study empirically validated the positive effect of business segments diversification on firm performance in Chinese tourism firms. This study is among the first to identify the nonlinear (inverted U-shape) relationship between business segments diversification on firm performance in the context of Chinese tourism firms. Several Chinese scholars also identified a negative effect of business segments diversification on firm performance (e.g., Chen, 2013). Therefore, the nonlinear relationship found between these two constructs is meaningful because the optimal point of business segments diversification was captured in the study under the Chinese tourism context.

Second, this study contributes to the literature on diversification in a tourism context. Although many studies have investigated geographic and business segments diversification in industrial multinational enterprises (e.g., Mrork & Yeung, 2003; Tallman & Li, 1996), empirical studies in the tourism industry are limited. Moreover, given that the moderating effect of geographic diversification on the relationship between business segments diversification and firm performance in the context of tourism has been rarely explored, this study enriches the existing literature on by shedding light on geographic diversification as a moderating factor. This study also focused on geographic diversification domestically, that is, crossing different provinces within China. This study differs from other studies that focused on geographic diversification across country borders, which is known as international diversification or geographic diversification of multinational enterprises. Without the intervention of different institutional factors of geographic diversification crossing country borders, the effect of domestic geographic diversification is also meaningful because the Chinese economy is large and known as the world's second-largest economy. This study fills the gap in the literature on geographic diversification in China.

Thirdly, this study helps hotel owners and management teams of Chinese tourism firms achieve an improved understanding of the effect of business segments diversification on firm performance in general. Business segments diversification benefits firms with regard to financial performance. Increasing product diversity is still a good strategy for pursuing additional business growth. However, the finding of the significant inverted U-shape relationship between business segments diversification and Tobin's Q suggested that the costs of business segments diversification may outweigh the benefits with regard to firm value when the degree of business segments diversification is beyond the optimal level. Management needs to monitor the degree of business segments diversification.

This study is not free of limitations. Generalizability is one of the limitations because the sample only contained publicly traded tourism firms in Chinese stock exchanges; thus, unlisted firms are not represented. Future research is advised to examine the topic in private firms wherein the agency problem may be less influential, and the internal transaction cost may be less obvious, which may lead to different results. Furthermore, the study was only based on Chinese tourism firms; therefore, the findings may not contribute to research on firms in other countries. In this regard, future research can investigate the moderating effects of the factors on the relationship between business segments diversification and firm performance in other countries or regions.

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