Journal of Destination Marketing & Management 22 (2021) 100655

Contents lists available at ScienceDirect

Journal of Destination Marketing & Management

journal homepage: www.elsevier.com/locate/jdmm

Crowding-out or crowding-in: The impact of Chinese tourists on selected tourist segments in Vietnam destinations

Linh H. Le *, Jorge Ridderstaat

Rosen College of Hospitality Management, University of Central Florida, USA

ARTICLE INFO

Keywords:
Crowding impact
Crowding-out effect
Crowding-in effect
Tourist demand
China
Vietnam
Southeast Asia
Limited information maximum likelihood

ABSTRACT

This study estimates the short and long-term impacts of Chinese tourists on Vietnam's five leading inbound tourist markets. While most prior studies perceive crowding as an undesirable phenomenon relating to visitors' dissatisfaction and lower perceived destination attraction, this study extends the understanding of crowding's impacts on tourism by identifying crowding-out and crowding-in effects among tourist segments. The study contributes to the existing literature by considering crowding's impacts on different cultures in Vietnam's context, representing a fast-growing tourist destination that only earned a reputation in recent years and is different from ones previously considered. The methodology includes unit root, cointegration, causality testing, and application of the Limited Information Maximum Likelihood regression method. The findings indicate that Chinese tourist demand has primarily positive impacts on the other researched tourist markets. The findings provide practical implications for policymakers to strengthen inbound markets and enhance sustainability-oriented tourism development in the long run.

1. Introduction

Crowding is an enduring issue attracting the attention of tourism and recreation scholars because of growing social demands for outdoor activities and limiting spaces' uses due to environmental impacts (Arnberger & Mann, 2008; Dogru-Dastan, 2020). Crowding in prior literature refers to either density measured by the number of people per unit of physical space or individual assessment of crowding related to social carrying capacity (Dean, Pugh, & Gunderson, 1978). This complex phenomenon has been extensively discussed in tourism as an aspect of sustainability since it not only relates to ecological problems (Wang, Huang, Gong, & Cao, 2020) but also affects visitor satisfaction and experience quality (Dogru-Dastan, 2020), and results in tourists' behavioral changes (Gonzalez, Coromina, & Galí, 2018). One of the tourism industry's significant constraints is the limited quantity of tourism products available to travelers' enjoyment (Goeldner & Ritchie, 2007). Therefore, the excessive presence at heritage attractions that are fragile sites may damage the conservation (Petr, 2009). In addition, the surpass of demand over destination capacity may lead to the competition in consuming limited tourism products among customers gathering at a destination, leaving adverse consequences on tourism and local communities (Andereck & Nyaupane, 2011; Jin & Pearce, 2011), visitors' dissatisfaction, and lower perceived destination attraction (Brown, Kappes, & Marks, 2013; Yin, Cheng, Bi, & Ni, 2020). As a reset button for the world, the Covid-19 pandemic is perceived as a great opportunity to prepare long-term plans addressing over-tourism before the normalcy of tourism resumes (Koh, 2020). Therefore, research on crowding's impacts on tourism at the moment is significant to build a long-term crowd-controlling plan.

Referring to a phenomenon in which an agent was limited or eliminated by another, the crowding-out effect is a prevalent topic in the literature of crowding's impacts. Extant literature has examined the crowding-out effect caused by the tourism industry on other sectors (Dwyer, Forsyth, Madden, & Spurr, 2000; Wang, Wan, & Dong, 2014), by new tourism products on existing ones (Bresson & Logossah, 2011; Song, Dwyer, Li, & Cao, 2012), and by tourists on residents (Andereck & Nyaupane, 2011; Ferreira, Ramos, & Lahr, 2019; Fourie & Santana-Gallego, 2011). However, the question of whether tourists crowd out other tourists has not been sufficiently addressed (Schuckert & Wu, 2021). While some prior studies indicated the existence of crowding-out effect among several tourist segments (Chou, Hsieh, & Tseng, 2014; Su, Lin, & Liu, 2012; Yang & Lo, 2018), others found no crowding-out effect on either Chinese or non-Chinese tourist arrivals to Taiwan (Lin & Lee, 2020). Although crowding is mostly perceived as a

* Corresponding author.
E-mail addresses: linhle@knights.ucf.edu (L.H. Le), Jorge.Ridderstaat@ucf.edu (J. Ridderstaat).

https://doi.org/10.1016/j.jdmm.2021.100655
Received 2 October 2020; Received in revised form 8 July 2021; Accepted 11 August 2021
Available online 16 August 2021

driver of travelers' negative reactions (Kim & Park, 2008; Jacobsen, 2000; Yeh, Wai Aliana, & Zhang, 2012), it was found to promote event excitement and atmosphere in a certain context such as festivals and events (Mowen, Vogelsong, & Graefe, 2003). Supporting Neuts, Nijkamp, and Van Leeuwen (2012), who argue that tourists' perception of density is not necessarily negative in every setting, Petr (2009) considers crowding an indicator of a tourist's popularity and reputation, which may crowd in tourists to the destination. Therefore, generalization across contexts is needed to provide insights into the crowding-out and crowding-in effects among tourists.

Empirical findings investigated different levels of Chinese tourist's crowding-out effect on tourists from several markets (e.g. Singapore, South Korea, the United States) while identifying insignificant impacts on those from other countries (e.g. Australia and the United Kingdom) (Chou et al., 2014). In addition, there has not been a consensus in explaining the role of cultural differences in the perception of crowding. While several studies confirm that Western people have a higher level of tolerance for crowding than Eastern ones (e.g. Jin, Hu, & Kavan, 2016; Jin & Pearce, 2011), other studies argue that the formers are more sensitive to crowds than the latter (Neuts & Nijkamp, 2012). The literature's inconsistency suggests a necessity for further investigation on the impacts of crowding across Eastern versus Western countries.

Drawing from critical gaps in the literature on crowding's impacts, this study addresses the inquiry of whether crowding-out or crowding-in effects exist among tourist markets. Ranking third among the ten fastest-growing travel destinations in 2017 (UNWTO, 2018), Vietnam has only earned its reputation in recent years and experienced the soaring flux of international tourists in a short time, which is different from long-standing-famous destinations considered previously. Extending to this Southeast Asian country will contribute to prior understandings of crowding's impacts on tourism. More specifically, to assess the significant impacts, the study examines the effects of tourists from China, the dominant market of Vietnam tourism, on tourists from the other five leading segments traveling to this destination. While crowding's impact among tourists cannot be observed immediately due to a lag time for tourists from a segment to change their behavior under the effect of tourists from other segments, the vast majority of literature on crowding was cross-sectional (Dogru-Dastan, 2020). The study bridges the research gap by using Limited Information Maximum Likelihood (LIML) estimation on time-series data between September 2008 and January 2020 to determine both long- and short-term effects of a dominant tourist segment on others. The impact of the COVID-19 pandemic has not been considered in this study because the event is still ongoing, and Vietnam has been closing its border against international tourists, while the study aims to estimate crowding's impacts when the tourism returns to normalcy. The study also provides empirical evidence to explain different crowding's impacts across various cultures. Finally, by using Vietnam as the study context, the findings of the existence of crowding-out or crowding-in effects provide robust evidence helping Vietnam policymakers in defining short- and long-run strategies to manage tourist flow effectively and avoid either overcrowd or disorders in inbound tourist demand.

The next section briefly reviews the literature on crowding's effect in tourism, case studies, and hypotheses development. Section three describes data and employed methodology, followed by discussing the research findings in section four. The final section presents the implications and limitations of the study and provides suggestions for future research.

2. Impacts of crowding in tourism

Crowding is a complex phenomenon that is determined by the number of people encountered and depends on various factors like the perceiver's personal characteristics, preferences, motivations, and norms (Moyle & Croy, 2007). In the literature on crowding's impacts, crowding was mostly perceived as a psychological experience elicited by stress due to perceived density (Stokols, 1972). Prior studies in the tourism field refer to crowding as individuals' negative evaluation of density levels at a certain physical area considering their acceptable boundary (Shelby & Heberlein, 1984). Several social-psychological theories explained the outcomes of this psychological construct.

The theory of stimulus overload posits that individuals perceive crowded when they feel overwhelmed by other visitors' presence (Schmidt & Keating, 1979). The feeling of crowdedness, thus, was found to reduce tourists' comfort levels (Zehrer & Raich, 2016) and positively associated with negative emotions such as unhappiness, stress, disturbance levels, and concerns of safety (Bajada & Titheridge, 2017; Hwang, Yoon, & Bendle, 2012; Klanjšček, Geček, Marn, Legović & Klanjšč, 2018; Mattila & Hanks, 2012). Existing literature also shows that perceived crowding anticipates visitors' avoidance behaviors, including leaving a destination, switching to another area, shifting to another location in the area, visiting in off-season or weekdays to avoid crowds (Arnberger & Haider, 2007; Fleishman, Feitelson, & Salomon, 2007; Kirchgessner & Sewall, 2015; Manning & Valliere, 2001). The latter can be explained by the psychological reactance theory, suggesting that people likely engage with resistance intention when restricted by choice (Brehm & Brehm, 1981). According to this psychological reactance theory, Hui and Bateson (1990) propose that a density level of people at a destination limiting or eliminating visitors' desired activities is considered overabundant. The latter implies that perceived overcrowding may lead to negative tourists' post-experience behavior. Previous studies reveal that crowding adversely affects visitors' intention to revisit and recommend the destination to others (Arnberger & Brandenburg, 2007; Li, 2018). Hence, the crowding phenomenon is predicted to influence current tourists and future visitors to a destination.

The notion of the "crowding-out effect" has been extensively discussed in various study areas, including public spending (Sloboda & Yao, 2008), monetary policy (Rode, Gómez-Baggethun, & Krause, 2015), investment (Afonso & St. Auby, 2009), and pro-social behavior (Vilnai-Yavetz & Levina, 2018). Rooting from the economics field, the crowding-out effect refers to the negative relationship between government expenditure and private investment (Abrams & Schitz, 1978). The other view later found evidence to prove that government expenditure on infrastructure can stimulate private investment in developing countries (Ahmed & Miller, 2000), thus, suggesting the existence of crowding-out and crowding-in effects simultaneously. In the tourism literature, crowding has been predominantly associated with undesirable effects, i.e., crowding-out outcomes. While crowding-in effects have been remained unexplored by the prior studies, Schuckert and Wu (2021) identify four tourism research streams previously conducted on the crowding-out effect which are negative influences of (1) tourism industry on other sectors (Dwyer et al., 2000; Wang et al., 2014), (2) new products on existing ones (Bresson & Logossah, 2011; Song et al., 2012), (3) tourists on residents (Andereck & Nyaupane, 2011; Ferreira et al., 2019; Fourie & Santana-Gallego, 2011; Yang & Lo, 2018), and (4) tourists on other tourists (Chou et al., 2014; Su et al., 2012). This study looks at the last stream, i.e. the effect of one tourist market on others.

Several extant studies investigated that one tourist segment can negatively affect tourists from other segments. As a result of Taiwan's opening policy to Chinese visitors, the high number of tourists from mainland China caused a considerable drop in the number of tourists from Japan and the United States (Su et al., 2012), South Korea, Singapore, and the United States (Chou et al., 2014). This crowding-out effect is explained by the competition among customer segments consuming the similar products concurrently (Chou et al., 2014). Since Taiwan is a small island with limited tourism resources, the overdemand from the China segment exceeded its supplying capacity, leading to deficient tourism products and overcrowded destinations (Su et al., 2012). Taiwan's travelers from other countries would face limited choices of tourism services (i.e., hotel rooms, restaurant tables, spaces at attractions, etc.) caused by the high occupancy of Chinese tourists. Consequently, they avoided the crowd by switching to other

destinations, resulting in a drastic decline of these tourist segments and a disorder in Taiwan's inbound tourist market. Nonetheless, no crowding-out effect of Chinese tourists was revealed on tourists from Hong Kong (Su et al., 2012), Australia, and the United Kingdom (Chou et al., 2014). On the other hand, Lin and Lee (2020) found no significant negative impact of China's flux on all inbound tourists to Taiwan. In summary, prior literature has provided evidence to validate either the existence or non-existence of the crowding-out effect across tourist segments. This inconsistency in previous empirical findings infers a necessity of studying crowding's impact at other destinations than Taiwan.

While the overcrowding of a tourist segment may predict some other tourist segments' avoidance behavior, Neuts et al. (2012) argue that tourists' assessment of visitor density is not necessarily negative in every setting and may depend on personal preference. The extant research indicates that tourists either dislike, or accept, or even appreciate other tourists and locals (Dowling, 2006; Jurado, Damian, & Fernández--Morales, 2013; Marušić, Horak, & Tomljenović, 2008). The perception of crowding also varies among different cultures. While several studies confirm that Western people have a higher level of tolerance for crowding than Eastern ones (Jin et al., 2016; Jin & Pearce, 2011), others argue that the former is more sensitive to crowds than the latter (Neuts & Nijkamp, 2012). In some contexts, and for certain travelers, high social density may be favored since it allows an environment stimulating social interaction (Jacobsen, 2002). Similarly, in different settings such as festivals and events, crowding can promote visitors' excitement and atmosphere (Mowen et al., 2003) and encourage positive emotions like happiness, energy, and relaxation (Kim, Lee, & Sirgv, 2016). As being perceived as an indicator of a tourist destination's popularity and reputation (Petr, 2009), crowding may promote the increasing flux of tourists to destinations, predicting the presence of crowding-in effect among tourist segments. Therefore, the generalization across different contexts is needed to understand the crowding's impact on various tourist segments.

3. Case of study

Vietnam was selected for this study for several reasons. First, ranking third among the ten fastest-growing travel destinations globally in 2017 (UNWTO, 2018), Vietnam is one of Southeast Asia's most popular tourist destinations with several prestigious titles like World Heritage destination or Best Golf destination. However, currently struggling with issues regarding environmental pollution, unoriginal tourism products, and temporary services (Tseng et al., 2018), Vietnam does not have adequate tourism resources and experience to keep up with the surging number of tourists in a short time, predicting a high competition in consuming tourism products among tourists being at the destination concurrently. The latter enabled Vietnam to be a representative destination for studying the crowding's effect. Second, most tourists to Vietnam primarily come from China, covering 4.9 billion trips and 32 % of Vietnam's total arrivals (VNAT, 2019). Every change in this dominant segment is expected to leave huge impacts on other segments, thus being appropriate for crowding research. Third, Vietnam attracts visitors from diverse source markets with 83 % of total international travelers from ten leading markets (VNAT, 2019), providing a chance to study crowding's effects across various tourist segments. Finally, unlike Taiwan or Hongkong, famous international tourism destinations and already used as illustrative cases for tourist crowding phenomenon (Chou et al., 2014; Schuckert & Wu, 2021; Su et al., 2012), Vietnam tourism has only earned its reputation in recent years. Selecting Vietnam as a case to study allows examining the crowding's effect in a different context from ones that have been considered in existing research.

Occupying the largest share in Vietnam, the Chinese tourist market easily affected Vietnam's inbound tourism. For example, the decline of foreign tourists to Vietnam in the first quarter of 2015 was explained by the decrease in Chinese tourists to Vietnam due to the dispute between these two countries over the Vietnam East Sea (Truong & Le, 2017). The dominant role of this tourist segment has been increasingly strengthened because of Vietnam's attempts in destination promotion towards the segment. More Chinese visitors are attracted by Vietnamese diversity in natural attractions and colorful cultures and encouraged to visit Vietnam with the easy entry procedure allowed by policies of Approved Destination Status countries. As China and Vietnam share a long cross-border, which provides easy access between two countries, Chinese visitors can effortlessly travel to Vietnam by land through Ha Long bay, a very famous sightseeing attraction of Vietnam (Truong & King, 2009). With the diversity, easy accessibility, proximity, and affordability aligning with Chinese tourists' preferences, Vietnam is expected to be one of their favorite destinations in upcoming years continuously. The latter anticipates the enduring impact of the Chinese tourist segment on Vietnam's inbound tourism in the long term.

The current situation of the Vietnam tourism industry may predict the negative impact of an excessive number of Chinese tourists on tourists from other countries to Vietnam. Despite the rapid tourism growth, Vietnam is facing difficulties in encouraging return visitors due to pollution, limited quantity and quality of tourism products, poor customer service (Truong & Le, 2017), and still inexperienced in handling these significant challenges (Tseng et al., 2018). These unsolved problems can be aggravated because Vietnam does not have adequate resources to obtain international tourist retention while attempting to meet the China segment's overdemand. According to the psychological reactance theory, individuals likely develop resistance behaviors to cope with the limited choice situation (Brehm & Brehm, 1981). Their desired actions would be restricted or eliminated by a high-density level of visitors who concurrently consume tourism products with them (Hui & Bateson, 1990). In other words, the presence of overcrowding of Chinese tourists may increase the competition in consuming limited tourism products at Vietnam destinations, crowding out tourists from other segments. For instance, there was a decrease in several tourist segments including the United States, the United Kingdom, France, and Canada in 2019, following a steep rise in the number of Chinese arrivals to Nha Trang city, Vietnam (by 60 % of the total) (Khanh Hoa Department of Tourism, 2019). Besides, the figures from the UNWTO report in 2018 show that within the Southeast Asia region, Vietnam's international tourism receipt is around four billion U. S. Dollars less than Indonesia's earnings from inbound tourism, despite their similar total number of international tourist arrivals (approximately 30,000 trips). This fact implies that while having the fastest growth by earning massive numbers of international arrivals from the Chinese tourist segment, Vietnam's tourism is still losing the share of high-spending markets, which usually have larger contributions to the total revenue than to the total arrivals. Given the theoretical background and practical observation above, it is suggested that there may be a crowding-out effect that tourists from China pose on tourists from other segments to Vietnam in both the short-term and long-term. To obtain a clear observation, the study examines the impact of Vietnam's largest tourist segment, China, on the other five leading markets regarding the number of international arrivals to Vietnam in 2019 (South Korea, Japan, Taiwan, the United States, and Malaysia). The Russian market is excluded due to the lack of data in the period from 2008 to 2020. The hypotheses are proposed as following:

Hypothesis 1: The number of Chinese visitors negatively influences the tourist arrivals from (a) South Korea, (b) Japan, (c) Taiwan, (d) the United States, and (e) Malaysia to Vietnam in the short term.

Hypothesis 2: The number of Chinese visitors negatively influences the tourist arrivals (a) South Korea, (b) Japan, (c) Taiwan, (d) the United States, and (e) Malaysia to Vietnam in the long term.

Fig. 1 provides a schematic overview of the study. The striped arrows indicate the negative impact of Chinese tourist demand on the selected markets, both in the long- and short-term, as indicated by the proposed hypotheses.

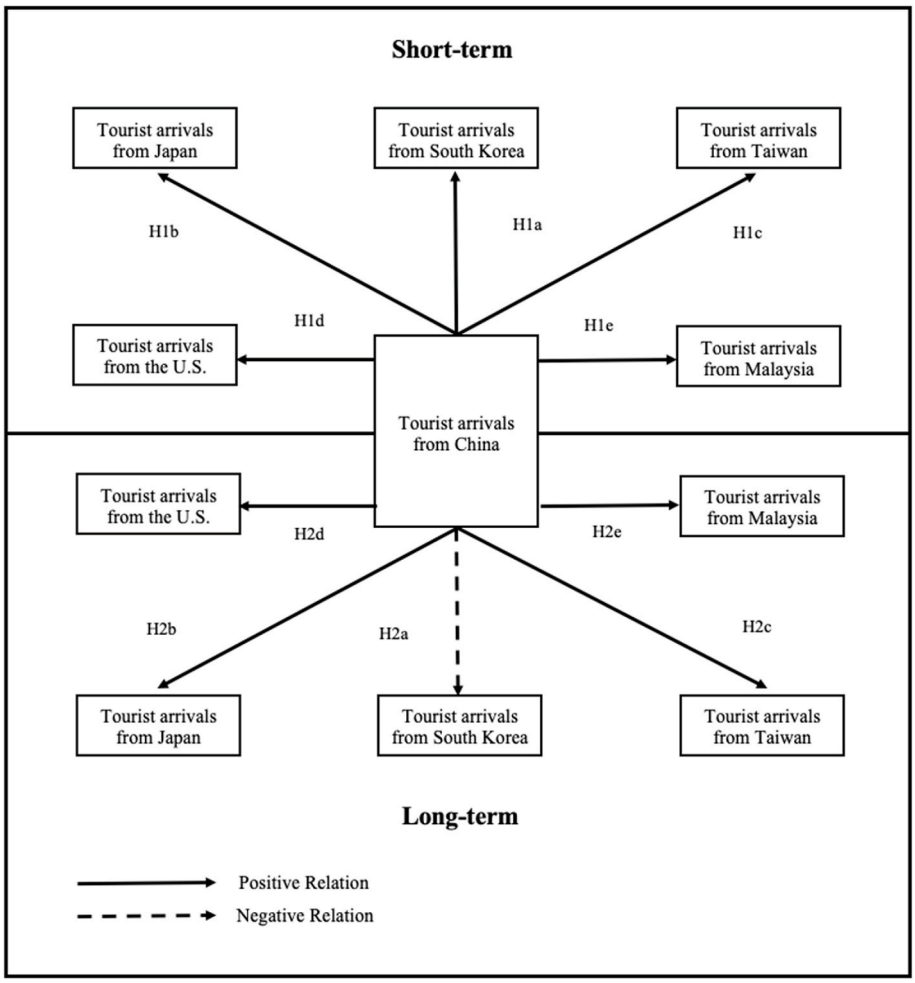

Fig. 1. Schematic overview of the research (tourist arrivals to Vietnam).

4. Methodology

4.1. Data collection

To investigate the crowding impacts among tourist segments, this study examines the short- and long-term relationship between tourists from the dominant market, China, and those from the other five leading segments to the Vietnam destination. The study used monthly time-series data of tourist arrivals, in line with Song, Witt, & Li (2009), and considered international tourist arrivals from six selected countries to Vietnam, from September 2008 to January 2020. The data source is the Vietnam National Administration of Tourism. The collected data were first transformed into logarithm form to narrow down the volatility and to limit potential heteroskedasticity in the data (Wooldridge, 2013).

The transformed data were subsequently deseasonalized using the Unobserved-Components Model and used the seasonally-adjusted data with the Christiano-Fitzgerald filter (Christiano & Fitzgerald, 2003) to retrieve the trend and cyclical components of the tourism demand. Table 1 presents an overview of the descriptive characteristics of the decomposed elements.

The decomposed data were then standardized to ensure comparable data. Figs. 2 and 3 illustrate the movement of trend and cyclical components of the variable of tourism demand from China with those of the remaining countries. The trend data represent the long-term

Table 1
Variables description.

Variable	Description	Mean	Median	Maximum	Minimum
LCHI_TCF	Trend component of tourist demand from China to Vietnam	11.99163	11.97128	13.33651	10.70617
LCHI_C2CF	Cyclical component of tourist demand from China to Vietnam	−0.0094623	0.0132123	0.2815877	−0.3023662
LKOR_TCF	Trend component of tourist demand from South Korea to Vietnam	11.39436	11.12344	12.80431	10.19611
LKOR_C2CF	Cyclical component of tourist demand from South Korea to Vietnam	−0.0046867	−0.0047694	0 .1646886	−0.2289696
LTWN_TCF	Trend component of tourist demand from Taiwan to Vietnam	10.52792	10.43917	11.26745	10.02363
LTWN_C2CF	Cyclical component of tourist demand from Taiwan to Vietnam	−0.0006405	0.0003784	0.1182886	−0.1464761
LJPN_TCF	Trend component of tourist demand from Japan to Vietnam	10.85005	10.8655	11.29537	10.22374
LJPN_C2CF	Cyclical component of tourist demand from Japan to Vietnam	−0.0097829	0.0026091	0.0937445	−0.2700108
LUSA_TCF	Trend component of tourist demand from the U.S. to Vietnam	10.62714	10.55855	11.07619	10.23359
LUSA_C2CF	Cyclical component of tourist demand from the U.S. to Vietnam	−0.0015305	0.0018946	0.0567926	−0.0675527
LMAL_TCF	Trend component of tourist demand from Malaysia to Vietnam	10.21209	10.22787	10.79689	9.594548
LMAL_C2CF	Cyclical component of tourist demand from Malaysia to Vietnam	−0.0048336	0.0227837	0.1251991	−0.196254

Note: All variables have been transformed into logarithm.

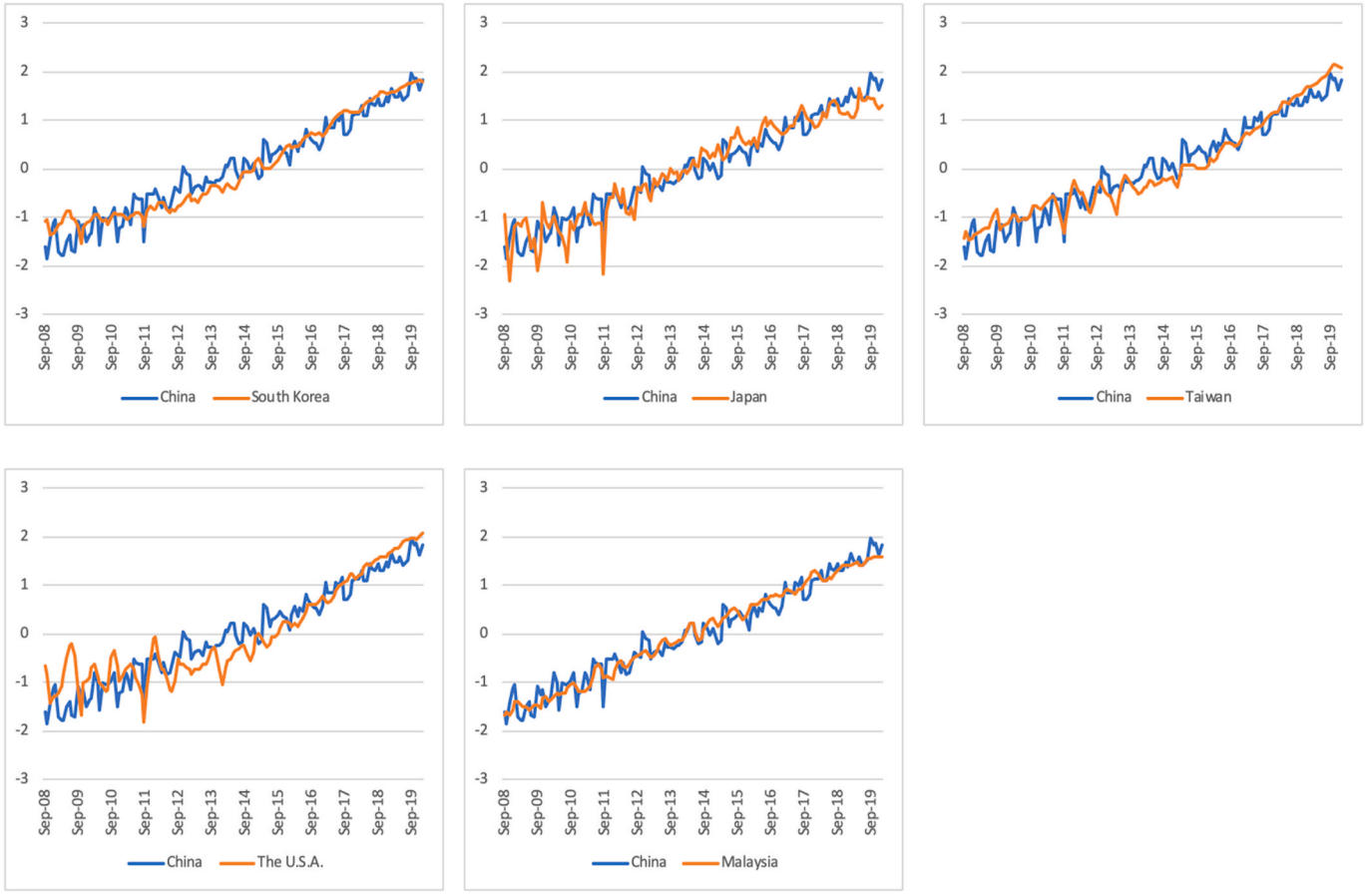

Fig. 2. Trend component of tourist arrivals to Vietnam from selected countries.

perspective, while the cyclical data represent the short-term deviations around the trend. Although there is some co-movement level in the trend charts, a deeper view still reveals discrepancies between the long-term developments between the Chinese and the other selected markets (Fig. 2). The discrepancies become particularly visible when considering the short-term cyclical developments between the Chinese and the selected markets (Fig. 3). The visual inspection gives a first impression of the data, but a deeper analysis provides further details.

4.2. Methodological procedures

The methodology consists of several steps. First, both trend and cycle data were tested for stationarity by employing the Augmented Dickey-Fuller test (ADF), the Phillips-Perron test (P.P.), and the Modified Dickey-Fuller test (DF-GLS) (Dickey & Fuller, 1979; Elliott, Rothenberg, & Stock, 1996; Phillips & Perron, 1988). The analysis for data stationarity is required to avoid spurious regression results.

Second, the independent and dependent variables are tested for cointegrating relationships to evaluate their long-term connection using the cointegration method proposed by Engle and Granger (1987). The cointegration tests are performed for both trend and cyclical components to determine whether tourists from China and other segments diverge from each other in the long run (Granger, 1986). Subsequently, the study analyzed the causal relationship between Chinese tourist demand and other tourist markets' demand. For this purpose, the researchers employed the Granger causality Wald test for both trend and cyclical components of the data.

Finally, the study applied the Limited Information Maximum Likelihood estimator (LIML) to estimate the elasticity of the long-term and short-term effects of tourists from China segments on those from the selected five segments to Vietnam. The instrumental approach with the LIML has been employed to rectify endogeneity and suggested small-sample-size studies (Hayashi, 2000; Poi, 2006; Stock, Wright, & Yogo, 2002). The instruments which are used to replace the independent variable in the analysis should meet two requirements: (1) significantly correlating with the endogenous variable and (2) insignificantly correlating with the error term (Gujarati, 2014).

5. Results and discussion

5.1. Unit root test result

The results of unit root tests for both trend and cycle variables are presented in Table 2. The test findings indicate that most of the variables are stationary at the level and first difference form except for the trend components of South Korea, Japan, and the United States. The latter suggests that the first difference form is required in regression analyses where Korean, Japanese, and American tourist demand trend components are involved. Moreover, the level form is sufficient when conducting regression with the remaining variables. In all other cases, the data suggest stationarity at both the level and first difference forms, which allows the study to use level-based data when considering the regression analyses using these variables.

5.2. Cointegration results

In Table 3, the results of cointegration tests indicate that, generally, there were no long-run relationships between the Chinese segments and remaining segments, both in the long- and short-term. The only exception was the long-term relationship between tourists from China and Malaysia, showing that both markets share a common trend. There was no evidence of common trends and cycles between Chinese tourist

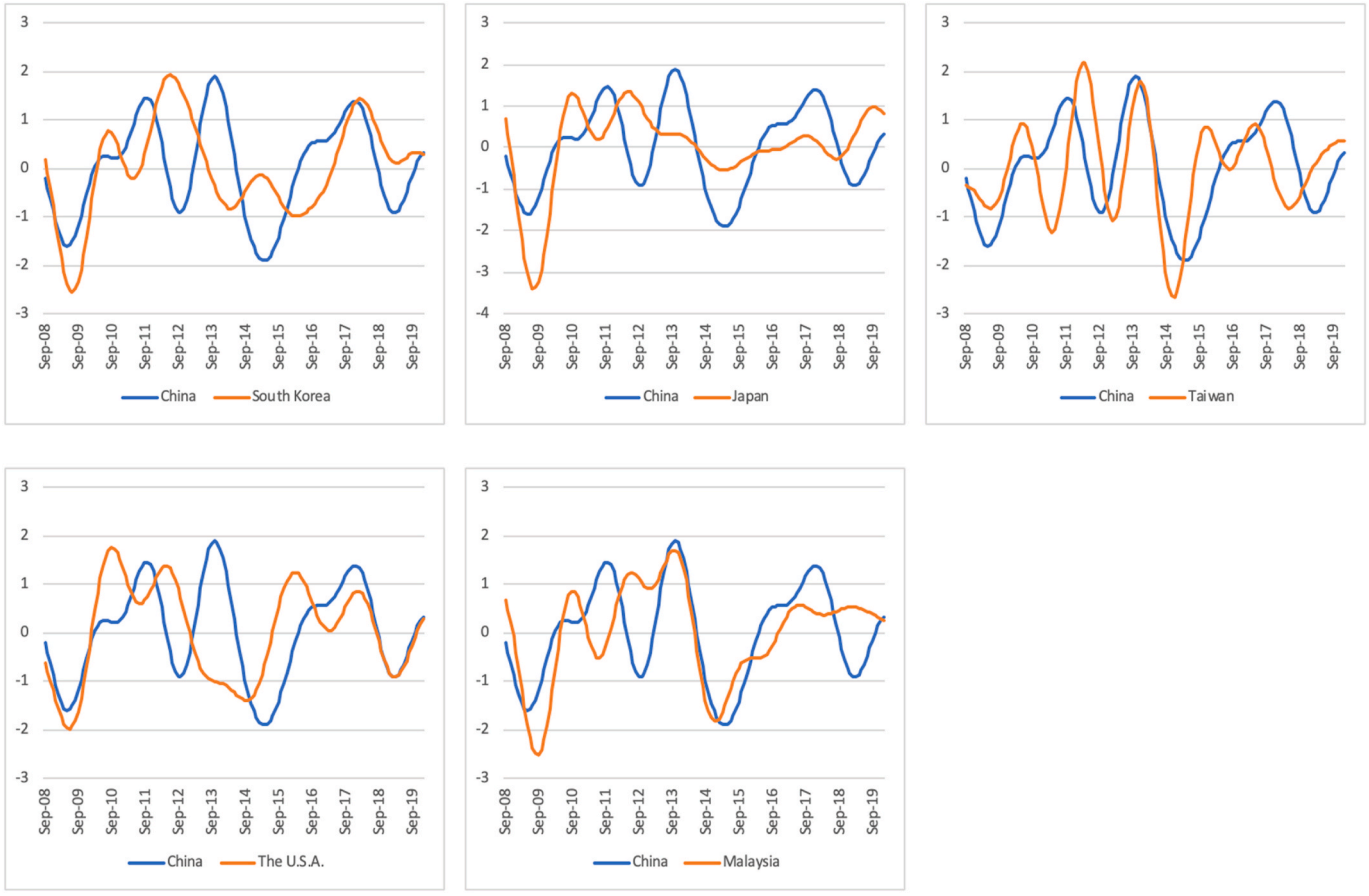

Fig. 3. Cyclical component of tourist arrivals to Vietnam from selected countries.

Table 2
Unit root test results.

Variable	Model Type		ADF	PP	DF-GLS	Integration
Trend components						
LCHI_TCF	Basic	Level (lag = 4)	0.241	−1.170	2.508**	I(0) or I(1)
	Basic	First difference (lag = 3)	−9.850***	−15.001***	−3.014***	
LKOR_TCF	Basic	Level (lag = 0)	0.446	0.435	1.963	I(1)
	Basic	First difference (lag = 0)	−10.378***	−10.327***	−9.806***	
LJPN_TCF	Basic	Level (lag = 12)	−0.619	−0.891	1.533	I(1)
	Basic	First difference (lag = 12)	−2.699**	−19.315***	−1.787*	
LMAL_TCF	Basic	Level (lag = 2)	−0.726	−0.678	2.205**	I(0) or I(1)
	Basic	First difference (lag = 1)	−9.104***	−7.494***	−9.065***	
LUSA_TCF	Basic	Level (lag = 2)	−0.663	−0.331	1.355	I(1)
	Basic	First difference (lag = 1)	−9.662***	−8.582***	−6.531***	
LTWN_TCF	Basic	Level (lag = 2)	−0.033	−0.107	4.297***	I(0) or I(1)
	Basic	First difference (lag = 1)	−9.211***	−9.161***	−7.704***	
Cyclical components						
LCHI_C2CF	Basic	Level (lag = 3)	−12.925***	−2.614**	−11.682***	I(0) or I(1)
	Basic	First difference (lag = 3)	−15.881***	−3.194**	−5.019***	
LKOR_C2CF	Basic	Level (lag = 3)	−10.547***	−2.350**	−10.924***	I(0) or I(1)
	Basic	First difference (lag = 3)	−11.184***	−3.215**	−3.064**	
LJPN_C2CF	Basic	Level (lag = 3)	−14.873***	−2.615***	−14.037***	I(0) or I(1)
	Basic	First difference (lag = 3)	−13.504***	−3.310***	−2.703***	
LMAL_C2CF	Basic	Level (lag = 3)	−13.353***	−2.539**	−11.226***	I(0) or I(1)
	Basic	First difference (lag = 3)	−14.328***	−3.217**	−4.858***	
LUSA_C2CF	Basic	Level (lag = 3)	−16.962***	−2.331**	−9.236***	I(0) or I(1)
	Basic	First difference (lag = 3)	−11.733***	−3.085**	−5.049***	
LTWN_C2CF	Basic	Level (lag = 3)	−12.557***	−3.299**	−9.723***	I(0) or I(1)
	Basic	First difference (lag = 3)	−15.488***	−3.611***	−14.548***	

***1 %, **5 %, *10 % significant levels.

Table 3
Cointegration results.

Trend variable structure in the regression equation	*t*-value	Cyclical variable structure in the regression equation	*t*-value
LCHI_TCF (independent), LKOR_TCF (dependent)	−2.946	LCHI_C2CF (independent), LKOR_ C2CF (dependent)	−0.804
LCHI_TCF (independent), LJPN_TCF (dependent)	−0.689	LCHI_ C2CF (independent), LJPN_ C2CF (dependent)	−0.823
LCHI_TCF (independent), LMAL_TCF (dependent)	−8.337***	LCHI_ C2CF (independent), LMAL_ C2CF (dependent)	−0.472
LCHI_TCF (independent), LUSA_TCF (dependent)	−3.007	LCHI_ C2CF (independent), LUSA_ C2CF (dependent)	−0.943
LCHI_TCF (independent), LTWN_TCF (dependent)	−3.090	LCHI_ C2CF (independent), LTWN_ C2CF (dependent)	−3.027

Null hypothesis: Series are not cointegrated.
***1 %, **5 %, *10 % significant levels.

demand and demand from the remaining markets in all other instances.

5.3. Granger causality Wald test results

As shown in Table 4, the Granger causality Wald test results indicate a causal effect of Chinese tourists on tourists from the other selected markets in the long term. The causality is, however, weak of nature in the majority of cases. The only non-causal result was from the impact of the trend of Chinese tourist demand on that of tourist demand from Malaysia; when considering the causality of the cyclical variables, the results illustrate mostly strong causal relations running from Chinese tourist demand to that of the other selected markets (Table 5).

5.4. Limited Information Maximum Likelihood (LIML) results

Since the authors used standardized values in the analysis, models will not include intercepts. The coefficient results are presented in z-scores, calculated as the LIML regression coefficient divided by the regression coefficient's standard error. The interpretation should be as follows: a one standard deviation increase in the independent variable will lead to an x standard deviation change in the dependent variable. Kleibergen-Paap rk L.M.'s statistic values were statistically significant, rejecting the hypothesis of model under-identification and meaning that the equations were not under-identified. The Kleibergen-Paap rk Wald F statistics were larger than the critical Stock and Yogo (2005) critical values, indicating no weak instrumental variables in the models. The Hansen J statistics were statistically insignificant, inferring that all instruments were valid for the model and that the excluded instruments were correctly eliminated from the estimated models. The additional statistics confirm assumptions that the regression models were not under-identified; all instruments were valid for the model, and estimated coefficients in the model were exogenous.

Unlike the expectation, the F test and Z coefficient results in Table 6 show that all of the short-term effects of tourists from China on tourists from other segments, including South Korea, Japan, Taiwan, the United States, and Malaysia, were significantly positive, rejecting hypothesis 1a, 1b, 1c, 1d, and 1e. Inconsistent with the conclusion of Chou et al. (2014) and Su et al. (2012), these findings are remarkable as they show that the Chinese market is a catalyst rather than a hindrance to developing the selected markets. This difference might be attributed to the two following reasons related to the context of Vietnam. First, Vietnam's

Table 4
Granger causality Wald test result with Trend Components.

Hypothesis	Lags	*F*-statistic	Prob > F	Conclusion	Hypothesis	Lags	*F*-statistic	Prob > F	Conclusion
Ho: LCHI_TCF does not Granger cause LKOR_TCF	1	4.14541	0.0437	LCHI_TCF → LKOR_TCF	Ho: LCHI_TCF does not Granger cause LUSA_TCF	1	7.17911	0.0083	LCHI_TCF → LUSA_TCF
	2	5.30186	0.0061			2	7.33817	0.0010	
	3	3.41973	0.0194			3	3.54434	0.0165	
	4	2.64984	0.0364			4	3.35654	0.0120	
	5	1.94992	0.0910			5	4.26350	0.0013	
	6	1.72480	0.1211			6	4.01324	0.0011	
	7	1.50125	0.1737			7	3.60422	0.0015	
	8	1.92086	0.0636			8	3.06213	0.0037	
	9	1.97366	0.0491			9	2.50781	0.0120	
	10	1.82419	0.0649			10	3.20195	0.0012	
	11	1.45731	0.1593			11	3.42694	0.0004	
	12	1.34626	0.2050			12	3.20341	0.0007	
Ho: LCHI_TCF does not Granger cause LJPN_TCF	1	20.6001	0.0000	LCHI_TCF → LJPN_TCF	Ho: LCHI_TCF does not Granger cause LTWN_TCF	1	0.17395	0.6773	LCHI_TCF → LTWN_TCF
	2	9.86673	0.0001			2	3.39275	0.0366	
	3	4.11052	0.0080			3	2.36360	0.0743	
	4	3.48880	0.0098			4	1.93836	0.1082	
	5	4.55954	0.0008			5	2.14918	0.0641	
	6	3.38537	0.0041			6	2.36289	0.0342	
	7	2.79654	0.0100			7	2.62799	0.0148	
	8	2.04408	0.0474			8	3.10316	0.0034	
	9	1.66590	0.1059			9	2.84921	0.0047	
	10	1.81937	0.0658			10	3.00552	0.0022	
	11	2.07157	0.0289			11	1.83816	0.0568	
	12	1.98653	0.0331			12	2.26094	0.0140	
Ho: LCHI_TCF does not Granger cause LMAL_TCF	1	1.77197	0.1854	LCHI_TCF → LMAL_TCF					
	2	1.33232	0.2674						
			0.1650						
	3	1.72593	0.1057						
	4	1.95418	0.2001						
	5	1.48353	0.1354						
	6	1.66573	0.1986						
	7	1.43337	0.2309						
	8	1.34057	0.2335						
	9	1.32273	0.2518						
	10	1.27861	0.2769						
	11	1.23005	0.2042						
	12	1.34794							

Table 5
Granger causality Wald test with Cyclical Components.

Hypothesis	Lags	*F*-statistic	Prob > F	Conclusion	Hypothesis	Lags	*F*-statistic	Prob > F	Conclusion
Ho: LCHI_C2CF does not Granger cause LKOR_ C2CF	1	8.29080	0.0046	LCHI_C2CF → LKOR_ C2CF	Ho: LCHI_ C2CF does not Granger cause LUSA_ C2CF	1	4.52852	0.0352	LCHI_C2CF → LUSA_ C2CF
	2	5.44278	0.0054			2	15.8625	0.0000	
	3	26.1216	0.0000			3	30.4252	0.0000	
	4	38.3638	0.0000			4	55.9112	0.0000	
	5	24.9560	0.0000			5	50.4807	0.0000	
	6	134.707	0.0000			6	85.6234	0.0000	
	7	25.2470	0.0000						
Ho: LCHI_ C2CF does not Granger cause LJPN_ C2CF	1	3.25674	0.0734	LCHI_C2CF → LJPN_ C2CF	Ho: LCHI_ C2CF does not Granger cause LTWN_ C2CF	1	0.42111	0.5175	LCHI_C2CF → LTWN_ C2CF
	2	6.34155	0.0024			2	46.2471	0.0000	
	3	10.9427	0.0000			3	35.3423	0.0000	
	4	13.3409	0.0000			4	155.890	0.0000	
	5	20.8179	0.0000			5	356.131	0.0000	
	6	33.2368	0.0000			6	339.281	0.0000	
	7	38.3700	0.0000			7	54.0811	0.0000	
Ho: LCHI_ C2CF does not Granger cause LMAL_ C2CF	1	5.08729	0.0257	LCHI_C2CF → LMAL_ C2CF					
	2	11.1988	0.0000						
	3	77.3389	0.0000						
	4	27.8968	0.0000						
	5	52.9688	0.0000						
	6	565.524	0.0000						

Table 6
Estimations of the short-term effect of Chinese tourists on tourist demand from other markets.

Dependent Variable	Z test Coefficient	F test	Kleibergen-Paap rk L.M. statistic ($\chi 2$) (Ho: The structural equation is underidentified)	*P*-value	Kleibergen-Paap rk Wald F statistic	Stock-Yogo weak I.D. test critical values (maximal LIML size):				Hansen J statistic (Ho: All instruments are valid)	*P*-value	Endogeneity test (Ho: Variables are exogenous)	*P*-value
						10 %	15 %	20 %	25 %				
LKOR_C2CF	2.2085**	5.98**	20.693	0.0080	4.091	3.97	3.04	2.63	2.39	11.987	0.1010	1.670	0.1962
LJPN_C2CF	2.6956*	3.33*	18.399	0.0053	4.805	4.45	3.34	2.87	2.61	7.435	0.1903	0.117	0.7319
LTWN_C2CF	0.4084***	18.58***	41.327	0.0000	28.591	4.84	3.56	3.05	2.77	0.702	0.9511	0.273	0.6013
LUSA_C2CF	0.3283**	5.15**	39.638	0.0000	27.417	4.84	3.56	3.05	2.77	5.179	0.2695	0.004	0.9511
LMAL_C2CF	1.8394*	3.31**	22.620	0.0071	3.858	3.81	2.93	2.54	2.32	10.627	0.2238	1.466	0.2260

***1 %, **5 %, *10 % significant levels.

current tourism capacity might keep up with China's growth and other inbound markets. Vietnamese Government has gradually paid more attention to the tourism industry by building political, financial, and legal institutions and providing essential services and infrastructure necessary for tourism (Truong & Le, 2017). Therefore, tourists from five considering countries might not perceive the shortage in tourism services and be crowded out by Chinese tourists' current density at Vietnam destinations. Second, the rapid soar in Chinese tourists' number helps Vietnam reach third place among the ten fastest-growing travel destinations worldwide in 2017 (UNWTO, 2018). As a result, Vietnam has increasingly become a popular destination attracting more international visitors from other countries like South Korea, Japan, Taiwan, the United States, and Malaysia, consistent with Petr (2009) that crowding is an indicator of a destination's reputation.

The F test and Z coefficient results in Table 7 demonstrate that Chinese travelers constantly had positive effects in the long run on tourists from most of the selected market segments, except for South Korea, which came out negative, rejecting hypotheses 2b, 2c, 2d, and 2e. These findings, again, confirm the presence of crowding-in effects between tourist segments which differs from the results of prior studies (Chou et al., 2014; Su et al., 2012). These outcomes also confirm Vietnam's sufficient competence in meeting higher tourism demand in the long run and no significant evidence of the fierce competition or the crowding-out effect among tourist segments in Vietnam. Furthermore, the rising reputation of Vietnam destinations generated by many Chinese tourists annually will provide a high chance to appeal to travelers

Table 7
Estimations of the long-term effect of Chinese tourists on tourist demand from other markets.

Dependent Variable	Z test Coefficient	F test	Kleibergen-Paap rk L.M. statistic ($\chi 2$) (Ho: The structural equation is underidentified)	*P*-value	Kleibergen-Paap rk Wald F statistic	Stock-Yogo weak I.D. test critical values (maximal LIML size):				Hansen J statistic (Ho: All instruments are valid)	*P*-value	Endogeneity test (Ho: Variables are exogenous)	*P*-value
						10 %	15 %	20 %	25 %				
LKOR_TCF	−0.2563*	2.77*	26.977	0.0046	5.682	3.58	2.76	2.40	2.19	15.886	0.1030	2.692	0.1009
LJPN_TCF	0.5037*	3.36*	19.732	0.0062	7.563	4.18	3.18	2.73	2.49	4.190	0.6510	1.326	0.2494
LTWN_TCF	0.9912***	538.01***	34.174	0.0000	23.469	6.46	4.36	3.69	3.32	0.138	0.9333	1.006	0.3158
LUSA_TCF	1.0116**	3.87*	13.325	0.0040	10.660	6.46	4.36	3.69	3.32	4.472	0.1069	1.791	0.1808
LMAL_TCF	0.9504***	304.32***	10.268	0.0164	10.580	6.46	4.36	3.69	3.32	1.205	0.5474	0.058	0.8097

***1 %, **5 %, *10 % significant level.

from other countries. This result likely aligns with the Vietnam Tourism Development Strategy to 2030 signed in January 2020, which targets 50 million tourist arrivals in 2030, 8–10 % of annual growth, and focuses on North-East Asia, South East Asia, Australia, North America, and Europe areas (VNAT, 2020).

The results support hypothesis 2a by identifying the crowding-out effect that Chinese tourists pose on the South Korea segment in the long run ($F = 2.77$; $p < 0.1$; $b = -0.2563$), consistent with Chou et al. (2014). This result is explainable since China and South Korea are currently the first and second-largest inbound tourist markets of Vietnam in recent years, which occupy 32.24 % and 23.83 % of the total arrivals in 2019 (VNAT, 2019). Every fluctuation in one of these two dominating markets can leave a great impact on the other. Secondly, the prior literature shows that there are similarities in traveling preferences between Chinese and Korean tourists. According to Chen and Hsu (2000), Korean visitors are likely attracted by natural and scenic beauty, architectural uniqueness, and similar lifestyles, which Chinese travelers find most interesting (Kim, Guo, & Agrusa., 2005). Sharing the same tourism product categories, Korean tourists would compete with Chinese visitors in consuming tourism services, which is inherently limited, causing their dissatisfaction and decision to choose other destinations. Moreover, Chen and Hsu (2000) indicate that Korean tourists likely make traveling-related decisions based on their evaluation of the environmental friendliness of destinations that might be threatened by overcrowds. They might be more sensitive to Chinese travelers' excessive density than tourists from other countries, leading to their avoidance of overcrowded destinations in Vietnam in the long run.

6. Conclusion

This study examines the effects of tourists from China on tourists from the other five selected segments to Vietnam destinations to address whether crowding-out or crowding-in effects exist among tourists. Unlike expectation, the study reveals the presence of crowding-out and crowding-in effects of Chinese tourists on tourists from considering segments in the short-and-long run (Fig. 4). More specifically, the study shows that the increasing number of Chinese tourists visiting Vietnam stimulates four tourist segments, including Japan, Taiwan, the United States, and Malaysia. The results also investigate that the Chinese tourist market positively impacts the South Korean segment in the short term but negatively affects the South Korean tourist segment in the long term. These findings offer different conclusions from previous studies, suggesting substantial implications to both existing literature and policymakers.

From the managerial perspective, the study results provide several practical suggestions to Vietnam's policymakers. First, the study confirms the crowding-out effect between China and South Korea segments in the long term. Vietnam's destination managers should offer more investment in supporting facilities and services specifically for the South Korean segment to prevent this congestion effect. In addition, tourism practitioners should improve destination planning and management competence, developing and allocating tourism products enticing these two tourist segments to different physical areas. Policymakers can also promote marketing campaigns that attract Chinese and South Korean tourists in off-peak seasons or different periods. Second, the crowd of

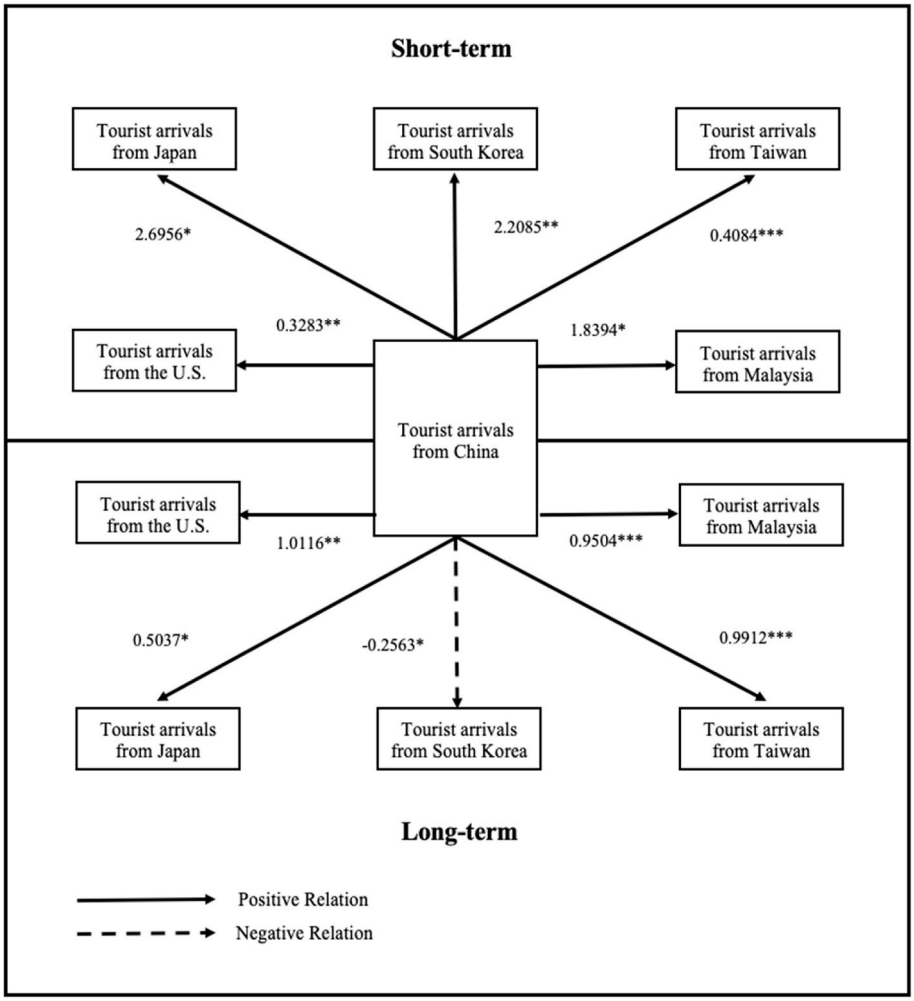

Fig. 4. The long-term and short-term effects of Chinese arrivals on tourist demand from five selected countries to Vietnam.

tourists from China was found to be an engine of growth for the tourist demand from other market segments, including Japan, Taiwan, the United States, and Malaysia in the long-run due to the increasingly high tourism reputation the Chinese segment brings Vietnam. As the preferences of tourists from long-haul and short-haul markets on tourism services are distinctive (Vu, Li, Law, & Ye, 2015), tourism practitioners should develop different travel routes for these tourist segments to meet the diversified demands of markets but also alleviate the crowding pressure. Furthermore, prior studies have indicated that Chinese outbound tourism is not market-driven but politically oriented (Lin & Lee, 2020). The latter means that any degradation in China's reciprocal relationship and a specific country may trigger a substantial decline in the number of Chinese tourist arrivals to that country. Therefore, while Vietnam's policymakers may enhance the popularity and attract foreign travelers by continuously expanding China's tourist segment, they should eliminate dependence on this segment and strengthen their tourism reputation by advancing quality over quantity and diversifying tourism products that specialize in various countries' needs.

From the theoretical perspective, the study generalizes previous findings by confirming the crowding-out phenomenon among China and South Korea tourist segments in Vietnam destinations, meaning that market interaction can determine tourist demand. In addition, while different crowding-out effects were predicted by various perceptions of crowding across cultures (Schuckert & Wu, 2021), this study shows that Eastern versus Western cultures do not necessarily explain whether another would crowd out a national tourist segment. Specifically, the study indicates a significant crowding-out effect on tourists from an Eastern country (e.g., South Korea), whereas significant crowding-in effects are found in other Eastern and Western countries (e.g., Japan, Taiwan, Malaysia, and the United States). The study emphasizes the role of tourist traveling preference and size of tourist segment rather than culture difference in eliciting crowding-out effect between two segments. Furthermore, the study contributes to the existing literature of crowding's impact by suggesting that a tourist segment may crowd in another by increasing the destination's reputation. Finally, as some econometric approaches have been employed in crowding effect research, including the seasonal ARIMA model (Su et al., 2012) and Generalized Measure of Moment (Lin & Lee, 2020), this study offers a new approach by applying the LIML methods to estimate the short-and-long-term impacts which have not been used in prior studies.

The main limitation of the current study stems from problems in data availability. The data deficiency excludes European countries like Russia or the United Kingdom, usually in the top ten markets having the greatest number of international arrivals to Vietnam in years. The limitation in the considered period also prevented a more precise analysis of the tourism demand in Vietnam. For instance, the study is limited, considering the impact of this pandemic on tourism demand, as the latter is still an ongoing event.

The current study can be extended by examining the impact of a tourist segment on European segments and contrasting it with Asia and North American areas or the impact of international tourists on the domestic segment, specifically in certain regions or cities. Besides, future studies can better understand the crowding-out and crowding-in effects in tourism demand by generalizing the findings to other high-density destinations or comparing between developed and developing tourism contexts. Further cross-sectional research can improve our knowledge by considering the impacts of tourist traveling preference and tourist segment size that might explain crowding-out and crowding-in effects among tourist segments. Finally, Dogru-Dastan (2020) indicates that more studies should address how crowding influences tourists' perceptions of a destination. This study's findings imply the role of crowding in promoting the reputation of a developing tourism destination, suggesting forthcoming research to examine crowding's impacts on visitors' perceived destination's images.

Authorship contributions

Please indicate the specific contributions made by each author (list the authors' initials followed by their surnames, e.g., Y.L. Cheung). The name of each author must appear at least once in each of the three categories below.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

Abrams, B. A., & Schitz, M. D. (1978). The 'crowding-out' effect of governmental transfers on private charitable contributions. *Public Choice, 33*(1), 29–39.
Afonso, A., & St Aubyn, M. (2009). Macroeconomic rates of return of Public and Private investment: Crowding-in and Crowding-out effects. *The Manchester School, 77*, 21–39.
Ahmed, H., & Miller, S. M. (2000). Crowding-out and crowding-in effects of the components of government expenditure. *Contemporary Economic Policy, 18*(1), 124–133.
Andereck, K. L., & Nyaupane, G. P. (2011). Exploring the nature of tourism and quality of life perceptions among residents. *Journal of Travel Research, 50*(3), 248–260.
Arnberger, A., & Brandenburg, C. (2007). Past on-site experience, crowding perceptions, and use displacement of visitor groups to a peri-urban national park. *Environmental Management, 40*(1), 34–45.
Arnberger, A., & Haider, W. (2007). Would you displace? It depends! A multivariate visual approach to intended displacement from an urban forest trail. *Journal of Leisure Research, 39*(2), 345–365.
Arnberger, A., & Mann, C. (2008). Crowding in European forests: A review of recent research and implications for forest management and policy. *Forestry, 81*(4), 559–571.
Bajada, T., & Titheridge, H. (2017). The attitudes of tourists towards a bus service: Implications for policy from a Maltese case study. *Transportation Research Procedia, 25*, 4110–4129.
Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control* (2nd ed.). Academic Press.
Bresson, G., & Logossah, K. (2011). Crowding-out effects of cruise tourism on stay-over tourism in the Caribbean: Non-parametric panel data evidence. *Tourism Economics, 17*(1), 127–158.
Brown, A., Kappes, J., & Marks, J. (2013). Mitigating theme park crowding with incentives and information on mobile devices. *Journal of Travel Research, 52*(4), 426–436.
Chen, J. S., & Hsu, C. H. (2000). Measurement of Korean tourists' perceived images of overseas destinations. *Journal of Travel Research, 38*(4), 411–416.
Chou, C. M., Hsieh, S. F., & Tseng, H. P. (2014). The crowding-out effects of Chinese tourists on inbound tourism in Taiwan. *Tourism Economics, 20*(6), 1235–1251.
Christiano, L. J., & Fitzgerald, T. J. (2003). The band pass filter. *International Economic Review, 44*(2), 435–465.
Dean, L. M., Pugh, W. M., & Gunderson, E. E. (1978). The behavioral effects of crowding: Definitions and methods. *Environment and Behavior, 10*(3), 419–431.
Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*(366a), 427–431.
Dogru-Dastan, H. (2020). A chronological review on perceptions of crowding in tourism and recreation. *Tourism Recreation Research*, 1–21.
Dowling, R. K. (Ed.). (2006). *Cruise ship tourism*. Wallingford: CABI.
Dwyer, L., Forsyth, P., Madden, J., & Spurr, R. (2000). Economic impacts of inbound tourism under different assumptions regarding the macroeconomy. *Current Issues in Tourism, 3*(4), 325–363.
Elliott, G., Rothenberg, T., & Stock, J. (1996). Efficient tests for an autoregressive unit root. *Econometrica, 64*(4), 813–836.
Engle, R., & Granger, C. (1987). Co-integration and error correction: Representation, estimation, and testing. *Econometrica, 55*(2), 251–276.
Ferreira, J. P., Ramos, P. N., & Lahr, M. L. (2019). The rise of the sharing economy: Guesthouse boom and the crowding-out effects of tourism in Lisbon. *Tourism Economics*, 1–15.
Fleishman, L., Feitelson, E., & Salomon, I. (2007). Behavioural adaptations to crowding disturbance: Evidence from nature reserves in Israel. *Leisure Sciences, 29*(1), 37–52.
Fourie, J., & Santana-Gallego, M. (2011). The impact of mega-sport events on tourist arrivals. *Tourism Management, 32*(6), 1364–1370.
Goeldner, C. R., & Ritchie, J. B. (2007). *Tourism principles, practices, philosophies*. New Jersey: John Wiley & Sons.
Gonzalez, V. M., Coromina, L., & Galí, N. (2018). Overtourism: Residents' perceptions of tourism impact as an indicator of resident social carrying capacity-case study of a Spanish heritage town. *Tourism Review, 73*(3), 277–296.
Granger, C. (1986). Developments in the study of cointegrated variables. *Oxford Bulletin of Economics & Statistics, 48*(3), 213–228.
Gujarati, D. (2014). *Econometrics by example*. New York: Palgrave Macmillan.
Hayashi, F. (2000). *Econometrics*. New Jersey: Princeton University Press.

Hui, M. K., & Bateson, J. E. (1990). Testing a theory of crowding in the service environment. *ACR North American Advances, 17*, 866–873.
Hwang, J., Yoon, S., & Bendle, L. (2012). Desired privacy and the impact of crowding on customer emotions and approach- avoidance responses. *International Journal of Contemporary Hospitality Management, 24*(2), 224–250.
Jacobsen, J. K. S. (2000). Anti-tourist attitudes: Mediterranean charter tourism. *Annals of Tourism Research, 27*(2), 284–300.
Jacobsen, J. K. S. (2002). Southern comfort: A study of holiday style patterns of northerners in coastal Mallorca. *Scandinavian Journal of Hospitality and Tourism, 2*(1), 49–78.
Jin, Q., Hu, H., & Kavan, P. (2016). Factors influencing perceived crowding of tourists and sustainable tourism destination management. *Sustainability, 8*(10), 976–993.
Jin, Q., & Pearce, P. (2011). Tourist perception of crowding and management approaches at tourism sites in Xi'an. *Asia Pacific Journal of Tourism Research, 16*(3), 325–338.
Jurado, E. N., Damian, I. M., & Fernández-Morales, A. (2013). Carrying capacity model applied in coastal destinations. *Annals of Tourism Research, 43*, 1–19.
Khanh Hoa Department of Tourism. (2019). Results of Khanh Hoa tourism business in november 2019. Retrieved from https://sdl.khanhhoa.gov.vn/?ArticleId=2c753c47-1206-44df-8604-969d7fc50ee6.
Kim, S. S., Guo, Y., & Agrusa, J. (2005). Preference and positioning analyses of overseas destinations by mainland Chinese outbound pleasure tourists. *Journal of Travel Research, 44*(2), 212–220.
Kim, D., Lee, C. K., & Sirgv, M. J. (2016). Examining the differential impact of human crowding versus spatial crowding on visitor satisfaction at a festival. *Journal of Travel & Tourism Marketing, 33*(3), 293–312.
Kim, D. Y., & Park, S. (2008). Customers' responses to crowded restaurant environments: Cross-cultural differences between American and Chinese. *Journal of Hospitality & Leisure Marketing, 16*(1–2), 137–157.
Kirchgessner, M. L., & Sewall, B. J. (2015). The impact of environmental, social, and animal factors on visitor stay times at big cat exhibits. *Visitor Studies, 18*(2), 150–167.
Klanjšček, J., Geček, S., Marn, N., Legović, T., & Klanjšček, T. (2018). Predicting perceived level of disturbance of visitors due to crowding in protected areas. *PLoS One, 13*(6), 1–16.
Koh, E. (2020). The end of over-tourism? Opportunities in a post-covid-19 world. *International Journal of Tourism Cities, 6*(3), 1015–1023.
Lin, C. Y., & Lee, M. (2020). Taiwan's opening policy to Chinese tourists and cross-strait relations: The impacts on inbound tourism into Taiwan. *Tourism Economics, 26*(1), 27–44.
Manning, R. E., & Valliere, W. A. (2001). Coping in outdoor recreation: Causes and consequences of crowding and conflict among community residents. *Journal of Leisure Research, 33*(4), 410–426.
Marušić, Z., Horak, S., & Tomljenović, R. (2008). The socioeconomic impacts of cruise tourism: A case study of Croatian destinations. *Tourism in Marine Environments, 5*(2–3), 131–144.
Mattila, A. S., & Hanks, L. (2012). Time styles and waiting in crowded service environments. *Journal of Travel & Tourism Marketing, 29*(4), 327–334.
Mowen, A. J., Vogelsong, H. G., & Graefe, A. R. (2003). Perceived crowding and its relationship to crowd management practices at park and recreation events. *Event Management, 8*(2), 63–72.
Moyle, B., & Croy, G. (2007). Crowding and visitor satisfaction during the off-season: Port campbell national park. *Annals of Leisure Research, 10*(3–4), 518–531.
Neuts, B., & Nijkamp, P. (2012). Tourist crowding perception and acceptability in cities: An applied modelling study on Bruges. *Annals of Tourism Research, 39*(4), 2133–2153.
Neuts, B., Nijkamp, P., & Van Leeuwen, E. (2012). Crowding externalities from tourist use of urban space. *Tourism Economics, 18*(3), 649–670.
Petr, C. (2009). Fame is not always a positive asset for heritage equity! Some clues from buying intentions of national tourists. *Journal of Travel & Tourism Marketing, 26*(1), 1–18.
Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*(2), 335–346.
Poi, B. P. (2006). Jackknife instrumental variables estimation in Stata. *STATA Journal, 6*(3), 364–376.
Rode, J., Gómez-Baggethun, E., & Krause, T. (2015). Motivation crowding by economic incentives in conservation policy: A review of the empirical evidence. *Ecological Economics, 117*, 270–282.
Schmidt, D. E., & Keating, J. P. (1979). Human crowding and personal control: An integration of the research. *Psychological Bulletin, 86*(4), 680–700.
Schuckert, M., & Wu, J. S. (2021). Are neighbor tourists more sensitive to crowding? The impact of distance on the crowding-out effect in tourism a research paper submitted to the tourism management. *Tourism Management, 82*, 104185.
Shelby, B., & Heberlein, T. A. (1984). A conceptual framework for carrying capacity determination. *Leisure Sciences, 6*(4), 433–451.
Sloboda, B. W., & Yao, V. W. (2008). Interstate spillovers of private capital and public spending. *The Annals of Regional Science, 42*(3), 505–518.
Song, H., Dwyer, L., Li, G., & Cao, Z. (2012). Tourism economics research: A review and assessment. *Annals of Tourism Research, 39*(3), 1653–1682.
Song, H., Witt, S., & Li, G. (2009). *The advanced econometrics of tourism demand*. New York, NJ: Routledge.
Stock, J. H., Wright, J. H., & Yogo, M. (2002). A survey of weak instruments and weak identification in generalized method of moments. *Journal of Business & Economic Statistics, 20*(4), 518–529.
Stokols, D. (1972). On the distinction between density and crowding: Some implications for future research. *Psychological Review, 79*(3), 275–277.
Su, Y. W., Lin, H. L., & Liu, L. M. (2012). Chinese tourists in Taiwan: Crowding out effects, opening policy and its implications. *Tourism Management Perspectives, 4*, 45–55.
Truong, T.-H., & King, B. (2009). An evaluation of satisfaction levels among Chinese tourists in Vietnam. *International Journal of Tourism Research, 11*, 521–535.
Truong, V. D., & Le, A. (2017). The evolution of tourism policy in Vietnam, 1960–2015. *The routledge handbook of tourism in Asia* (pp. 191–204).
Tseng, M. L., Wu, K. J., Lee, C. H., Lim, M. K., Bui, T. D., & Chen, C. C. (2018). Assessing sustainable tourism in Vietnam: A hierarchical structure approach. *Journal of Cleaner Production, 195*, 406–417.
United National World Tourism Organization (UNWTO). (2018). Tourism highlights. Retrieved from https://www.e-unwto.org/doi/pdf/10.18111/9789284419876.
Vietnam National Administration of Tourism (VNAT). (2019). Vietnam tourism 2018 in numbers. Retrieved from http://www.vietnamtourism.gov.vn/english/index.php/items/14214.
Vietnam National Administration of Tourism (VNAT). (2020). Vietnam tourism development strategy to 2030. Retrieved from http://www.vietnamtourism.gov.vn/index.php/cat/2501.
Vilnai-Yavetz, I., & Levina, O. (2018). Motivating social sharing of e-business content: Intrinsic motivation, extrinsic motivation, or crowding-out effect? *Computers in Human Behavior, 79*, 181–191.
Vu, H. Q., Li, G., Law, R., & Ye, B. H. (2015). Exploring the travel behaviors of inbound tourists to Hong Kong using geotagged photos. *Tourism Management, 46*, 222–232.
Wang, J., Huang, X., Gong, Z., & Cao, K. (2020). Dynamic assessment of tourism carrying capacity and its impacts on tourism economic growth in urban tourism destinations in China. *Journal of Destination Marketing and Management, 15*, 100383.
Wang, J. N., Wan, Y. K., & Dong, S. C. (2014). Analysis on the crowding-out effect of tourism and regional differences. *Applied Mechanics and Materials, 522*, 1581–1589.
Wooldridge, J. (2013). *Introductory econometrics: A modern approach* (6th ed.). Boston, MA: Cengage Learning.
Yang, C. H., & Lo, P. L. (2018). How the influx of Chinese tourists affects national tourism behaviors: Evidence from Taiwan. *International Journal of Tourism Research, 20*(5), 543–553.
Yeh, S. S., Wai Aliana, L. M., & Zhang, F. Y. (2012). Visitors' perception of theme park crowding and behavioral consequences. In J. S. Chen (Ed.), *Advances in hospitality and leisure* (Vol. 8, pp. 63–83).
Yin, J., Cheng, Y., Bi, Y., & Ni, Y. (2020). Tourists perceived crowding and destination attractiveness: The moderating effects of perceived risk and experience quality. *Journal of Destination Marketing & Management, 18*, 100489.
Zehrer, A., & Raich, F. (2016). The impact of perceived crowding on customer satisfaction. *Journal of Hospitality and Tourism Management, 29*, 88–98.