SPATIAL STRUCTURE OF TOURISM: AN APPLICATION OF NEW ECONOMIC GEOGRAPHY IN SELECTED COUNTRIES

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Assessing the spatial structure of tourism in selected countries during the period 1995-2010 is the main purpose of current paper. To reach this, through applying new economic geography, some spatial factors affecting on tourism agglomeration have been evaluated using panel data. The results of model estimation indicated that the economies of scale and the tourism cost are the most important factors in determining tourism agglomeration in selected countries. In addition, growth and development level of countries increase the tourism agglomeration in these countries. Also, based on this study results, maintain credibility in satisfaction of tourists increase the tourism agglomeration.Overall, the results of this study indicate the confirmation of new economic geography factors in determining tourism agglomeration, while previous studies are just considered the economic factors affecting on tourism agglomeration

**Keywords:** *Tourism, New Economic Geography, Panel Data.*

JEL Classification: *L83, M1, O1*

INTRODUCTION

Rapid growth of tourism industry after 1950s is one of the main and important characteristic of tourism industry. So, according to statistics of World Tourism Organization (WTO, 2012), the number of tourists across the world was 25.3 million in 1950 which increased into a noticeable number 940 million individuals in 2010. This represents about 38 times increasing of tourists during mentioned time. Figure (1) presents the trend of the number of international tourists in the world during 1995-2010.

Figure 1 The trend of the number of international tourists in the world during 1995-2010
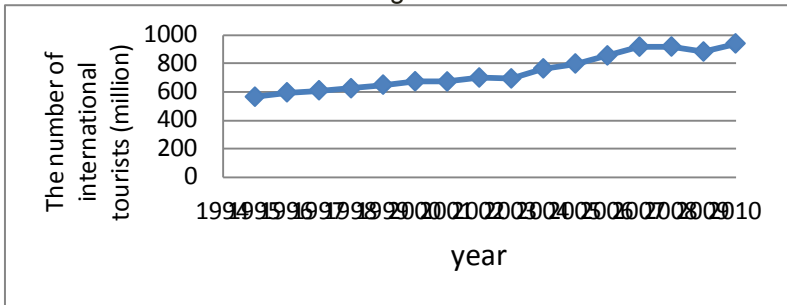
Source: Based on World Tourism Organization Statistics (2012)

As can be seen figure (1) generally indicates the upward trend of international tourist numbers. While according to the statistics of World Tourism Organization, tourism activities and its incomes are not distributed equally across the world. Certainly we can say that the share of developed countries in tourism income is higher than the developing countries (WTO, 2012). For more reviews, figure (2) presents spatial structure of tourism activities for 2010.

Figure 2 Spatial Structure of tourism activities for 2010
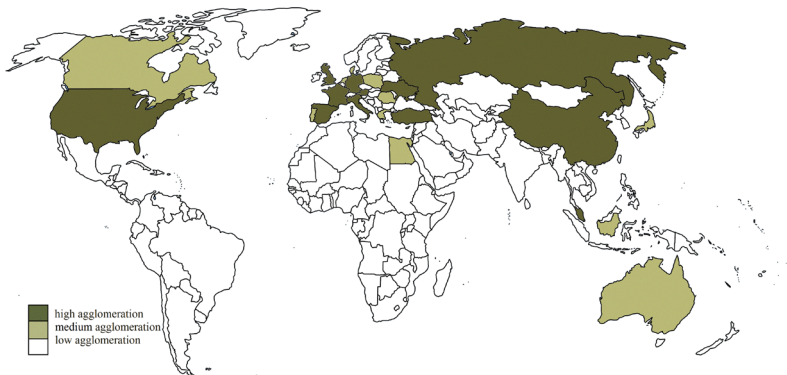
Source: Present research

In figure (2), numbers of tourists higher than 15 million is considered as high tourism agglomeration, 5 to 15 million as medium agglomeration and lower than 5 million tourists as lower agglomeration.

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As observed in this figure, developed countries like France, United States, Italia, Spain, Canada, Austria and Portugal are in the category of high and medium tourism agglomeration in 2010.

Table 1 The number of international tourists, based on market size during the period 1995-2010

GDP (milliard dollars)	Time	Number of tourists (persons)
Low income (lower than 100)	1995- 2000	15333 - 7420333
	2000- 2005	8333 - 11982667
	2005-2010	30000 - 8479833
Medium income (100-500)	1995- 2000	916166 - 20010500
	2000- 2005	681500 - 22143167
	2005-2010	224166 - 21189833
High income (higher than 500)	1995- 2000	3790833 - 68246000
	2000- 2005	2949333 - 75645500
	2005-2010	4945833 - 77897833

Source: Present research

A Noticeable point about spatial structure of world economic activities is that some countries without any natural advantages have high economic activities and some other has poor economic activities despite higher natural advantages. So it seems some factors other than natural advantages can also determine the extent of economic activities in an area (Cirannek, 2009). Geographical variables are the factors among these which Krugman (1991) investigated them in the context of New Economic Geography (NEG). In framework of new economic geography (NEG), location has a close relationship with firm' profitability and in this regard the firms are trying to place near the markets (Krugman, 1999). Obviously, proximity to consumer markets increases economic activity (Farmanesh, 2009). In terms of spatial distribution of tourism activities, it seems that in addition to factors like accessing to sea, appropriate climate, historical works in countries with high tourism agglomeration, accessing to larger markets, economies of scale, tourism costs and level of development are important. In this regard, tables (1) and (2) present the

number of international tourists, respectively, based on market size and development level during 1995-2010.

As can be seen in table (1), during time period of 1995-2010, the number of tourists is higher in countries with larger market (GDP). So it seems that economies of scale have positive effect on spatial distribution of tourism activities. Also, according to table (2), tourism agglomeration in higher developed countries is higher which indicates the decisive role of development level on tourism activities distribution.

Table 2 The number of international tourists, based on development level during the period 1995-2010

Level of development (HDI)	Time	Number of tourists (persons)
Low development (lower than 0.45)	1995- 2000	15333 - 891000
	2000- 2005	8333 - 1017167
	2005-2010	30000 - 1425333
Medium development (0.45-0.65)	1995- 2000	22166 - 24986333
	2000- 2005	20000 - 37123167
	2005-2010	11833 - 10960167
High development (higher than 0.65)	1995- 2000	77663 - 68246000
	2000- 2005	67833 - 75645500
	2005-2010	98833 - 77897833

Source: Present research

Regarding to the lack of equal distribution of tourism activities in the world, assessing the spatial structure of this important activity is essential. Specifically the question is that why the tourism activities are unequally distributed? To reply this question, some new economic geography factors along with economic factors are also considered and tourism agglomeration function in selected countries during the time series of 1995-2010 is estimated based on new economic geography model by using Panel model.

It is necessary to mention this important issue that a study which considers the spatial structure of world tourism is not yet observed. But there are several studies about the estimation of tourism demand. An example can be Akis (1998) pointed out who examined the relationship

between Turkey tourism demand and national income of origin countries and also the relative prices by using the time period information of 1930-1980. The results of this research indicate the existence of a negative relationship between Turkey tourism demand and relative prices and also a positive relationship between the demand and national income of origin countries. Furthermore, through using Ordinary Least Square (OLS), Halicioglu (2004) estimated Turkey tourism demand function through time series data of 1960-2002 by using Autoregressive distributed lag model (ARDL) and indicated that income is a significant variable in explaining the number of tourists' arrival into Turkey. Garin (2007) estimated Spain tourism demand function by using Panel data of 17 Spain destinations during time series of 1991-2003 and reached this conclusion that tourism demand has high dependency to the former period demand, relative prices and transportation cost to travel between the origin and the destination. Chaiboonsri and Chaitip (2009), by using the cointegration and unit root methods in Panel data, modeled the tourism demand in Thailand during 1986-2007 and indicated that Gross Domestic Product (GDP) growth in Asian markets increases the tourism demand for Thailand. Yang (2012) evaluated the relationship between agglomeration and development of tourism for 31 provinces of China during 2000-2009. Through using Panel data, Yang concluded that tourism industry agglomeration has a positive effect on tourism development. Villalobos-Céspedes, et al. (2012) analyzed the influence of socio demographic and travel indicators on international demand for natural-based tourism in Costa Rica. The results obtained from this research show the favourable influence on demand of variables such as family, country of origin, providing orientation for policies and strategies of the nature-based tourism in Costa Rica, as well as indicators for other countries interested in developing this sector. Petrevska (2013) estimated tourism demand by using two methods including the method of exponential smoothing and the Box-Jenkins methodology. The result of the research is a medium-term estimation of foreign tourism demand for destinations in the Former Yugoslav Republic of Macedonia (FYROM) by the end of 2014.

In the rest of the paper and after the introduction, in the second part, a theoretical background is presented. Third section is devoted to specify and estimate the model and analyze the results. Fourth part presents the summery and conclusion. Resources and references are presented in the final.

LITERATURE REVIEW

During two last decades, economic activities distribution in space was considered as New Economic Geography (NEG). Economic new geography has been developed by neoclassical economists (krugman, 1991) and its topic is unequal distribution of economic activities as the outcome of universal processes of agglomeration (Boschma and Frenken, 2006). Generally, causes of agglomeration has two natures; in primary nature, it means relative advantageous (natural advantageous, resources, supplies, infrastructures, climate and so on) and in secondary nature of agglomeration which is developed by New Economic Geography models (Fujita and Mory, 2005), pecuniary externalities (like Market Size) and non-pecuniary externalities (like knowledge) are discussed (Marques, 2004). So agglomeration cumulative causation is formed by using NEG elements. In context of new trade models and also new economic geography, main infrastructure and assumptions of agglomeration cumulative causation include: 1.Increasing Returns of Scale (IRS), 2.Imperfect competition market structure, 3.Trade costs, 4.Firm endogenous location and 5.Demand endogenous location. These four assumptions create home-market effect (HME) of Krugman (1980) which have an important role in creating the agglomeration. In summary, we can say that areas with higher demand for industries are tended to larger industrial section because of home-market effect. Therefore, agglomeration by Circular Causation causes agencies place near the big markets.

Also, Cluster Theory can provide a conceptual framework for a better understanding of the complex agglomeration (Porter, 1998). Porter (1998) defines a cluster as: "a geographic concentration of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition." the larger the number of firms in one region, the more the firms can benefit from easy access to raw materials and local markets; therefore, firms tend to cluster geographically (Chen et. al, 2008). Also, Firms tend to agglomerate where the regional market size is large (Chen et. al, 2008).

Tourism industry is a combination of activities, services and different industries which leads to a trip experiment. This industry includes transformation, accommodation, feeding, retailing, tour operators, travel agents, entertainment, attractions and hospitality services which are under the control of different individuals or groups who are traveling outside of their home country. According to Porter's (1998) definition, tourism agglomeration can be defined as "geographic concentrations of

interconnected tourism enterprises, firms in related industries, and associated institutions in related fields that cooperate but also compete". (Yang, 2012).

So, scale economies are considered, according to the "new economic geography", as the incentives of agglomeration (Yang, 2012). Regarding to new economic geography framework, countries with larger market size, have higher ability to produce productions with feature of increasing returns to scale (IRS) (Krugman, 1980) and are able to produce more different products (Kenon, 1994). Increasing Returns to Scale (IRS) leads to a decrease in average cost, making the tourism industry more competitive. (Shi and Smyth, 2012). Therefore, market size has direct effect on economies of scale thus makes agglomeration. However, economies of Scale exist in the investment of infrastructure and reception facilities, marketing, and tourism resource protection of the destinations can attract more tourists (Jin and zhong2007).

Also, according to the theoretical basis of microeconomics, tourism demand function can be obtain through maximizing utility function regarding to budget restriction. To ease the discussion, we assume that in a condition of two goods, consumer uses tourism item $q_t^{tourism}$ and another item q_t^0 as the representative of other items and services. So tourism demand function will be obtained through maximizing utility function of consumer (which is a function of using two items of $q_t^{tourism}$ and q_t^0) and budget constraint as follows:

$$MAX : U = U(q_t^{tourism}, q_t^0) \tag{1}$$
$$s.t : Y_t^0 = p_t^{tourism}.q_t^{tourism} + p_t^0.q_t^0$$

After the formation of Lagrange function and the first order differentiation of Lagrange function to q_t^0 and $q_t^{tourism}$, tourism demand function can be obtained as follows:

$$q_t^{tourism} = f(Y_t^0, p_t^{tourism}, p_t^0) \tag{2}$$

Based on demand law in microeconomics, negative $p_t^{tourism}$ coefficient is expected. Therefore, tourism demand which commonly is calculated based on the number of arrival tourists or exchange revenue obtained from the tourism in destination country, is a function of tourism

price level in destination, price of other goods and income level (Mervar, 2007).

Economic development is also affective on tourism agglomeration. This variable is meant not only economic growth, but also reflects the structural, economic, social and cultural changes of community. Obviously, Development of demand-side reflects the potential demand of most of the countries for differentiated products (Balassa, Bauwens, 1997). Also, developed countries despite the slightly high demand for different products, are able to use economies of scale (Loertscher and Wolter, 1980). On supply- side, also, development level indicates the ability of supplying different products and the degree of economies of scale. The multiple and instant product supply for tourists' diverse demand leads to the satisfaction and a visitor's repetition behaviour (Petrick, 2002).

SPECIFYING AND ESTIMATING THE MODEL AND DATA ANALYZING

In this research, to examine the hypothesis and estimate the model, econometric method for panel data is used for 108 selected countries (Based on data availability) for time series of 1995-2010[2]. Current research econometric model is as follows:

$$\ln DEN_s = \alpha + \beta_1 \ln ES_s + \beta_2 \ln EX_s + \beta_3 \ln DVP_s + \beta_4 \ln HB_s + \varepsilon \quad (3)$$

Where, DEN_s is tourism agglomeration (The number of tourists in studied country to the total global tourists), ES_s is the relative economies of scale (market relative size), EX_s is the tourism cost (real Exchange rate), DVP_s is the relative development level (relative human development index) and HB_s is the behavioural expectations and habits (Previous time tourism agglomeration), all in s country.

Before estimating the model, it is necessary to examine the stationary of all variables used in estimations because non-stationary variables cause the problem of spurious regression. This research focused on four types of panel unit root tests such as Levin, Lin and Chu (LLC), Im, Pesaran and

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[2] . The names of the selected countries are presented in the Appendix.

shin (IPS), Phillips-Peron (PP) and Fisher-ADF. The results are presented in table (3).

Table 3 The unit root test of variables used in estimating the spatial structure of tourism in selected countries during the period 1995-2010

Tests Variables	LLC	IPS	ADF-FISHER	PP-FISHER
Tourism agglomeration (First differencing)	-33.72 (0.00)	-24.75 (0.00)	908.98 (0.00)	1096.49 (0.00)
Economies of scale (First differencing)	-24.13 (0.00)	-17.27 (0.00)	677.16 (0.00)	724.50 (0.00)
Tourism cost (First differencing)	-21.16 (0.00)	-14.52 (0.00)	581.94 (0.00)	611.23 (0.00)
Development (First differencing)	-18.25 (0.00)	-15.22 (0.00)	626.90 (0.00)	694.99 (0.00)

Source: Present research (Numbers in parentheses are the P-value).

The results in table (3) indicated that none of studied variables are non stationary level and all of them will be stationary through making one time difference. But, based on Kao-Cointegration Test presented in table (4), H_0 based on lack of agglomeration is rejected and non-spurious regression is approved.

Table 4 The cointegration test between variables used in research

Test	Statistic	P-value	Result
Kao- Co integration	-17.67	0.00	H_0 is rejected and the Co integration is approved

Source: Present research

Now in the following and to evaluate Panel model, first, according to the statistics of F-Limer, a selection performs between Panel data and Pooled data methods. H_0 of this statistic reflects the selection of Pooled

data method and its priority than Panel data. Regarding to the value of reported F in table (5), H_0 is rejected; therefore Panel data can be use in evaluating process. After making sure that model evaluating performed as Panel data, for selection fixed effects or fixed random is used Hausman test which its H_0 indicates the existence of random effects in model. According to the Hausman test statistic in table (5), H_0 is rejected and fixed effects model to evaluate the model is accepted.

Regarding to the results obtained from F-Limer and Hausman tests, model (3) is estimated by using fixed effects to evaluate the affective factors on tourism spatial structure in selected countries which results are presented in table (5).

Table 5 The spatial structure of tourism in selected countries during the period 1995-2010

variables	Coefficients	Statistic	P-Value
Constant	-0.3168	-4.3515	0.0000
$\ln ES_s$	0.0503	2.0537	0.0402
$\ln EX_s$	-0.0133	-1.9869	0.0471
$\ln DVP_s$	0.3257	2.3910	0.0169
$\ln HB_s$	0.8094	64.3889	0.0000
R^2	0.99		
F- Statistic	1738.09		
F-Limer	3.47	--	0.00
Hausman	181.48	--	0.00

Source: Present research

According to table (5), regression adjusted determination coefficient is equal with %99 thus, independent variables describe %99 of dependent variables changes. Also, common F test reflects that all of regression is

meaningful. According to the obtained results from this table, coefficient of market size is obtained positive and meaningful which is in accordance with new economic geography model. Also, the negative and meaningful effect of tourism cost on tourism agglomeration is in accordance with theory. According to this, high living costs in destination country performs as a deterrent factor for arrival of tourists. Therefore, we can say that economic, social and cultural development causes the attracting and increasing of tourism agglomeration in selected countries. Finally, the coefficient of expectations and behavioural habits variable, also, is evaluated according to positive and meaningful expectation, so maintain credibility causes tourism agglomeration.

SUMMARY AND CONCLUSIONS

The main purpose of this research is evaluating the affective factors on tourism spatial structure in selected countries by using Panel data method during time series of 1995-2010. Through review of past experimental studies, it can be observed that many of these studies evaluated tourism demand function by concentrating on demand part. Current research is one of small number researches which assess tourism agglomeration from both sides of supply and demand and uses and examines the new economic geography model.

According to the results of this research, economics of scale, tourism costs and development is effective on the spatial structure of tourism. Clearly, a relative amount of economics of scale has a direct and meaningful relationship with tourism agglomeration. Also, relative costs of tourism have a negative and meaningful effect on tourism agglomeration. In addition, development and also expectations and behavioural habits have positive and meaningful effect on tourism agglomeration in selected countries. Totally and regarding to the results of this study, it can be mentioned that:

- Increasing the productivity, economic growth and reaching to the economies of scales in tourism industry lead to providing various and different products of tourism with lower prices.

- Reaching to an appropriate level of economic development to provide the needs of this industry such as economic infrastructure includes roads, ports, terminals, air, see and land transportation facilities and providing other related elements to this industry like hotels, motels and restaurants can be the underlying of a sustainable development.

- In addition to diversifying and products differentiation, increasing human development scales, interaction between cultures and protecting

the environment, help country to reach to the goal of tourism sustainable development.

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APPENDIX

The names of the selected countries

Albania	Dominican	Korea, Rep.	Philippines
Algeria	Ecuador	Kuwait	Poland
Argentina	Egypt, Arab	Kyrgyz Republic	Portugal
Armenia	El Salvador	Lao PDR	Qatar
Australia	Estonia	Latvia	Romania
Austria	Ethiopia	Lithuania	Russian
Bahrain	Fiji	Luxembourg	Samoa
Bangladesh	Finland	Madagascar	Slovak Republic
Belarus	France	Malawi	Slovenia
Belgium	Georgia	Malaysia	Spain
Benin	Germany	Mali	Sudan
Bolivia	Ghana	Malta	Swaziland
Botswana	Greece	Mauritius	Sweden
Brazil	Guatemala	Mexico	Switzerland
Bulgaria	Guyana	Moldova	Togo
Burkina Faso	Honduras	Mongolia	Tonga
Burundi	Iceland	Morocco	Trinidad and
Cambodia	India	Nepal	Tunisia
Canada	Indonesia	Netherlands	Turkey
Central African Republic	Iran, Islamic	New Zealand	Uganda
China	Ireland	Niger	Ukraine
Colombia	Israel	Nigeria	United Kingdom
Congo, Dem. Rep.	Italy	Norway	United States
Congo, Rep.	Jamaica	Pakistan	Uruguay
Costa Rica	Japan	Panama	Vietnam
Cyprus	Jordan	Paraguay	Zambia
Denmark	Kenya	Peru	