

New Hotel Locations in the City of Irbid using 'Local Economies' and GIS Models

*Ahmad Makhadmih, Reem Alkharouf, Furat Almuhiessen, Abdulla Al-Shorman **

ABSTRACT

This study determines the best location of a new hotel in the city of Irbid based on the geographic location, price, capacity and services of established ones. With data on 11 hotels operating in the city of Irbid, a mathematical and GIS models were constructed to test the new location against agglomeration and differentiation economies. The findings of the study suggest that the new location may benefit from agglomeration but to a larger extent on differentiation. The GIS model suggests the southern part of the city as the best location for the new hotel. However, the provided services should be unique compared to rivals and at the same time at a comparable cost.

Keywords: Hotel location, Irbid, Jordan, local economies, GIS.

Introduction

The growth of hospitality industry in Jordan has been stretched out to include the northern border area -city of Irbid- as the flux of Syrian and Iraqi refugees put extra demand on the industry, mainly restaurants. In addition, the 'Arab Spring' in 2010 has contributed to the expansion of hospitality market in this area especially for tourists from the Arab Gulf region, where competitors' markets in the nearby countries have suffered the political and social instabilities (Al_Omari, et al. 2015). Accordingly, the need to establish new hotels and restaurants in the city of Irbid has increased. However, hospitality entrepreneurs are currently facing important decisions on where to establish new hotels and/or restaurants since hotel location is a long-term fixed investment, and a flawed location strategy can be very difficult to rectify. The decision should take into consideration that the demand is uncertain, and competition is segmented by geography especially in Jordan and the surrounding region, where the latter's tourism industry is currently impacted by politically instability (Basu and Marg 2012; Al-Shorman et al. 2016).

Hospitality industry is usually concentrated geographically around resources demand by tourists (Lee and Jang 2013, Pearce 1998), which tends to spatially agglomerate hotels (Marco-Lajara, et al. 2016). However, a successful hospitality business should have a differentiated position relative to its competitors (Enz 2011, Porter 1991) because the resources-based theory of such a business suggests that similarity of resources among rival hotels increases competition (Stuke 2013, Barney 1991), and that resource heterogeneity has a competitive advantage (Peteraf 1993).

In their analysis of multidimensional founding location decisions in Manhattan hotel industry, Baum and Haverman (1997) provide evidence to support a combined perspective in which hoteliers established new hotels sufficiently close to established ones that have similar prices to benefit from agglomeration economies, but different on size, to avoid localized competition and create complete differences. In addition to price and size, Urtasun and Gutierrez (2006) investigated the geographic location and services of hotels and found that agglomeration occurs only among differentiated hotels. However, hotel location studies should be preceded by an understanding of urban tourism space

* Department of Hotel Management, Faculty of Tourism and Hotel Management, Yarmouk University(1, 3); and Department of Geography, Faculty of Arts, Yarmouk University(2); and Department of Anthropology, Faculty of Archaeology and Anthropology, Yarmouk University(4), Jordan. Received on 23/8/2016 and Accepted for Publication on 14/1/2017.

and structure because hotels are the basic facilities that support urban tourism (Rogerson 2012).

Luo and Yang (2016) investigated the role of agglomeration economies in determining the hotel location choices (urbanization economies and localization economies), where a sample of Using a sample of 110 star-rated hotels and 535 non-rated budget hotels were analyzed using a mixed logit model of hotel location selection. The results suggest that both star-rated and non-rated budget hotels are enticed by externalities rising from localization economies to choose locations with a high concentration of hotel incumbents. In order to identify the principal factors that determine the location of hotels belonging to a chain, Puciato (2016) used data that cover a period from 2000 to 2009 in three municipalities in the Lower Silesian, Opole and Silesian Voivodeships in Poland. The results of logistic regression indicate that the following factors were crucial for investors; namely, land prices, level of economic development, and the degrees of internationalization and urbanization at the site.

The present location of the established hotels in the city of Irbid belongs to the mono-centric model, which followed the distribution of landuse in a chronological order as rings sprawled from the city center (Yang et al. 2014). The most important ring is the one where Yarmouk University is located, where at least 7 hotels were established and spanned the period from 1975-2011. This is coincided with the major urban sprawl of the city from 1983-2000 (Saleh and Al Rawashdih 2007). The present urban expansion that connects the city of Irbid with the major cities and towns in all directions contributes to the establishment of new hospitality services in these areas (hotels and restaurants). Based on the local economies model of differentiation and the understanding of the urban evolution of the city of Irbid, this study analyzes the current geographic location of the established hotels and models the best place to establish a new hotel that maintains differentiation and competitiveness.

Materials and methods

The study comprises 11 hotels in the city of Irbid that were established during the period from 1975-2011 (figure 1). The exact geographic position was taken in longitude\latitude WGS 1984 coordinates using Garmin GPS. The variables that are used to model the position of the new hotel is the distance to each established hotel from Yarmouk University, the room prices, the room numbers (capacity) and the services as weighted distances from the proposed location of the new hotel. The hotel managers were interviewed regarding the prices, provided services, and number of rooms.

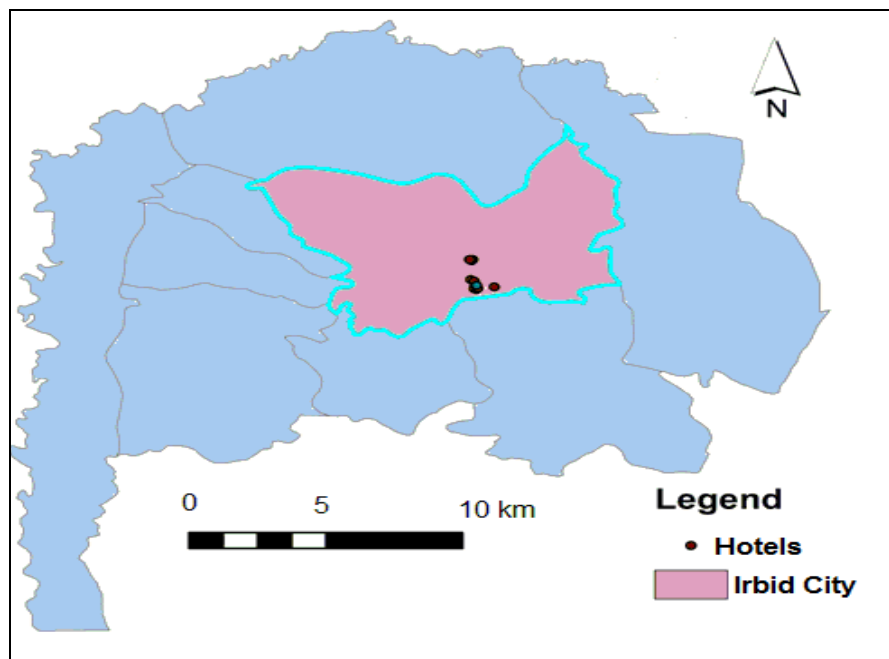


Figure 1: Irbid governorate and the location of the hotels.

A- The mathematical model:

The values of the four weighted distances were calculated according to the formulas in table 1 below after Urtasun and Gutierrez (2006), then were analyzed using multiple regression analysis. This statistical method predicts the value of one of the variables based on the others; the geographic distance is the independent Y variable and the price, capacity and services X_1 , X_2 and X_3 are respectively the dependents. In general, the multiple regression equation of Y on X_1 , X_2 , and X_3 is determined according to formula (1).

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 \dots\dots (1)$$

Table 1: The various formulas for calculating the variables of distance, price, capacity and service offered by established hotels.

Variable	Symbol	Formula
Geographic distance	G_i	$\frac{\sum_{j=1}^{11} \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2}}{11} \dots\dots (2)$ <p>(x_i, y_i) are the location coordinates of the new hotel i and (x_j, y_j) are the coordinates of its competitors. Urtasun and Gutierrez (2006)</p>
Price distance	P_i	$\frac{\sum_{j=1}^{11} P_i - P_j }{11} \dots\dots (3)$ <p>P_i is the price of new hotel i and P_j is the price of one of its competitors. Urtasun and Gutierrez (2006)</p>
Capacity distance	C_i	$\frac{\sum_{j=1}^{11} r_i - r_j }{11} \dots\dots (4)$ <p>r_i is the number of rooms of the new hotel i, and r_j is the number of rooms in its competitors. Urtasun and Gutierrez (2006)</p>
Service distance	S_i	$\frac{\sum_{j=1}^{11} \sqrt{\sum_{m=1}^{M_i} (S_{im} - S_{jm})^2}}{11} \dots\dots (5)$ <p>S_{im} indicates whether the new hotel i offers (value = 1) or does not offer (value = 0) the service m. and S_{jm} refers to its competitors. M_i is the total number of services offered by established hotels. Urtasun and Gutierrez (2006)</p>

B- The GIS model

A suitability model was constructed using ArcGIS 10.2, where the values of each variable were translated into a layer. The geographic distance layer was created using Euclidean distance method, the layers of Price, Capacity and Services were created using the Inverse Distance Weighted interpolation method (IDW). The IDW formula estimates the unknown values (Z) at any location (j) based on equation (6). This formula uses a power of 2, which considers

more the values of the nearest points. To predict a value for any unmeasured location, IDW uses the measured values surrounding the prediction location, where those closest to the prediction location will have more influence on the predicted value than those farther away; each measured point has a local influence that diminishes with distance.

$$Z = \frac{\sum_{i=1}^n \frac{Z_i}{d_i^2}}{\sum_{i=1}^n \frac{1}{d_i^2}}$$

..... (6) *El-Gohari and Al-Shorman (2010)*

The new layers were reclassified into 10 classes, and then each layer is multiplied by a factor of 0.25 to reduce the number of classes in the final layer to 10 or less, and then the layers were arithmetically summed together. The calculated final layer was intersected -using a Boolean method- with the binary buffer layer (the center of the buffer zone is the city center) to exclude positions within the urban rings before 1983 as mapped by Saleh and Al Rawashdih (2007).

Results and discussion

In the Analysis of Variance (ANOVA), the significance F value (0.01) is smaller than 0.05, which means that all of the model coefficients is 0. The coefficient for Price (13.19) is not significantly different from 0 because its P-value is 0.38, which is larger than 0.05. The coefficient for Capacity (-32.69) is not significantly different from 0 because its P-value is 0.06, which is larger than 0.05. The coefficient for Service (-393.59) is not significantly different from 0 because its P-value is 0.06, which is larger than 0.05

The dependent variables of capacity, price and service have a P value > 0.05, which means that these variables does not support agglomeration assumption because there is a possibility that the coefficient of any of these variables is 0. This yields a result of 0 in equation no (1) above.

Table 2: Results of multiple regression analysis.

Regression Statistics					
Multiple R		0.88401			
R ²		0.78148			
Adjusted R ²		0.68783			
Standard Error		554.188			
Observations		11			
ANOVA					
	df	SS	MS	F	Significance F
Regression	3	7688402.9	2562800.96	8.34	0.01
Residual	7	2149867.27	307123.89		
Total	10	9838270.18			
	Coefficients	SE	t Stat	P-value	
Intercept	2847.02	453.19	6.28	0.0004	
Price	13.19	14.12	0.93	0.38	
Capacity	-32.69	14.26	-2.29	0.06	
Service	-393.59	175.41	-2.24	0.06	

As the mathematical model fails to predict the location of new hotels based on agglomeration, the GIS suitability model is then constructed based on differentiation. The execution of the spatial model resulted in suitable areas for establishing a new hotel that are far from the other hotels but at the same time in close proximity to Yarmouk University of about less than 10 km. These suitable areas are marked as classes 6 in the northwestern part of the city, (figure 2), and class 5 in the southern part of the city. However, these 2 classes make from them the places of choice for establishing a new hotel in the city that ensures differentiation and competition among other established hotels.

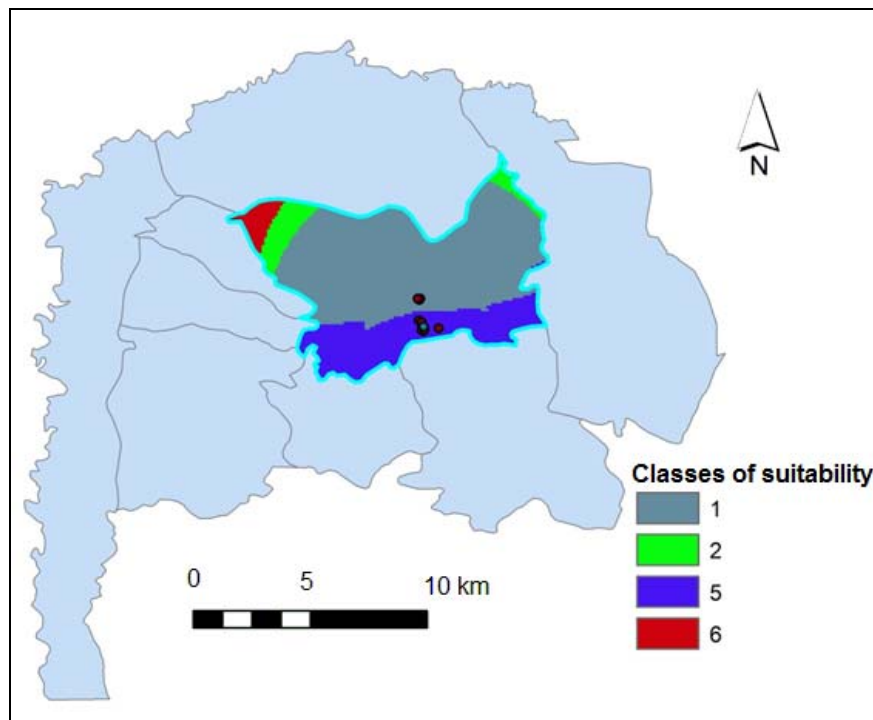


Figure 2: The suitability model of new hotel location in the governorate of Irbid.

The hotels in the city of Irbid are clustered as a result of location based economies, where Yarmouk University and the generated businesses in the proximity have played an important role; their presence in the same location required the same location-specific factor and at the same time shared similar suppliers and markets. These findings are in conformity with the results of the studies by (Erlinger 1977; McCann 1995 and Henderson et al. 2001). Although the new proposed location may benefit from agglomeration or geography of resource demand, it is eventually favored by differentiation as supported by both the mathematical and GIS models. According to the dynamic theory of strategy by Porter (1991), more success can be achieved when the new hotel has an attractive differentiated position relative to the other clustered ones. However, the competitive advantages of the new hotel should be derived from differentiation from its rivals -either by lowering the cost of services than rivals or by providing unique services at a premium price. According to the localized competition hypothesis by Baum and Mezias (1992), the more similar a focal organization is to its competitors, the greater the intensity of competition it will experience.

Conclusions

The new location of potential hotels in the city of Irbid should benefit from the geography of the demand resource. Geographic Information System is a useful tool in planning for hotel locations, where it models the mode of urbanization as well as the uniqueness in the provision of services. However, hoteliers' decisions are critical due to the high cost of such an investment, product reconfiguration and the overall political turmoil and instability of the region. The proposed new locations in the study should be dealt with as dynamic ones because the factors that will contribute to the determination of future locations are intertwined and changeable. Further future researches in this area are actually needed not only on the northern region but also in rest of Jordan. The results of such studies need to be shared with entrepreneurs and stakeholders in the hospitality industry.

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المواقع الجديدة للفنادق في مدينة إربد باستخدام نماذج نظم المعلومات الجغرافية

احمد عبد المنعم المخادمة، ريم عدنان الخاروف، فرات معن المحيسن، عبدالله احمد الشerman*

ملخص

تحدد هذه الدراسة الموقع المناسب لبناء فندق جديد في مدينة إربد بالاعتماد على الموقع الجغرافي، والسعر، والسعة، والخدمات المقدمة في الفنادق المنشأة أصلاً. بالاعتماد على بيانات من 11 فندقاً في المدينة، إذ تم عمل نموذج رياضي وآخر جغرافي؛ لفحص التكتل والتمايز الاقتصادي للموقع الجديد. اقترحت النتائج أن الموقع الجديد يمكن أن يستفيد من التجمع الاقتصادي ولكن بصورة أكبر من التمايز الاقتصادي. وعلى الرغم من ذلك فإن الخدمات والأسعار التي ستقدم يجب أن تكون منافسة.

لكلمات الدالة: موقع الفندق، إربد، الأردن، الاقتصاديات المحلية، نظم المعلومات الجغرافية.

* قسم إدارة الفنادق، كلية السياحة وإدارة الفنادق، جامعة اليرموك (1، 3)؛ وقسم الجغرافيا، كلية الآداب، جامعة اليرموك (2)؛ وقسم الأنثروبولوجيا، كلية الآثار والأنثروبولوجيا، جامعة اليرموك (4)، الأردن. تاريخ استلام البحث 2016/8/23، وتاريخ قبوله 2017/1/14.