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Spatial Analysis of Effective Factors on Distribution of Economic Activities in 14 Zones of Esfahan Municipality

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Abstract

In recent years, the studies of location play a key role in success and stability of economic activities. Location studies are under consideration in both national and international levels. Meanwhile, identification of goals and methods of solving location problems have significant importance. The purpose of this paper is to examine spatial distribution of economic activities in 14 zones of Esfahan. In parallel to this approach, existing activities in Esfahan have been classified homogeneously into 32 activity groups. Then, the zones with diversification and specialization have been studied, as well as effective factors on location of these activities by using of a regression model. Considering locational data in this survey, the specified model, have been estimated by spatial econometric methods to consider spatial effects in model as far as possible. Based on research results, both specialization and diversification factors are effective factor on location of economic activities in Esfahan. The results show that contiguity factor is effective on distribution of activities; therefore spatial relationship exists among the various zones of Esfahan.

Keywords*: Localized Agglomeration Economies, Hotelling Model, Spatial Econometric, Urbanized Agglomeration Economies.*

JEL classification: R12

1. Introduction

Urban economics is the study of locating firms and households and analyzes the concept of locating economic activities. In urban economics it is the household who decides where to work and where to live (O'Sullivan, 2003).

How do firms decide about a specific location to establish their business and do their activities? The answer to this question is considerably important for both investors who invest in economic activities and decision-makers in

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an area because investors try to find a location to maximize their profit and decision- makers, on the other hand, try to attract those activities that are the most effective in economic growth and development of an area (Sabagh Kermani, 2001: 30).

Firms' decisions for their location are based on profit maximization. There are some reasons why potential profit of a firm is different from location to location; first, since the transfer of inputs and products is money-consuming, locations with rather low transfer costs are more profitable. Second, some inputs cannot be completely transferred and locations with cheap local inputs can make more profit. Third, some firms benefit from being contiguous with other firms in the same industry (Localization economies). Fourth, locations with a rather efficient public sector cause higher profits (if all the other conditions are identical) (O'Sullivan, 2003).

According to study of Farahmand, Khoshakhlagh and Pahlevanzadeh (2013), variables of specialization and diversity are very effective in locating firms and the number of banks has positive effect on firm location.

Sridhar and Wan (2007) have studied determinants of the locational choice of firms among cities in China, India and Brazil. They have concluded that proximity to inputs has a positive impact on firm location. Large firms in India prefer to locate in the largest cities and the size of firm does not have any impact on firm location in china.

Dominics, Arbia and de Groot (2007) by using spatial data analysis in both the manufacturing industry as well as in services for Italy have shown the existence of well-defined clusters of economic activities.

Holems and Stevens (2003) have found that for industries which produce non tradable goods or services, such as retail, less specialization exists, while for tradable goods like manufactures, mining output, and agricultural products, there is much more specialization across regions.

Combes and Overman (2003) have considered the spatial distribution of economic activities in the European Union. The results of their study have shown that UK and France have the least level of specialization. Ireland and Greece have the highest specialization levels.

Considering importance of above statements, the purposes of this research are study of spatial distribution of different economic activities in Esfahan, recognition of areas with specialized and diversified activities and also determination of effective factors on location of present activities in 14 zones of Esfahan.

The paper is structured as follows. Section 2 presents theoretical bases of research. Section 3 surveys Status of zones in Esfahan. Section 4 analyzes

related indexes. Section 5 discusses empirical model and results of estimated model. Section 6 concludes.

2. Theoretical Bases of Research

2.1. Economies of Scale

The concept of economies of scale implies the conditions which cause long-time average costs of firms to decrease through increasing production. "Marshall" (1920) first introduced this concept. He categorized benefits from increasing production into two categories: External benefits which are dependent on general development of industry, and internal benefits which are dependent on the organization of commercial institutions and the efficiency of their management.

To study these conditions it is necessary to differential between internal economies of scale and external economies of scale:

a) Internal economies of scale encourage production to change to mass production in factories rather than being concentrated in individuals' hands;

b) External economies of scale cause economical units to aggregate along geographical space of an economy (Sabagh Kermani, 2001).

To make more accurate investigation of the main sources of agglomeration economies possible, urban economics literature considers two main categories for external agglomeration economies: Urbanized agglomeration economies and localized agglomeration economies. The main difference between these two categories is in the overall shape of their agglomeration.

A mysterious characteristic of urban economics is that firms tend to locate next to other firms which produce identical products (O'Sullivan, 2003).

Localized agglomeration economies means concentration of a special industry in a specific location, one of the clearest examples of which is clustering activities of an industry in an area. A cluster contains of small and average size firms which are concentrated in terms of time and location and are specialized in terms of districts (Robellotti, 1997).

Agglomeration of firms with identical products emphasize the concept of specialization in economics which is the most important factor contributing to the development of a region. This theory is known as Mar (Marshall-Arrow-Romer) externalities.

Urbanized agglomeration economies imply the importance of the role of "diversity" of economic activities in urban growth. According to Jacobs (1969), when different economic units are located within short distances, they can exchange knowledge in different fields, which leads to preparing

the ground for creativity, innovation and completion of production technologies. This is known as "Jacob's externalities". According to Jacob's theory, diversity of urban occupations results in the efficiency of aggregate production and the growth of job opportunities.

In addition to diversity, city size is also a sub-category of urban agglomeration. The more the diversity in urban activities, the more the population density. As city size increases, the number of potential customer increases and markets enlarge. Consequently, financial services, transportation and communication develop. Therefore, bigger cities have more job opportunities (Illy, Hornych, Schwarts & Rosenfeld, 2009).

Urbanization economies of scale are different from localized one because of two reasons: First, urbanization economies of scale are derived from total index of urban economics not merely from a specific industry. Second, urbanization economies of scale have benefits for all the firms in a city not just for the companies that are located in a specific industry (O'Sullivan, 2003).

2.2. Location Theories of Economic Activities

The issue of locating industrial projects and industrial production areas is one of the key factors in investment.

Location is analyzing the potentials of an area in terms of the existence of sufficient and appropriate land, its connection to other usages and urban facilities in order to select an appropriate location for a specific use (Farhadi, 1999:55).

Models for location were first proposed by Fentonen in 1826 for agricultural activities. Then Launhardt in 1882 and 1885 suggested models for industrial location. But it was Alfred Weber from Germany who formed the regular and scientific foundation of industrial location model in 1909. Later, Christaller and Losch played important roles in developing and expanding it to fit central location models. Then, Hoover and Isard in the U.S.A. and Peroux in France developed it further more and finally in 1929 the Hotelling model was introduced.

In the present study, mostly the Hotelling model has been used as well as the model of agglomeration economies of scale in marketing.

The Hotelling model can indicate the role of location in determining market share of firms. In explanation of Hotelling model, it is said that firms can locate either completely alongside each other or in a way that the market can be equally shared by them. Here, firms are not worried that other firms may take their place. Plus, it caused a reduction in prices for customers in

places near where sellers have settled, which is known as the Hotelling social equilibrium (Sabagh Kermani, 2001: 37).

In marketing agglomeration economies happens when the sale of a shop is affected by the location of other shops. Clustering of identical companies reduces the expenses of purchase and attracts customers. The benefits of this lead to the formation of commercial centers with diversification of goods (O'Sullivan, 2003).

3. The Status of Zones in Esfahan

Urban zoning is dividing a city into special areas with clear boundaries for responsibilities of each area (Shakouee, 1995: 241). Urban zoning is used to maintain and improve the levels of sanitary, safety and welfare (Widner, 2003: 1).

Esfahan has two cultural and natural pivots. The Zayanderood river is considered the natural pivot and Charbagh street is the cultural one (Shafaghi, 2003: 417). The city area is divided into 14 urban zones.

In Esfahan, Agglomeration economies of scale for purchase forms different kinds of retail groups. For some groups, retailers make a retail path along arterial streets, while other retailers are clustered in shopping centers, markets and city centers.

Economic activities in Esfahan are concentrated in central areas and zones 1 and 3. Similarly, zones 5 and 6 benefit from the concentration of various economic activities (Farahmand, Khoshakhlagh & Pahlevanzadeh, 2013: 140)

Esfahan has various activities but to curb the area under analysis of the present study, the existing activities are clustered into 32 categories based on their similarities. These activities are included: agricultural activities, food industries, clothing, shoemaking, carpet, textile, stationery, cosmetics and sanitary accessories, plastic accessories, building services, building material, real estate agent, photography, stonecutting, telecommunications, transportation services, hotel industries, food-selling business, household apparatus, fruit wholesale, automobile accessories, vehicle services, furniture and wooden artifacts, automobile selling, biomedical equipment, watchmaking, electrical services, optician, jewelry, metallic artifacts, chinaware and common household services.

4. The Related Indexes

4.1. Specialization Index

The index of Localized Agglomeration Economies of Scale in this study is "Location Quotient" (LQ). This index denoted by $LQ_{r,i}$:

$$LQ_{r,i} = \frac{L_{r,i} / \sum_i L_{r,i}}{\sum_r L_{r,i} / \sum_i \sum_r L_{r,i}} \quad (1)$$

The numerator of this index measures the share of number of activities in industry r in zone i with respect to the total number of activities in industry r in total zones And the denominator is the share of total activities in zone i with respect to the total activities in the city.

In the present study, regarding the purposes, this index is calculated based on the number of existing firms in each activity in different zones of the city.

4.2. Diversification Index

Hirschman- Herfindahl index is used for calculating diversification (Urbanized Agglomeration Economies of Scale):

$$HH_i = \sum_{r=1}^{I} (L_{r,i} / L_i)^2 \quad (2)$$

In Equation (2) $L_{r\,i}$ is share of number of activities in industry r with respect to total activities in zone i; L_i is the total activities in the zone and I is the total activities. The inversion of index is used for calculate diversification among zones or industries. There for, the decrease in this diversity indicates that distribution of activities is moving towards balance.

4.3. Analysis of the Distribution of Economic Activities in Esfahan Based on the Presented Indexes

One of the indexes used to analyze the distribution of activities is specialization index. This index indicates localized agglomeration economies of scale and therefore specialization level of zones.

The results obtained by this index for 14 existing zones in Esfahan and 32 clustered activities are presented in Table 1.

According to table 1, this index has been calculated for 32 existing activities in Esfahan and for each activity two regions with the highest specialization index (LQ) are determined. For instance, agricultural activities have the highest levels of specialization in zones 6 and 9 and therefore locating agricultural activities in these 2 zones can optimize localized agglomeration economies of scale. Thanks to being near the river Zayanderood, as well as being business center zones 1 and 3 are involved in some specialized activities compared to other zones.

Table 2 shows the hierarchical order of zones in Esfahan based on specialization of economic activities.

According to Table 2, the highest specialization among the zones of the city is for zones 3 and 4.

In zone 4, fruit wholesale activities have the highest specialization and according to the statistics this kind of activity is concentrated in this area. Moreover, this zone has specialization for telecommunication activities (Table 1).

Zone 3 is an area in Esfahan which has the highest specialization and diversification for economic activities.

Table 1. More Specialized Zones of Esfahan in Terms of Type of Activity

Row	Activities	First Region with Maximum LQ	LQ quantity	Second Region with Maximum LQ	LQ quantity
1	Agricultural activities	zone 9	1.298	zone 6	1.057
2	food industries	zone 14	1.5	zone 7	1.456
3	clothing	zone 3	1.717	zone 6	1.584
4	shoemaking	zone 3	1.257	zone 1	1.622
5	carpet	zone 3	2.724	zone 6	0.899
6	textile	zone 3	3.379	zone 1	0.849
7	stationery	zone 6	1.745	zone 3	1.464
8	cosmetics and sanitary accessories	zone 6	2.269	zone 5	2.028
9	plastic accessories	zone 4	1.628	zone 14	1.309
10	building services	zone 4	1.712	zone 13	1.641
11	building material	zone 2	1.864	zone 8	1.403
12	chinaware	zone 3	2.27	zone 6	1.21
13	jewelry (gold and silver)	zone 3	3.66	zone 5	0.813
14	metallic artifacts	zone 11	2.654	zone 2	1.665
15	electrical services	zone 1	1.431	zone 4	1.318
16	opticians	zone 1	2.836	zone 7	1.533
17	watchmaking	zone 1	2.269	zone 3	1.335
18	biomedical equipment	zone 1	2.7	zone 6	1.747
19	automobile selling	zone 14	2.571	zone 12	2.386
20	furniture and wooden artifacts	zone 11	4.515	zone 9	2.229
21	vehicle services	zone 12	3.352	zone 2	2.155
22	automobile accessories	zone 1	2.062	zone 2	1.365
23	fruit wholesale	zone 4	17.705	zone 9	4.839
24	household apparatus	zone 1	1.603	zone 6	1.454
25	food-selling business	zone 6	1.641	zone 5	1.584
26	hotel industries	zone 1	4.368	zone 6	2.487
27	transportation services	zone 3	1.993	zone 11	1.661
28	telecommunications	zone 4	1.986	zone 3	1.81
29	real estate agent	zone 7	2.081	zone 5	2.058
30	photography	zone 6	2.149	zone 5	1.834
31	stonecutting	zone 2	4.846	zone 14	2.932
32	activities related to common household services	zone 6	2.289	zone 4	1.627

Source: Findings of research

Table 2. Hierarchical Order of Zones in Esfahan Based on Specialization of Economic Activities

Row	Zones	Specialization Index
1	zone 4	50.297
2	zone 3	38.148
3	zone 1	37.503
4	zone 6	36.593
5	zone 5	34.474
6	zone 7	26.799
7	zone 13	26.764
8	zone 8	25.859
9	zone 9	25.779
10	zone 14	25.637
11	zone 2	24.944
12	zone 10	24.880
13	zone 12	24.552
14	zone 11	22.690

Source: Findings of research

Table 3 presents hierarchical order of zones in Esfahan based on the diversity of economic activities.

Table 3. Hierarchical Order of Zones in Esfahan Based on the Diversity of Economic Activities

Row	Zones	Diversity Index
1	zone 1	39.64
2	zone 3	37.50
3	zone 5	34.95
4	zone 6	34.58
5	zone 4	32.28
6	zone 10	31.98
7	zone 8	31.58
8	zone 13	31.21
9	zone 7	30.55
10	zone 14	28.82
11	zone 11	28.52
12	zone 9	27.61
13	zone 2	24.82
14	zone 12	15.80

According to Table 3 zones 1 and 3 have the most diversity in economic activities in Esfahan compared to other zones. The reason behind this high diversity of economic activities is the existence of Enghelab square, Shohada square, Charbagh Street and so on.

The second top zone in Esfahan, regarding the diversity of economic activities, is zone 3. In the next position come zones 5 and 6. District 12 is at the bottom of the list and has the least diversity of economic activities. This

can be due to industrial structure of the area (Farahmand, Khoshakhlagh & Pahlevanzadeh, 2013).

5. Empirical Model

5.1. Spatial Model

The general format of the model used in the present study has been used by Sridhar and Wan (2007) in their article. In the present research, similar to the article mentioned above, factors influencing locating firms are themselves by geographical and economic factors. Therefore, the model used in the present study is a polynominal equation as it is seen below:

$$L_{ij} = f(A_{ij}, G_j) \quad (3)$$

where i represents the type of activity. j represents number of the zones of Esfahan municipality. Lij stands for number of active firms in the field of activity i in zone j. Aij denotes factors related to type of activity.

According to location theories that have been mentioned above, diversification and specialization are two factors that effect on choice of firm location in the city. They are Urbanized Agglomeration Economies and Localized Agglomeration Economies and are mentioned as A_{ij}. They have been denoted by Location Quotient index and Hirschman- Herfindahl index. G_j refers to regional factors including population of each zone, the number of banks, price of land zoning and existing green space in each zone (Farahmand, Khoshakhlagh & Pahlevanzadeh, 2013).

As activities in cities are generally commercial, accessibility to different financial services is among the factors affecting locating these activities in cities. Accessibility to bank is considered as a criterion in the present study.

According to above factors, the regression model can be specified as follows:

$$L_{ij} = \beta_1.POP_j + \beta_2.PARK_j + \beta_3.LQ_{ij} + \beta_4.LQ_{ij}^2 + \beta_5.HHI_{ij} + \beta_6.BANK_j + \beta_7.PRICE_j \times LQ + \beta_8 SL_{ij} + \varepsilon_{ij} \quad (4)$$

In this study α and β are parameters. Also variables of the model include:

L_{ij}: number of present activities in zones of Esfahan. This is dependent variable of the model.

POP_j: population of Esfahan zones in year 2009.

$PARK_j$: present green space of each zone in terms of square meter.

LQ_{ij}: Location Quotient index that shows specialization in each zone.

LQ^2_{ij}: Location Quotient index square.

HHI_{ij}: Hirschman- Herfindahl index that shows diversification in each zone

$Bank_j$: public and private banks in zones of Esfahan.

$PRICE_j$: price of land zoning that is based on commercial value of real estates.

$PRICE_j * LQ_{ij}$: cross effect of land price and specialization factor.

SL_{ij}: Contiguity factor

Since the data are spatial, contiguity factor can also affect locating activities in different zones of Esfahan. To this end, first through Moran's *I* statistic, the existence of spatial autocorrelation is tested. The obtained value for Moran's *I* statistic is -0.32 and obtained probability for this statistic is 0.2 which proves the existence of spatial autocorrelation and shows that contiguity factor can be entered into the model as a factor which can affect locating activities.

Considering the fact that Moran's *I* statistic is significant, the model is investigated spatially. The variable SL_{ij} is obtained through multiplying values matrix of dependent variable by standardized spatial weight matrix. SL_{ij} is entered into the model as an independent variable. The coefficient of this variable indicates the effect of contiguous zone on the investigating variable. If the model in this study has spatial autocorrelation, this coefficient is significant and has a positive value.

The number of observations is 448 which consist of 32 activities in 14 zones of Esfahan.

5.2. Model Estimating

First, the model is estimated by OLS method. White's test is applied for recognizing Hetero Skedasticity, the results of which are in Table 4.

Considering F statistic, it can be seen that this statistic is located in the region of rejection of the null hypothesis. Hence the results of the test prove the existence of Hetero Skedasticity in the investigated model.

Due to the existence of Hetero Skedasticity, the model is estimated through GMM to make it possible to define instrumental variables for the model and get rid of Hetero Skedasticity. The results of the estimation of the spatial model are in Table 5.

Based on the results of the estimation of the model and R^2, it is proved that the model is significant. The population factor can affect the activities in Esfahan, as by increasing regional population Locating commercial firms in that zone increase too.

Table 4. White's Test

Statistic		
F	7.200	probability 0.000
R^2	99.266	probability 0.000

Source: Findings of research

Table 5. Results Obtained through the Estimating of Spatial Model with Existence of Contiguity Factor

Variable	Estimated Coefficient	Standard Deviation	T Statistic	Probability
pop	0.151	0.03	-7.691	0.000
LQ	1.798	0.235	7.642	0.000
LQ^2	-0.068	0.009	-7.69	0.000
HHI	0.194	0.081	2.379	0.018
PARK	-0.002	0.03	-0.068	0.945
BANK	0.011	0.002	4.519	0.000
PRICE*LQ	-0.004	0.002	-2.406	0.000
SLL_{IJ}	0.131	0.077	1.702	0.089
R^2	0.39	Dependent Variable Mean		4.068
Adjusted R^2	0.381	Standard Deviation of Dependent Variable		1.635
Standard Deviation of Regression	1.355	j Statistic		0.003

Source: Findings of research

According to the results of the present model, two factors, specialization and diversity, known as localized and urbanized economies of scale are factors which affect locating economies activities in Esfahan positively.

LQ^2 has a negative and significant effect on locating activities in the zones of Esfahan. The reason behind this can be over-concentration of an activity, increasing the demand for land and consequently results in the increase in the price of lands in a zone.

As for diversity, the more diverse, the economic activities in a zone, the more interested the new firms to locate there to benefit from urban economies of scale. In addition to specialization variable, diversity variable too has high coefficient. Therefore it can be concluded that the coefficients of the variables related to the firm (A_{ij}) have more effectiveness compared to regional factors (G_j). Moreover, green space in every zone is statically insignificant in the model. Therefore green space in each zone does not affect locating economic activities in Esfahan. The number of banks in a zone has a positive and significant effect in locating activities.

The cross-over effect of land price and specialization has a negative effect on locating activities in Esfahan. In other words the effect of specialization on locating urban firms, in addition to being non- linear, is itself affected by land price. Actually, new firms, due to having little capital choose market margins and don't locate in a place where there is high specialization of an activity because of high price of land.

When an activity is specialized in a zone, the number of firms related to that activity finds an ascending trend in that zone. This trend continues until the price of land increases to a point which cause the decrease of this trend.

Therefore, by saturation of the capacity of that zone, a new nucleus forms next to the previous one.

It can be seen that spatial lag of dependent variable is significant. In spatial econometric literature, when there is autocorrelation in dependent variable and spatial lag of dependent variable is entered into the model along with other explanatory variables and has a significant coefficient, the model is called mixed regressive- spatial autoregressive model (SAR).

According to Table 5, the coefficient of spatial lag variable is positive and significant; hence there is positive autocorrelation. It can be concluded that contiguity factor has an important role in locating activities. In other words, when the number of firms in contiguous zone increases, the number of firms in that specific zone increases too.

5.3. The Estimation of the Model for 10 Activities with the Maximum Diversity and Specialization

To study the effectiveness of the factors under analysis on locating firms based on the kind of their activity, the spatial model under study is re-estimated for 10 activities in Esfahan which have the maximum diversity and specialization. 10 activities with the highest specialization include: fruit wholesale, stonecutting, furniture and wooden artifacts, hotel industries, automobile accessories, jewelry, clothing, vehicle services, opticians and carpet. These activities have the highest specialization among existing activities in 14 zones of the city.

Also, 10 activities with the most level of diversification include: agricultural activities, food industries, building material, clothing, food selling business, building services, furniture and wooden artifacts, common household services, automobile selling and plastic accessories.

The results in Table 6 indicate that Explanatory power of the model for the most specialized activities and the most diverse ones is 66 and 61 percent respectively. The population factor is important in distribution of specialized activities but in distribution of diverse activities it is not effective.

Considering the information offered earlier, specialization is a very effective factor and it can affect the distribution of activities in the spatial model offered. This is also effective for the most specialized and the most diverse activities in these two models. In both models, specialization in higher level has a negative effect on distribution of activities. The effectiveness of diversity is also analyzed for the most specialized and diverse activities. This factor has an effect on locating activities in both models. For 10 activities with high diversity, the effectiveness of square of diversity index is also entered into the model. The results indicate that when in higher levels, the variable of diversity has negative effect on locating

these activities. In fact in higher levels the effectiveness of this factor on distribution of these activities is reverse.

The results show that green space in each zone doesn't have an effective role in locating firms in Esfahan, either for specialized activities or diverse ones. Firms which start working in these activities don't consider this regional factor. The number of banks in a zone is important and this variable is significant in both models. In the first spatial model for the 10 activities with high specialization, the variable which shows the cross-over effect of land price on specialization is not statistically significant; this means this index is not effective in locating these activities. This variable is 90 percent significant in the second model for the most diverse activities.

The results obtained by analyzing these two models show contiguity factor is significant for the most specialized and diverse activities; which means there is autocorrelation. Therefore, it can be stated that contiguity factor is important in locating these activities.

Table 6. The Results of the Model for Activities with the Maximum Diversity and Specialization in Esfahan

Variable	Model 1: Activities with the Maximum Specialization	Model 2: Activities with the Maximum Diversity
POP	3.41E -0.06 (0.087)*	2.26E -0.06 (1.141)
LQ	1.115 (0.000)***	2.181 (0.001)***
LQ^2	-0.040 (0.000)***	-0.310 (0.022)**
HHI	1.817 (0.003)***	2.917 (0.000)***
HHI^2	- -	-0.563 (0.000)***
PARK	0.022 (0.619)	-0.046 (0.304)
BANK	0.010 (0.008)***	0.013 (0.002)***
PRICE*LQ	-0.002 (0.386)	-0.004 (0.078)*
SLL_{IJ}	0.278 (0.045)**	0.148 (0.014)**
R^2	0.664	0.619
Adjusted R^2	0.646	0.596
Standard Deviation Regression	1.188	0.884
Mean of Dependent Variable	3.400	4.753
Standard Deviation of Dependent Variable	1.999	1.392
Number of Observation	140	140

*,** ,*** significant at level 10%, 5% and 1% respectively

Source: Findings of research

6. Conclusions

In this study, factors having an effect on spatial distribution of economic activities have been investigated. For this purpose, first, diversification and specialization in zones have been analyzed by the use of related indexes. Then using regression model, the impact of effective factors on distribution of activities has been estimated.

The noticeable point of this study is that data have locational dimension. So, the specified model has been estimated by spatial econometric methods to consider spatial effects in model.

According to the results the variables of specialization and diversity are very effective in locating firms because of taking benefit from localized and urban economies of scale. Also zones 1 and 3 have the most diversity in economic activities in Esfahan and zones 4 and 3 have the most specialization in economic activities.

This article also indicates that the number of banks in each zone has positive effect and the cross effect of land price zoning and specialization and also green space have negative effect on locating activities in Esfahan.

Following the test of spatial autocorrelation, the variable of spatial lag of dependent variable has been entered into model as another factor. The results have revealed contiguity factor has an effect on locating activities and spatial lag of dependent variable is significant.

Considering the results of this study, it is suggested that economic firms locate in zones where there is agglomeration of identical activities. These firms should consider contiguity factor as well. Also each activity, when locating, can choose an appropriate zone based on the kind of activity to benefit from localized economies of scale.

References

1. Anselin, L. (1988). *Spatial Econometrics: Methods and Models.* Dorddricht: kluwer Academic Pablishers.
2. Combes, P.P. & Overman, H.G. (2003). The spatial distribution of economics activities in European Union. Available at: http:// www.econ.brown.edu.
3. *Commercial value of real Estates booklet*, Office of Economy and finance (2010).
4. Dominicis, L., Arbia, g. & de Groot, H.L.F. (2007). The spatial distribution of economics activities in Italy. *Tinbergen Institute Discussion Paper*, 94(3), Duranton, G and D.
5. Esfahan municipality statistic report (2009).

6. Farahmand, Sh., khoshakhlagh, R. & Pahlevanzadeh, B. (2013). Analysis of effective factors on distribution of economic activities in Esfahan. *The economic research.* 13 (1), 133-153.
7. Farhadi, R. (1999). Analysis of school location in Tehran zone 6 by using of GIS.
8. Holemes, T. J. & Stevens, J.J. (2003). The spatial distribution of economic activities in North America. *NBER Working Papers*. Available at: http://www.nber.org.
9. Illy, A., Hornych, c., Schwarts, M., & T.W. Rosenfeld, M. (2009). Urban growth in Germany –The impact of localization and urbanization economies. Halle Institute for Economics Research-*HWH, 19.*
10. .Jacobs, J. (1969). The economy of cities, Random House, New York.
11. Marshall, A. (1920). Principles of economics, 8th ed., London: Macmillan, 1st, ed,1890.
12. O' Sullivan, A. (2003). *Urban Economics*. 5th ed.
13. Robellotti, R. (1997). *External economic and cooperation in industrial districts: A comparison of Italy and Mexico.*
14. Sabagh kermani, M. (2001). *Regional Economic* (First edition). Tehran: samt press.
15. Shafaghi, S. (2003). *Geograghy of Esfahan*. Fist ed., Esfahan university press.
16. Shakouee, H. (1995). *New points in urban geograghy*. Volume 1, samt press.
17. Sridhar, K.S. & Wan, G. (2007). Firm location in cities evidence from China, India, and Brazil**.** *World Institute for Development Research***,** 57.
18. Statistics of Islamic republic of Iran banks. Available at www.banki.ir/internet-bank
19. Widner, R. (2003). Planning Law Primer. *Basics of Variances Planning Commission Journal*, 50.