



## **Influencing Variables on Urban Spatial Structure in Metropolitan Regions; a Study in the Contemporary Theoretical Approaches and Practices**

**Musa Pazhuhani<sup>1\*</sup>, Ahmad Pourahmad<sup>2</sup>, Ahmad Saeednia<sup>3</sup>, Karamatoola Ziari<sup>4</sup> and Mehdi Gharakhlou<sup>5</sup>**

<sup>1</sup>Ph.D Candidate in Geography and Urban Planning, Faculty of Geography, Tehran University, Tehran, Iran.

<sup>2</sup>Professor of Geography, Faculty of Geography, Tehran University, Tehran, Iran.

<sup>3</sup>Retired Professor of Geography, Faculty of Geography, Tehran University, Tehran, Iran.

<sup>4</sup>Professor of Geography, Faculty of Geography, Tehran University, Tehran, Iran.

<sup>5</sup>Retired Professor of Geography, Faculty of Geography, Tehran University, Tehran, Iran.

---

Received 10 November 2012;

Revised 30 January 2013;

Accepted 14 May 2013

---

**ABSTRACT:** Metropolitan regions as a result of the steady stream of urbanization in industrial period which have occurred during 20th century, become the engine of countries growth and development. In the process of formation and development in these areas, spatial structuring that define through two elements of population and activity with the communication structure interacting between them, has been effective on the overall performance and the characteristics of spatial structure in metropolitan regions. The main goal of this research is to study the most important factors influencing the trends in the spatial structure of metropolitan regions. Through studying the various theories and also the contemplation of metropolitan region samples in developed and developing countries, it is hoped that a better and deeper understanding of total trends of spatial changing will be reached. Besides the main reasons influencing these trends can be identified. The research method is comparative-analytical, and the study is done by the help of recent literature analysis and review on the spatial structure of metropolitan regions. Results show that in a general, metropolitan regions in developing countries have similar trends in their structure, but with time delay more than developed western examples. Moreover the four major factors: communication infrastructure, economic globalization, decentralization and more effective communication between agencies and companies have had the most influence on the spatial processes and changes.

**Keywords:** Metropolitan Regions, Spatial Structure, Metropolitan Growth Patterns, Spatial Changes.

---

### **INTRODUCTION**

The emergence of the metropolitan regions is one of the most important phenomena in the twentieth century which is the continuing result of dominant trend of urbanization in the beginning of the eighteenth century.

This remarkable phenomenon that firstly because of the concentration of investment, activity and the population was formed in the most important cities in the world resulted, the decentralization of population and

activity in the wider area with respect to social, political, economic and industrial processes. Today these urban centers are considered to be the most important centers of national development and concentrate significant proportion of capital and population.

Among all the issues raised in different dimensions which complicate the phenomenon, there has been an increasing favorite in the studying and analysis of the spatial structure of metropolitan regions, is the field of urban economics.

After 1980,s and in the context of slow changes on the one hand and gradual evolution on the other hand, transformation and substantive changes in the metropolises the dominant issue which experts and

---

\* Corresponding author email: Mpanahandehkhah@ut.ac.ir



scientists are engaged in urban and regional planning is the phenomenon of urban restructuring or reform, so that being metropolitan process in most countries is associated by finding structure of metropolitan re-organization of the metropolitan areas of economic, social and physical - space.

Spatial structure issue in its simple definition is explaining the spatial distribution of populations and activities with a communication network between them, extensive and significant studies on sustainable development in environmental, economic, social has been attracted over the last few years, so that nowadays it is one of the major platform of research and development of in many academic, research and administrative centers in the world.

The literature over the last few years has reinforced the idea that the urban spatial structure, that is, the way in which a metropolitan city is organized in a territory, generates important economic, environmental, and social effects. From the environmental perspective, studies by Khan (2000), Nijkamp and Finco (2001), Muñiz and Galindo (2005), and Bertaud (2002) and Camagni et al. (2002) emphasize the close relationship that has been established between spatial structure and environmental sustainability, whether in terms of land consumed or in energy efficiency and CO<sub>2</sub> emissions. Evans (1976), Rogers (2000), Bertaud (2002), and Camagni et al. (2002) point out the importance of spatial structure in issues relating to social justice and territorial segregation. From the economic point of view, studies such as those by Ciccone and Hall (1996) and Harris and Ioannides (2000) highlight the influence of spatial structure on productivity; Camagni and Salone (1993) associate it with economic competitiveness, and Lee and Gordon (2009) link it with economic growth (Angel & Lopez, 2010, p.120).

Anas et al. (1998) suggest that urban growth patterns in developed countries have undergone a “qualitative change” over the last two decades, characterized by the emergence of increasingly large and diversified suburban employment sub-centers that are in direct competition with the traditional city center, with the continual decentralization of both population and employment, which have profoundly changed the spatial structure of contemporary metropolitan areas and led to a more dispersed and polycentric urban form (Coffey & Shearmur, 2001)

Although the nature, causes and consequences of this spatial change have still been under debate (Lee, 2007; Shearmur et al., 2007), the polycentric urban phenomenon has been extensively documented and

empirical regularities are evident in the literature (Anas et al., 1998; McMillen & Smith, 2003; Baumont et al., 2004; McMillen, 2004). Policy concerns have also arisen regarding the changing urban structure, given the social, environmental and economic impact involved (Lang & Lefurgy, 2003).

Based on the importance of spatial issues on metropolitan sustainability domain and quality of life in these vast residence and activity zones, the main goal of the paper is to study and identify the spatial process in metropolitan regions structure and their influencing factors.

In this research in addition to studying different theories about economic generalization which has had main and principle effects on metropolitan areas structure especially in developed countries, forces and documented factors by different researchers in different world metropolitan areas in both developed world and developing world have been studied and analyzed to access the main effective factors underlying global economic changes in the world.

## RESEARCH METHOD

According to the essence and research main goal, the research method is Analytical-comparative. Based on the research by comparing the final related reviews with spatial structure have been researched in metropolitan regions and documented researches about different metropolitan areas, it has and have been tried to study the effective factors on spatial changes.

## THEORETICAL APPROACHES

### *Metropolitan Area, Formation and Evolution*

For several years, urban geographers have tried to compile a framework for the explanation of the spatial reality explaining why the inhabitants live outside the metropolitan administrative - political boundaries. They concluded that this cannot be explained by the fact that the space metropolises reality of today, cannot be explained by the metropolitan concept which have taken from the industrial city of twentieth century. It cannot be an appropriate framework for explaining these facts.

Metropolitan is a new phenomenon, affecting the settlement network on a national scale and generally. Moreover it happens to non-metropolitan cities, as well, when they are taking steps in the direction of becoming a metropolis. This process is actually a response to postindustrial economic changes that leads to polarization



and further effects on the metropolitan. Some researchers consider the concept of metropolitan beyond the simple concept of urban growth; In fact, it is a process, as a result, of which occurs the concentration of activities, people, functions and processes, and is associated with the social polarization and spatial dispersal.

### ***Explanatory Patterns of Metropolitan Regions Spatial Structure***

At present time, most large cities around the world are undergoing a process of population suburbanization and employment decentralization characterized by the abandonment of the center of the metropolitan region in favor of more peripheral locations. Suburbanization/ decentralization can be carried out according to a dispersed spatial pattern, in which peripheral land is occupied by fragmented and sparsely populated settlements, or according to a polycentric model, in which peripheral centers emerge (Angel & Lopez, 2010, p.120). In this field, the third model, especially in the research on developing countries has been indicated that neither single-core model features nor the characteristics of multi-core are capable, but at some point between the two are. In other words, this model of policy suggests several patterns of multi core metropolitan regions. This model is known so-called Non-monocentric. Recently, (Fujita & Ogawa, 1982, p. 34) the model has been seen mainly in developing countries, the processes of decentralization and the characteristics of multi-core activity. In addition, Knox and Pinch distinguish on the structural and morphological changes in the patterns of contemporary metropolitans into three distinct periods:

A) The first period of the city of early twentieth century, major elements of urban morphology include a center-city and the central business district (CBD), population densely settled with a surrounding urban halo around the center.

B) In the second period after the Second World War, cars have an obvious impact on city form. But the city of this era already remains single urban center with an old commercial center, the surrounding residential areas and gradual emergence of a population of cells.

C) The third period begins from 1970 onwards when multi central metropolitan areas form. Proliferation of core population and satellite towns around major cities and the encroachment of urban development into surrounding areas are the main characteristics of this period (Knox & Pinch, 2001, p. 134).

Monocentric city is a spatial character of the "nineteenth century city" (Anas et al.,1998), consisting of a compact production core surrounded by an apron of

residences, which has been well modeled in the urban literature since Alonso (1964), Mills (1967) and Muth (1969), and have dominated urban economics for nearly three decades. The monocentric model provides important insights about urban spatial structure and its evolution. In this model, production is concentrated at the central business district (CBD), and rents are high near the center while commuting costs are low. So, locational choice is solely based on the distance to the employment center. In the equilibrium, households living at the central locations will consume small quantities of housing and spend little on commuting, while households which commute longer distances will consume more housing that is cheaper at more distant locations (Mieszkowski & Smith, 1991). The monocentric model has been increasingly criticized recently for its inadequacy to describe the spatial pattern of large modern urban areas, where decentralization of population and employment has taken a more polycentric form, with the emergence of suburban sub-centers independent or subsidiary to the older CBD (Anas et al., 1998). Several studies, e.g. Clark and Kuijpers-Linde (1994), Kloosterman and Musterd (2001), and Champion (2001), have noted that economic restructuring in the globalization era, the development of new transport and information technologies, and changing household composition and commuting patterns all contribute to the current change in urban structure, which has undermined some underlying assumptions of the monocentric model (Kuijpers & Clark, 1994, p. 34, Kloosterman & Musterd, 2001, p.76., Champion, 2001).

### ***Tracing the Influencing Factors on Spatial Structure in the Theoretical Literature***

#### ***Economic Globalization and Spatial Change in Metropolitan Regions***

##### ***Global City-Regions: New Spatial Structure Patterns of Global Metropolitan Regions***

The 'mega-region' recently identified by the Regional Plan Association on the North East coast of the United States will differ in its scale of external economic relations from that of the 'megalopolis' identified by Jean Gottmann in roughly the same location fifty years ago (Regional Planning Association 2006). Likewise, 'mega-city region' functional development identified in the Pearl River Delta and Yangtze River Delta regions of China twenty years ago (Hall, 1999, p. 34). The key distinction between contiguous built urban development, pre-urbanization and urban 'sprawl', which are marked



by local functional connectivities and flows such as daily commuting to work, shopping trips etc., and the global city region phenomenon identified by Scott, is the presence (or not) of active global economic integration across an area larger than Sassen's global city. As Scott has put it: "global city-regions" have become the new scale "at which globalization processes crystallize out on the geographical landscape" (Scott, 2001a, p. 7). They are "an outgrowth of large metropolitan areas – or contiguous sets of metropolitan areas – together with surrounding hinterlands of variable extent" (2001b, p. 814), furthermore, they constitute "spatial nodes of the global economy".

Scott sees city-region economic dynamism as coming from the role of global cities as "superclusters" for "massive recent expansion" of "leading sectors of capitalism"; these "are organized as dense and intensely localized networks of producers with powerful endogenous growth mechanisms and with an increasingly global market reach" (Scott, 2001b, p. 820). He refers to the need for businesses to cluster to gain competitive advantage, citing the work of Porter and Storper (Porter 2001, Storper 1997, referred to in Scott 2001b, p. 817), and to the "organizational outcomes" of large-scale agglomeration – "rich physical infrastructures supplied out of public funds as cities expand", "dense local labor markets" and "residential activities", "consolidation of conventions and cultures" and "above all" their role as "centres for learning, creativity, and innovation... new transactional encounters and experiences" (2001b, p. 819). His regional vision incorporates the special significance of advanced producer services both in the globalization of cities and in the rise of their surrounding, globalizing regions. For Scott then, globalization is leading to a "rescaling... in which national domination of social practice is dissipating upwards to the global and downwards to the local" (Scott, 2001b, p. 183). Furthermore, this makes city regions "active agents in shaping globalization itself" (Scott, 2001a, p. 11), reflecting Kenichi Ohmae's (1995) 'The End of the Nation State' thesis. He reiterates Castells' view that, increasingly, economic exchanges between cities are occurring in a global "space of flows" that is not tied to the "space of places" (regions, and nation states) (Castells, 1996, p. 376–428). Yet significantly, he sees global city-regions as the important new "regional social formations" (Scott, 2001a, p. 1).

Rescaling of localized network connections, the development of external urban relations, and the ways in which the latter define and structure city regions, are therefore key determinants of the degree to which

global cities are really expanding, functionally. These considerations must inform the question to what extent city regions are simply a new scale of a longstanding process of urbanization and to what extent they are becoming increasingly globally constituted and integrated. (Pain, 2012, p. 4).

As analyses by John Friedmann (1986, 1995) and Saskia Sassen (1991, 2000) have demonstrated, specific 'world' or 'global' cities have become strategic sites for the operation of the capitalist world economy and its transnational labor market. Their present-day global economic role has been facilitated by recent major technological and economic transition (Sassen, 2000, p. 129 ; Friedmann, 1995, p. 34)

These tow progress had been formed the most important effects on residential and employment location changes in cities in both developed and developing countries. Twenty years on from Sassen's original analysis, the geography of knowledge-based economic capital is continuing to centre on cities, but cheaper and improved transportation and ICT applications now allow the formation of enlarged, globalizing city hinterlands which, like global cities, are part of a hinter world space. This is the spatial dynamic referred to by Scott as a global city-region (Scott, 2001b, p. 814) and it is distinct from the physical extension of very large mega-cities which are focal points of social reproduction but are presently disconnected from economic vibrancy associated with global city expansion (Pain, 2012, p. 3).

### ***Polycentric Mega- City Region***

The concept of the polycentric Mega-City Region combines different theoretical approaches: John Friedmann's world cities, Saskia Sassen's global cities, Peter

Taylor's world city network and Manuel Castell's space of flows. In the following part, the main ideas of these theories will be explained. Peter Hall and Kathy Pain (2006, p. 3) define Mega-City Regions as follows: "Mega-City Regions are a series of anything between ten and 50 cities and towns physically separate but functionally networked, clustered around one or more larger central cities, and drawing enormous economic strength from a new functional division of labor. These places exist both as separate entities, in which residents work locally and most workers are local residents, and as parts of a wider functional urban region connected by dense flows of people and information carried along motorways, high speed rail lines and telecommunication cables" (Hall & Pain, 2006, p. 3). Based on this definition, POLYNET hypothesize that "... [Mega-City Regions]



are becoming more... [polycentric] over time, as an increasing share of population and employment locates outside the largest central city or cities, and as other smaller cities and towns become increasingly networked with each other, exchanging information which bypasses the large central city altogether (Luthi et al., 2007, p. 3)

Castells has indicated that the new spatial logic of territorial space, which is increasingly dominated by spaces of flows, may be associated with the formation of "multifunctional, multinuclear spatial structures" (1989, p. 167). Sassen has similarly recognized a "reconstitution of the concept of region" (2001, p.5) that is linked into 'global circuits' (Sassen, 2002). In this field there are some main issues which raised from Scott's global city-regions as followings: What are the determinants of global economic integration of multinuclear city regions, How should their boundaries be delineated, How fit for purpose are their management and governance structures (Pain, 2012, p. 5).

In Castell,s point of view, most of the power and management operations in our societies are performed spatially through a combination of territorial concentration and territorial sprawl. Major directional functions, research, innovation, and the sending of symbols and messages are concentrated in some major nodes and hubs around the world, and each country and region have sub-centers that connect electronically and through high speed transportation to the other levels of the command and control system. On the other hand, routine operations, low-level services, residence, and consumption are scattered through the territories of regions, countries, and continents in an increasingly decentralized pattern. The connection between the two processes (concentration and diffusion) is performed by an information technology infrastructure that constructs the space of flows (Castells, 1993, p. 6).

### ***Knowledge-Based Functions and Advanced Producer Services (APS) and The Spatial Structure in Metropolitan Areas***

Another notable issue about the influencing factors of the spatial structure in metropolitan regions, particularly global metropolises is the emergence and development of advanced services, including ICT, transport, international law, insurance, counseling management, advertising and marketing that they are called Advanced Producer Services:"APS"

First of all, advanced producer services have been born into this urban restructuring and mainly in the cities of the world as a product and process (Castells quoted Mohammadi, 45, p. 1391) been formed by the reduction

of traditional and industrial activities. The location of the services, near the manufacturing and export its activities of goods and services, have been effective on the reduction costs and deployment in major metropolitan areas. Also, access to national and international markets are the most important effective factors on the spatial concentration of APS in national and global metropolises. In addition, land price and access to market customers should also be added (Ibid, p. 54).

Spatial reflection of the economic reform process of metropolises, concentration and integration of urban centers in 1960s and subsequently suburbia in the 1970s, are categorized as follows: Hart and Molar divided the process in America into four phases: 1- Bedroom Communities (before 1960s) 2- Regional Shopping Centers (1960-1970) 3- employment centers Growth (1970-1980)4- Development of suburban centers (Since 1980).

Among four phases, the last three are related to the suburbanization of services and households. The most recent type of services suburbia, despite the expansion of the suburbs looking for spatial development of settlement systems and activities, also reside traditionally in the CBD of the main town in metropolitan areas, the most unexpected aspect of spatial changes, urban and metropolitan areas in the recent decade (Aranya, 2008).

Authors such as Stanback (1991), Cervero (1989) have referred to it as the 'new suburbanization' of the 'third wave' which has lead to the formation of 'edge cities' (Garreau, 1991) and 'suburban downtowns' (Champion, 2001, p. 150). Daniels (1985) has indicated that in addition to the suburbanization of services, location change within the city and the city region has been theories in the Multinucleate Model. The model suggests an evolution of a multinuclear city pattern through a series of location and relocation by firms from the early 1960s to the 80s in urban areas of America (Daniels, 1985, p. 111). The 'Seed Pod Model' put forward by Schiller (2001) explains the dynamics of dispersal tendencies from the centre and suggests a cyclical process whereby firms initially locate in prime central locations, expand and then disperse to suburban locations as it becomes too expensive to expand in the CBD (Schiller, 2001, p. 5).

### ***Case Studies in Spatial Structure and Its Trends in Contemporary Metropolitan Areas***

In this section, we try to investigate some cases of metropolitan areas in North America, Europe and Asia. In table 1 we documented some researches which has been conducted about these areas.



**Table 1. Documentation of Studied Metropolitan Areas around the World**

Study period	Researchers	metropolitan areas	Country	Continent
1980	Guiliano and Small	Los Angeles	United States	America
2007	Lee and Gordon	72 metropolitan areas	United States	America
1998	Anas et al	South California	United States	America
1988 till 2008	Guiliano et al	United States metropolitan areas	United States	America
1982, 1999	Aguilera et al	Paris	France	Europe
2005-1991	Angel and Lopez	Barcelona	Spain	Europe
2002	Muniz et al	Barcelona	Spain	Europe
1985, 1997	Alpkokin et al	Istanbul	Turkey	Europe
2009	Sun	Beijing	China	Asia
1987, 1990, 1995, 2010	Sohen, Sohn et al	Seoul, Busan, Gwangju, Daegu, and Daejeon metropolitan areas	South Korean	Asia
2009	Rickwood and Glazbrook	Sydney, Melbourne, Brisbane, Perth and Adelaide metropolitan area	Australia	Asia

The most important factors in spatial changes with their patterns had been extracted through study of above cases. Based on the general change factor, besides the integrated global economy factor, three factors have been identified which in various metropolitan areas have different effects as following:

***A) Communication and Transportation Infrastructure Development and Spatial Changes***

There is an ongoing debate regarding the determinants of these spatial changes. Whereas some studies, such as those by Baum-Snow (2007a, 2007b, 2008), point out the role played by transport infrastructure, particularly in the construction of new highways, to explain 17% of the suburbanization process observed in U.S. cities, others such as Cox et al. (2008) maintain that this percentage is too high, that there are other more important sources of suburbanization (e.g., increasing incomes and increasing car use), and that Baum-Snow’s theoretical developments are based on the monocentric model and as such present a narrow perspective of urban reality (Angel and Lopez, 2010, p. 23).

Rickwood and Glazbrook (2009) investigated and compared spatial structure and commuting in the five metropolitan areas Sydney, Melbourne, Brisbane, Perth and Adelaide. They maintain that within a city, there is a consistent increase in public transport mode share with increasing local density, independent of other factors. There is also a consistent reduction in public transport mode share with distance from the CBD, independent of other factors. The strength of these relationships lessens as more complex measures of urban form and access to public transport are introduced into the analysis, suggesting that local area density and distance from the CBD are useful proxies for transit-based accessibility. Also they pointed out that between cities, public transport mode share is generally higher in cities with higher metropolitan density (Rickwood & Glazbrook, 2009, p.78).

Sohen (2005) in Seoul metropolitan region showed that commuters may not always consider trip distance minimization as the primary factor in deciding their residential locations, workplaces or even commuting routes, and that employers tend to spatially gravitate towards local labor markets. Also the urban density



function showed that density distribution became most concentrated in 1990 and less concentrated afterwards. As a result of the comparison between the spatial structures projected from the commuting patterns and the urban density distribution, it is found that the distribution of employment was consistent between the two distribution patterns while the distribution of employed residents was not (Sohen, 2005, p. 315).

### ***B) Decentralization of Population and Employment and Spatial Changes***

In a research that conducted by Giuliano et al in the United States regarding the metropolitan spatial trends in employment and housing, they showed that Postwar trends to 1980 are extensively documented; population and employment growth decentralized; central business districts (CBDs) declined while new employment concentrations outside the CBD emerged; and metropolitan densities decreased. Furthermore, they found that there are two related literatures that are directly relevant to metropolitan spatial trends: The first body of work addresses the forces for and against the concentration of economic activity; the second applies these forces to the mechanics of clustering within metropolitan areas. Then they analyzed these factors in American metropolitan areas based on the formal census during 1998 up to 2008 and concluded two main results: First, urbanization continues, with 80% of the US population residing in urbanized areas as of 2000. Second, based on county level BEA data, the distribution of population and jobs across metropolitan size categories has been relatively constant for several decades (Giuliano et al., 2008, p. 28).

Muniz et al (2002) have done a research about spatial structure in the case of Barcelona metropolitan region. Their findings indicated that dynamic externalities and urban filtering, as well as private transportation improvements are driving population suburbanization, while in the case of employment, the main static factors seems to be population, income, localization coefficient and firm size. Income, the number of vehicles per worker and the localization coefficient seem to exercise a dynamic suburbanization effect (Ivan et al., 2002, p. 20).

Angel and Lopez (2010) tried to determine whether population suburbanization is occurring in Barcelona and, if so, how it is organized spatially. In doing so, they analyzed the spatial structure of the population of the Barcelona metropolitan region and its evolution between 1991 and 2005. They found that during this same period, the role played by transport infrastructure in determining the spatial structure is becoming stronger. Also, suburban

population growth occurred, during which its main center lost absolute and relative importance in favor of more peripheral locations that, furthermore, are outside the population sub-centers identified in their study (Angel & Lopez, 2010, p. 131).

Aguilera et al (2009) in Paris metropolitan area found a reverse result in the case of employment decentralization and its effects on daily commuting: their results show that the number of reverse commuters has significantly increased because the municipality of Paris has lost many jobs but few working residents, whilst employment has developed in the suburbs. Reverse commuters are mainly and increasingly high-income professionals whose workplace is located close to the central city in employment sub-centers that are well served by public transport. Based on Aguilera, Consequently reverse commuters have lower than average car use although differences exist and are related to their professional status (Aguilera et al., 2009, p. 685).

In the east of Europe and in Turkey, Alpkokin et al (2007) investigated Dynamics of clustered employment growth and its impacts on commuting patterns in rapidly developing cities. They analyzed impacts on commuting patterns (trip lengths, employment destination zonal preference functions and mode shares) for each type of sub-center identified in Istanbul are found that there are four distinct types of employment cluster located in the area of more than 150,000 hectares (Alpkokin et al., 2008, p. 442).

In Asia, Son (2009) in a study of distribution patterns of both population and employment in the Beijing metropolitan area found that the suburban areas adjacent to the central area are the most balanced with people and jobs, corresponding to the emerged sub-centers in the near suburbs. Also he tested relationship between jobs-housing balance and urban commuting through regression analysis. The results show that balancing people and jobs by configuring land use patterns seems not quite relevant to shortening commuting durations (Sun, 2009, p. 312).

Sohn et al (2010) analyzed spatial changes and structural transformations in five Korean mega-cities using populations and the number of tertiary industrial workers as variables. Their result show that cities that accommodated immigrants earlier tended to undergo suburbanization during the period from 1995 to 2000. The suburbanization forced people out into suburban areas, increasing the population in those areas and giving birth to new centers and sub-centers in suburban areas from 2000 to 2005. According to their result, Spatial de-correlation between the population and the establishments was the second feature of note. The population tended to



be suburbanized and dispersed centrally in most of the mega-cities, while workers tended to be concentrated in the central areas of the cities (Sohn et al., 2010, p. 206).

### ***c) Economic Restructuring, Relationships Between Institutes and Spatial Changes***

Anas et al (1998) found that an important source of current change in urban structure is the changing economic relationships within and between firms. Telecommunications, information-intensive activities, deregulation and global competition have all contributed to changes in the functions that firms do in-house and in how those functions are spatially organized (Anas et al., 1998, p. 2).

In this issue, standard urban economic theories suggest that the fundamental determinant of the spatial structure of cities is a trade-off between two opposite forces: the propensity of economic agents to interact (the cost of interaction) and their aversion to crowding (the cost of congestion), and different combinations of the forces engender different spatial distributions of agents, such as an even or concentrated pattern, or a monocentric or polycentric configuration (Papageorgiou & Pines, 1999).

## **CONCLUSION**

In this study, spatial trends in metropolitan areas of developing countries and developed countries particularly in recent decades were studied and recognized in the field of theoretical approaches and experimental studies through a review method and using international recent literature. To deepen the study and its thematic universality some examples of North America, Europe and Asia were examined. Some important findings of this study are the following.

Five factors of macro change including two factors of economic globalization and its effects on production supporting advanced services were derived from theoretical approaches and three factors of communications infrastructure, decentralization of population and employment, and relationships between institutions and companies were identified in experimental studies. But they all have one major factor in the context of the global economy was based on interpretation and analysis. In this context, as Castells highlights the new spatial logic of metropolitan areas has been captured by procedure spaces replaced by place spaces along with globalization.

Also Friedmann and Sassen emphasis on global city-regions have become the strategic locations for the

operation of the capitalist world economy and labor market transfer. Their current role in the global economy through new technological and economic development is facilitated. Consequently, the two main functions have had main effects on residence place shifting and urban employment and during recent decades, have formed the main features of contemporary metropolitan areas in both developed and developing countries.

The role of advanced producer services should also be considered among the factors that has caused to change in the organization of economic institutions in the metropolitan regions and through factors such as locating the services near the location and relating the location of production activities and exports of goods and services, reduce costs and establishment in metropolitan areas, Access to national and international markets, and finally land price and access to market customers, that are the main important factor influencing spatial concentration of APS on national and global metropolis, have influenced the characteristics of the spatial structure of metropolitan areas.

Moreover, the studying of metropolitan regions spatial characteristics in the world shows that spatial changes trend in metropolitan regions among each group of developed countries and developing countries, according to the diverse roles of different actors is minimal procedural difference: In developed countries while decentralizing employment in the metropolitan area of Paris transferred to sub-centers and populations are located mainly in the center of Paris, the population and jobs in American cities and suburbs has transferred the flow of daily job journeys. So these flows of commuting in Paris and Los Angeles metropolitan areas, for example, are quite different.

But in developing countries, through studying the metropolitan areas in Seoul, Beijing and Istanbul, we can say that they have been the same process of decentralization of population and activity but with different nature and pattern from western cases. The common point is that almost all the structures have been kept out of the monocentric and have entered to polycentric metropolitan structure. Also being monocentric is so different in developing countries and developed countries. In developed countries especially in USA one of the sensible specifications in metropolitan regions is the appearance of edge cities which Joel Garreau debates as new forms of metropolitan regions in America which have been formed by the influence of comparative free decision-making of private sector and the entity of enterprises (meck, 2012, p. 124).

In general, by studying the effective factors



influencing spatial changes in metropolitan regions, there are two forces that have played main role in spatial changes in the depth of macro factors: Economic forces - technological, affected by the global economic integration, developments and improvements in communication among financial institutions, that are influenced by advances in communication technology and ICT. Also the political forces - planned over the last few decades of centralization and decentralization have been set the path of metropolitan regions and spatial characteristics of the developed and developing countries.



## REFERENCES

- Aguilera, A, Wengleskiand S, & Proulhac, L. (2009). *Employment Suburbanisation, Reverse Commuting and Travel Behavior by Residents of the Central City in the Paris Metropolitan Area*, Transportation Research Part A, N, 685–691.
- Alpkokin, P., Cheung, C., Black, J. & Hayashi, Y. (2008). *Dynamics of Clustered Employment Growth and its Impact on Commuting Patterns in Rapidly Developing cities*, Transportation Research Part A, Vol 42.
- American Planning Association. (2006). *Places and Place Making, Recent Theories: dispersed city, edge city, peripheral city*, Mostafa behzadfar translation, urban development engineers association publications.
- Anas, A., Arnott, R. & Small, K. (1998). Urban Spatial Structure, *Journal of economic literature*, pp 1426-1464.
- Àngel, M. & López, G. (2010). Population Suburbanization in Barcelona, 1991–2005: Is its spatial structure changing? *Journal of Housing Economics*, 19, 119–132.
- Baum-Snow, N. (2007). Suburbanization and Transportation in Themonocentric Model. *Journal of Urban Economics*, 62, 405–423.
- Baum-Snow, N. (2008). Reply to Cox, Gordon, and Redfean’s comment on “Did highways cause suburbanization?”. *Econ Journal Watch*, 5, 46–50.
- Bertaud, A. (2002). *The Spatial Organization of Cities: Deliberate Outcome or Unforeseen Consequence?* World Development Report 2003, Dynamic Development in a Sustainable World. Background paper.
- Camagni, R. & Salone, C. (1993). Network Urban Structures in Northern Italy: elements for a theoretical framework. *Urban Studies*, 30, 1053–1064.
- Castells, M. (1993). Why the Mega Cities Focus? Megacities in the New World Disorder, *Mega-Cities 7th Annual Coordinators Meeting in Jakarta*, Indonesia.
- Champion T, (2001). Urbanisation, Suburbanisation, Counterurbanisation, and Reurbanisation, in Paddison, R. ed. *Handbook of Urban Studies* (Sage, London)
- Champion, A.G. (2001). A Changing Demographic Regime and Evolving Polycentric Urban Regions: Consequences for the size, composition and distribution of city populations, *Urban Studies*, 38 (4), 657-677.
- Clark, W.A.V & Kuijpers-Linde, M. (1994). Commuting in restructuring urban regions, *Urban Studies*, 31 (3), 465-483.
- Cox, W., Gordon, P. & Redfean, C.L. (2008). Highway Penetration of Centralcities: not a major cause of suburbanization. *Econ Journal Watch*, 5, 32–45.
- Daniels, P.W. (1985). *Service Industries: A geographical appraisal*, (Methuen, London).
- Evans, A. (1976). Economic Influences on Social Mix. *Urban Studies*, 13, 247–260.
- Friedmann, J. (1995). *Where we stand: a decade of world city research*, in Taylor, P.J.
- Knox, P. & Pinch. L. (2001). *World Cities in a World-System*, Cambridge: Cambridge University Press, 21-47.
- Fujita, M. & Ogawa, H. (1982). Multiple equilibria and structural transition ofnonmonocentric urban configurations, *Regional Science and Urban Economics*, 12, 161-196.
- Guiliano, G., Agarwal, A. & Redfean, C. (2008). Metropolitan Spatial Trends in Employment and Housing Literature Review, Special Report 298: Driving and The Built Environment: The Effects of Compact Development on Motorized Travel, *Energy Use*, and Co2 Emissions.
- Hajipoor, Kh. (2008). *Explanation of Tehran metropolitan area formation*, Ph.D theses, Tehran university.
- Hall, P. & Pain, K. (2006). *The Polycentric Metropolis: Learning from Mega-City-Regions in Europe*, London: Earthscan.
- Hartshorn, T. A. & Muller P.O. (1986). *Suburban Business Centers: Employment Implications*, U.S. Department of Commerce, Economic Development Administration, Washington D.C cited in Stanback,1991 and Champion, 2001.
- Muñiz, I., Galindo, A. & Miguel A, G. (2002). *Urban Spatial Structure and Suburbanisation*, Universit at Autònoma de Barcelona.
- Khan, M.E. (2000). The Environmental Impact of Suburbanization. *Journal of Policy Analysis and Management*, 19, 569–586.
- Kloosterman, R.C., & Musterd, S. (2001). The Polycentric Urban Region: Towards a Research Agenda, *Urban Studies*, 38 (4), 623-633.
- Lang, R.E., & LeFurgy, J. (2003). Edgeless Cities: Examining the Noncentered Metropolis, *Housing Policy Debate*, 14 (3), 427-460.
- Lee, B., Gordon, P. (2009). forthcoming. Urban spatial



- structure and economic growth in US metropolitan areas, *Journal of Regional Science*.
- Lüthi, S., Goebel V. & Thierstein, A. ( 2007). *Spatial Development on the Quiet in the Mega-City-Region of Munich*, ERSA-Conference Paper, Munich.
- McMillen, D.P. (2003). Identifying Sub-centres Using Contiguity Matrices. *Urban Studies*, 40, 57–69.
- Mieszkowski, P., & Smith., B. (1991). Analyzing Urban Decentralization: The case of Houston, *Regional Science and Urban Economics*, 21 (2), 183-199.
- Mieszkowski, Peter & Mills., E. (1993). *The Causes of Metropolitan*.
- Montgomery, M.R. (2003). *Cities Transformed: Demographic Change and Its Implications in the Developing World*, National Academies Press.
- Nijkamp, P., Finco, A. (2001). *Sustainable Cities and Spatial Footprints*. Paper Presented at the XXVII Reunión de Estudios Regional. Madrid, November 28–30.
- Pain, K. (2012). *Spatial Transformations of Cities: Global City-Region? Mega-City Region?* International Handbook of Globalization and World Cities Cheltenham, UK, Northampton, MA, USA: Edward Elgar, 83-93.
- Papageorgiou, Y.Y., & D. Pines. (1999). *An Essay on Urban Economic Theory*, Boston:Kluwer Academic Publishers.
- Aranya., R. (2008). Location Theory in Reverse: An Evolutionary Model of Location for Global Production in the IT Industry of Bangalore, *Journal of Environment and Planning A*, 40 (2), 446-463.
- Regional Plan Association, (2006). *America 2050: A Prospectus*, New York: Regional Plan Association.
- Rickwood, P. & Glazebrook, G. (2009). Urban Structure and Commuting in Australian Cities, *Journal of Urban Policy and Research*, Vol. 00, No.18.
- Sassen, S. (2000). *Cities in a World Economy*, Thousand Oaks: Pine Forge Press.
- Schiller, R. (2001). *The Dynamics of Property Location: Value and the factors which drive the location of shops, offices and other land uses* (Spon Press, London)
- Scott, A. J. (2001b). Globalization and the Rise of City-Regions, *European Planning Studies*, 9 (7), 813-826.
- Sohn, J. (2005). Are Commuting Patterns a Good Indicator of Urban Spatial Structure? *Journal of Transport Geography*, 13, 306–317.
- Sohn, H., Kim, T., Lee, J. & Kim, H. (2010). Spatial Analysis of Urban Structure Changes in Korean Mega-Cities, *Journal of Asian Architecture and Building Engineering*, 201-206.
- Sun, T. (2009). *Population and Employment Distribution and Urban Spatialstructure: an Empirical Analysis of Metropolitan Beijing, China in The Post-Reform Era*, A Dissertation Presented to The Faculty of The Graduate Schooluniversity of Southern California in Partial Fulfillment of the Requirements for the Degree Doctor Of Philosophy (Planning).
- Taylor, P. J. & Pain, K. (2007). *Polycentric Mega-city regions: Exploratory Research from Western Europe*, The Healdsburg Research Seminar on Megaregions, Todorovich, P. (ed.), Lincoln Institute of Land Policy and Regional Plan Association.
- Zebardast, E. & hajipoor, Kh. (2008). Explanation of Metropolitan Areas Formation and Change, *human geographic research*, 69, 105-121.
- Zebardast, E. (2005) *Metropolitan Areas Management*, Center for Urban Development and Architecture Research, Ministry of Road and Urban Development.
- Zenou, Y. (2012). *Urban Labor Economics*. Chap. 3: Non-Monocentric Cities and Search-Matching, 121-166.
- Mohamadi, A., Sarafi, M. & Tavakolinia, J. (2012). *Corporative Geography Advanced Producer Services in the Case of Tehran Metropolitan*.

