New Migration Destinations and Agglomeration Economies in the United States

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Population Association of America. 2011 Anual Meeting. Washington D. C.

Topic 6. Migration, Neighborhoods and Urbanization

Session 601. Immigrant Destinations: Issues and Impacts.

Abstract:

Latino immigrants, regardless of their abilities, have been historically settled in the so called traditional migration destinations such as the State of California and others. Nevertheless, migration destinations exhibited an important geographical turn in the nineties since they started to feature regional dispersion, situation known in the literature as the emergence of "new immigration destinations." This paper contributes to the understanding of this discussion by analyzing the role of agglomeration economies, as suggested by the theoretical framework of the New Economic Geography, to explain the formation of new Latino migration destinations in the USA during the period 1980-2007. Our results show that the new migration destinations can be in part explained by agglomeration and congestion economies that have impacted firms and migrant worker mobility decisions.

Introduction

The immigration pattern in the United States has displayed an interesting feature during recent decades, which consists in a change in the process of foreign-born population mobility that substitute traditional immigrant regions for "new growth states" (Passel y Suro 2005). From an economic perspective, typically the explanation of new migration destinations would rely on studying wage differentials between origin and destination areas. However, under these traditional perspectives wages are in somewhat given, in the sense that the modeling strategy does not take fully into account the economic forces that determine wage differentials and by extension labor mobility. With this respect, the theoretical perspective of the New Economic Geography (Fujita-Thisse, 2002) offers an explanation of these regional forces (that attract or repulse firms and workers) through modeling agglomeration and congestion economies. We consider that the New Economic Geography (NEG) can be a reliable explanation for the new migration destinations in the USA. Besides, one important advantage of the NEG perspective is that makes the spatial (geographical) dimension, contained in the wage differentials across labor markets regions, explicit in the modeling of migration process.

In this paper, the new migration destinations in the USA at county level are studied as a geographical diversification of migration flows. Our central hypothesis is that new migration destinations must exhibit spatial concentration because agglomeration and congestion economic forces are playing an important causal role in the developing of these regions. This study focuses in the Hispanic migration at county level. In section 1, we make a review of the theoretical economic models of migration and also we provide stylized facts to identify agglomeration economies role in the determination of migration flows. In section 2, we rely on Exploratory Spatial Data Analysis (ESDA) to highlight the spatial features of the Hispanic migration flows at county level. In the third section, it is described a formal model proposed by Crozet (2004) under NEG approach to explain migration flows through agglomeration economies. Finally, in the section 4, we propose a spatial econometric implementation of a simple version of the core-periphery model *a la* Crozet (2004) to show the importance of the market access effect on the new migration destinations. We conclude with a section of final considerations.

1. Migration theory and Agglomeration Economies

Labor migration, both internal and international, responds in some extent to economic differentials at the regional level, mainly to wage differentials. An economic standard model of migration assumes two regional labor markets (north and south) in a region with free mobility of the labor force and similar skills. If average wages in the north are greater than wages in the south, workers move to the north pursuing higher wages and higher level of utility. The unfolding story of this is a single regional wage that eliminates wage differentials because labor mobility forces wages down in the north. (Borjas 2000)

The above result "can be enough" to explain internal migration, but in the case of international migration other factors as race, distance, legal provisions, etc. must be considered. International migration has been studied from the perspective of economic development, which postulates that migration is caused by geographical differences in the regional labor markets that explain differences in the endowments of capital and labor. . The wage gap between developed and developing countries encourages lower wage workers country migrate to countries with higher wages;and in the long run, migration causes a tendency of wage equalization in both countries. ; and the only prevailing wage differential would be costs of international movement, which are mostly psychological. (Lewis 1954; Ranis y Fei 1970; Harris y Todaro 1970).

Migration decisions are explained by Sjaastad (1962), who argue that migration is a type of investment which increases human productivity in an individual sense. A potential migrant evaluates economically costs and returns associated to mobility. Migrant´s costs and returns are classified into monetary and nonmonetary under the assumption that wages are market determined and there are no barriers to labor mobility and other inputs among industries or regions.[1]In this sense, the decision to migrate is like an investment in human capital where net present value of the future income less costs (attributed to the movement) are calculated (Borjas 2000). This framework can be adapted including the probabilities of finding a job and of being deported (in the case of undocumented migrants)

[1] In addition to these costs and benefits that are called private costs, the individualis faced with social costs and benefits, which in this analytical framework are introduced as externalities such as tax structures, school systems, among others. For further reference of each of these elements see Sjaastad (1962).

in the destination and; also including the likelihood of finding employment in the place of origin to obtain the expected income differential. This last perspective emphasizes that who migrates makes a rational valuation of costs and benefits individually. In contrast, the new economics of migration argues that the migration decision is made at the household level, i.e. a collective decision made by a family or household in order to maximize income and minimize risk in their welfare. Households have the ability to reduce risk through diversification in the allocation of resources of their home or family . That is, the family decides who members will be allocated to economic activities in the place of origin and who are allocated to other places making explicit the differences between the labor markets of origin and destination. (Stark y Levhari 1982; Katz y Stark 1986; Lauby y Stark 1988).

Remittances and mechanisms of risk reduction are two ways that families use to maximize absolute income and minimize risks of loss of income. Typically, families reduce the risk of loss of income through remittances from relatives who are in the destination. On the other hand, in destination places (developed countries), the risks of household income are minimized by private insurance markets or government programs because it is assumed that in places of origin (developing countries) the institutional mechanisms are imperfect, absent or inaccessible to poor families. Likewise, the new economics of labour migration also argues that households not only decide to send migrants to increase family income in absolute terms, but also to increase the relative income compared to other households in their home community. The aim is to reduce the so-called relative deprivation compared with other households. Therefore, relative deprivation highlights the distribution of income in the place of origin. If income of rich households increases while income of poor households remains constant, then the relative deprivation of the latter increases. By increasing the relative deprivation, the poor household's utility is negatively affected, which causes to expand incentives for the household members to migrate. (Stark y Taylor 1991)

An increasingly important aspect in the study of migration is the human capital embodied in the migrant. The literature indicates that human capital determines what type of migrants move in relation to the to the wage distribution in the origin. Borjas´ hypothesis (1987) about self-selection of migrants is based on the idea of income maximization (Roy 1951). The hypothesis is that migrants do not move randomly from the country of origin

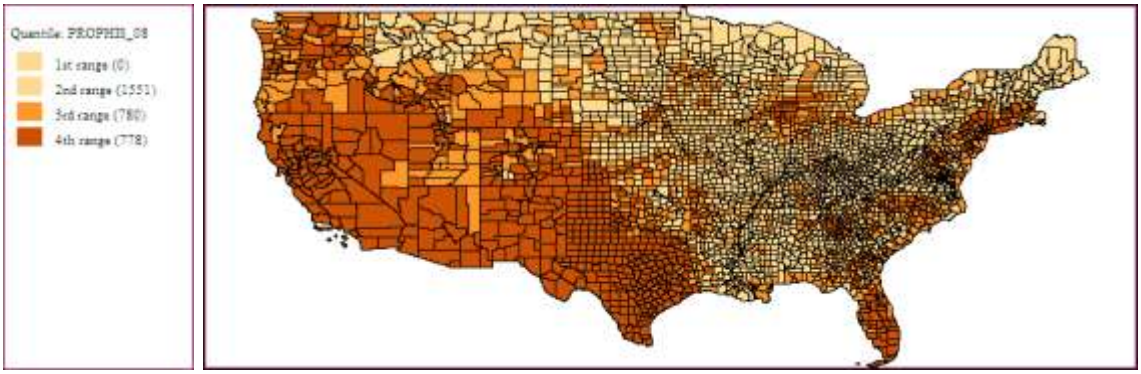
because they are evaluating their skills returns in local (origin) labor markets.Assuming that skilled workers may move freely among regions and that workers with higher skills will move to high income countries, , it can be derived two types of selection that characterize migration flows (Borjas 2000):1) Positive selection occurs when migrants have above average skills (Migrant flows from the site of origin to the destination site are positively selected when the destination offers a higher return rate to skills). and; 2) Negative selection occurs when migrants have below average skills (Migrant are negatively selected when the destination region offers higher returns to skilled workers, so that less skilled workers will leave the region of origin). Under this perspective, a branch of the literature analyzes migration flows (Chiquiar and Hanson 2005). In general, the determinants of migration flows that have been identified by the literature are: *age*, since migration is common among young people; *education*, because migration is common among workers with higher education; *distance*, the smaller the distance, the greater the propensity to migrate (Borjas 2000). Other determinants are, trade, population growth at the origin, the ratio of per capita income between the origin and destination, the stock of immigrants as a proportion of the population at destination in previous period (Mitchell and Pain 2003), unemployment, foreign direct investment (Mendoza 2006), political factors (asylum, immigration and work restrictions), living standards, social networks, (Rotter and Vogler 1998), macroeconomic variables (Bruker and Siliverstovs 2004), among others.Likewise, the self-selection approach is accompanied by a sorting explanation of migrants in destination sites. Migrants from any sending country should be classified according to the yields that their skills would produce in other destinations. (Grogger and Hanson 2008). Thus, workers with lower skills move to regions with lower return rates , while more skilled workers choose regions with higher rates of returns ;finally, workers with average skills will move to regions with average rates of return. (Borjas,Bronars and Trejo, 1992). One aspect to highlight is that self-selection and sorting are independent events. While selectivity of migration depends on the returns to skills in the country of origin (among other factors), migrant sorting depends on the returns to skills in the country of destination.

So far, we have exposed the main neoclassical economic explanations about migration decisions; additionally, the economic approach has also analyzed the type of economic impacts in the origin and destination places that migration cuases:

assimilation and job search of migrants in destination (Borjas 1999, Borjas 2000, Lalonde and Topel 1990), welfare (Borjas 2000 and 2001), brain drain, drain gain (Kanbur and Rapoport 2005, Beine, Defoort and Docquier and 2005, and Docquier 2006) and economic convergence (Solow 1956, Ramsey 1928 and Braun 1993) The theoretical explanations of migration flows discussed above are quite similar in assumptions, consequences and mechanisms. But two features must be highlighted. The first is the wage differential as a result of differentials in labor and economic structures between sites. The second is the space issue, i.e., economic differentials exist because economic activity in a country-region contained in a specific geographical area . These two features are implicit in any analysis of migration processes and they must be taken into account, seriously, in the explanation and prediction of labor mobility. In this sense, the migration neoclassical approach tends to impose small spatial heterogeneity in their models (Borjas, 1999). Migrant flows follow a pattern that is far from being homogenous.

For example, see map 1 that displays, the regional distribution of Hispanics respect to the total of U.S. population at county level in 2008. Map 1 shows that in fact the largest concentrations of Hispanic population in 2008, is concentrated in counties belonging to seven states, : California, Nevada, Arizona, New Mexico, Colorado, Texas and Florida.

Map 1. Share of Hispanic Population to total population. United States 2008.



Fuente: Elaboración propia con base en US Census Bureau (2009)

Given the spatial pattern displayed in map1, a question that arises is if there is any spatial-regional economic force (beyond wage differentials) that explain precisely the

spatial configuration of hispanic migration in USA. In the following section will discuss a theory of economic geography that provides a possible answer.

2. Agglomeration economies and migration.

Agglomeration of economic activity in space is an aspect of economic analysis at the regional level that has become relevant in recent decades. Agglomeration or concentration is a topic studied by economic geography , as a feature of the spatial organization of economic activity. Fujita and Thisse (2002) argue that the concept of agglomeration economies refers situations, in where high income nations are clustered in industrial centers and per capita productivity declines the greater the distance from these centers. In addition, regions within countries are clustered in high growth rates, sites clustered by industry specialization, industrial business districts with high technology are clustered producing linkages and trade among them.

Before discussing the theory of agglomeration from economic geography, it is useful to distinguish between the concepts of concentration and agglomeration. Both concentration and economic agglomeration refer to how the economy or a part of it is distributed in space, for example, if a specific part of economic activity can be found in a few locations, either a city, or country. The basic distinction between these two concepts is that while concentration analyzes the spatial localization of sectors or industries, agglomeration analyzes location in space of economic activity, such as the manufacturing sector as a whole. (Brackman, et. al. 2009). Specifically, we can postulate that agglomeration is the spatial distribution of aggregate economic activity.The study of agglomeration from this perspective has been addressed byeconomic geography. Cronon (1991) in a way that economic activity is determined geographically by two natures. The first nature, indicates that agglomeration of economic activity in space is due to the distribution of natural resources as raw materials, climate, landforms and natural means of transport (such as rivers). In this sense, first nature determines the agglomeration of economic activity by the characteristics of the sites which are given exogenously; in contrast, the second nature establishes that agglomeration is endogenous to economic activity as a result of human actions to seize the first nature. (Combes, et. al. 2008). In the case of the first nature explanation for economic agglomeration, we can find in economic

theory explanations based on comparative advantages and technology that have formulated under the influence of Ricardo´s classical trade model and, more recently, Hekscher-Ohlin model of international trade. These approaches focus to explain patterns of specialization, production and trade among countries. In the case of second nature approach, economic agglomeration is result of external economies. Positive externalities or economies of agglomeration in economic theory are classified in two types: urbanization economies and localization economies (Graham 2007), The first refers to inter-industrial external economies of scale , while localization economies to external economies of scale in specific industries. (Brackman, et. al. 2009).Some authors postulates that urbanization economies are determined by site amenities and nice weather, proximity to oceans and lakes, beautiful places, quality of life, global-type cities, suitable employment, etc.(Partridge 2010). While the economic agglomeration caused by localization economies can be attributed to three *marshallian* types of external economies, proposed by Marshall (Combes, et. al. 2008): 1) Specialized inputs distribution whose unit costs are lower when demand for these inputs is high enough, 2) Thick labor local markets that allow matching jobs and workers; and 3) Intense exchange of ideas and spillover effects that increase productivity and trigger growth.

Most of the literature departs from these three externalities or any of them to build up formal explanations where economies of agglomeration are considered (Duranton and Puga 2004, Ottaviano and Thise 2004). In addition to Marshallian externalities, the literature postulates that imperfect competition in markets also creates economies of agglomeration. For example, firms that maximize their profits in a context of imperfect competition set prices because they depend on the spatial distribution of firms and consumersThe structures of imperfect competitive markets are two main types: monopolistic competition and oligopolistic competition. (Combes, et. al. 2008).

Economies of agglomeration explained by externalities of localization economies type are those that have been modeled mostly. The differences between the models lie in the fundamentals in which these forces are analyzed. The main fundamentals are: price mechanism, rent of land, increasing returns, transportation costs, externalities, monopolistic competition , among others[2].

[2] For a detailed review of these fundamentals see Fujita and Thisse (2002).

Literature on agglomeration economies shows a common element in where spatial configuration of economic activity is result of a process that involves two types of forces: agglomeration forces (centripetal forces) and dispersion forces (centrifugal forces). In the empirical literature these agglomeration and dispersion forces can be analyzed through five empirical components from the perspective of localization economies (Brackman, et. al. 2009). 1) Home market effect. Regions with high demand for goods produced by industries with increasing returns produce more and are net exporters of these goods. 2) A large potential market increases prices of local factors. A large market increase demand for local inputs, and this increases the factor prices. 3) A strong market potential induces economic factors to move. Production factors with free movement will be attracted to those markets in which companies pay relatively high prices to production factors. 4) Shocks sensibility. Changes in economic environment may trigger a change in equilibrium spatial distribution of economic activity. This hypothesis postulates the existence of multiple equilibria in models of economic geography. 5) Reduction in trade costs lead to agglomeration, at least until a critical level of transportation or trade costs is reached.

In terms of our research is important to establish how migration can be explained by agglomeration economies. In this sense, domestic market effect due to increasing returns industries would create a large market potential that increases local factors prices, attracting factors of production such as labor. Specifically, the economic geography literature that attacks the understanding between migration and agglomeration economies is the so-called New Economic Geography (NEG), mainly through the center-periphery model. Fujita, Krugman and Venables (2000) consider the existence of agglomeration economies that allow concentration of economic activity in space because of increasing returns to scale and a market structure of imperfect competition. In a seminal paper, Krugman (1991) developed a model of this type assuming increasing returns and imperfect competition as the basis of agglomeration economies. At the site where the centripetal forces operate, agglomeration of economic activity (center) is triggered, producing a wide variety of goods ("love of variety") that attract workers from the periphery. In particular, there is a migration economic literature that focuses in the context of the center-periphery model of the NEG. (Holmes 1996, Thiessen and Van Oort 2001, Crozet 2004). Likewise, other models have been incorporated into this framework to analyze migration heterogeneity (Russek 2009, Moretti 2010), skilled workers and human

capital (Sanchis-Guarner, and Lopez-Bazo 2006), labor market frictions (Epifani and Gancia 2003) taxes (Hafner 2005), etc..

Finally, the relationship between migration and agglomeration economies also has been discussed in a literature outside the framework of the NEG, mainly by economies of urbanization or amenities (Glaeser, et. al. 2001, Partridge and Rickman 2003, Storper and Scott 2009, Patrigde 2010, Marchiori, et. al. 2010). Moreover, there are also other approaches that attempt to model agglomeration economies in conjuntion with spillover effects (Hirose 2005) and information asymmetry (Berliant and Yu 2010).

New Migration Destination of Hispanics in United States: Stylized Facts

Theory and empirical evidence exposed in the latter section propose that migration flows have a spatial characterization, i.e. that there are places in which regional economic heterogeneity determine migration flows. These sites, in principle, can be characterized by increasing returns and external economies that trigger agglomeration economies. And these centripetal forces attract workers. In this sense, we can find in thethe New Economic Geography propose formal frameworks that model the relationship between agglomeration economies and migration (Crozet 2004). Moreover, from our perspective, before modeling these processes, it is important to indentify first whether or not migration conveys a spatial characterization. A useful technique to address this issue is exploratory spatial data analysis (*ESDA*). In this section, we explore spatial diversification of Latino migrant flows to new destinations places in the United States.

In the United States of America has emerged a new pattern of the flow of immigrants that consists in strong internal migration of foreign-born populations from states with large settlements toward new new states, which are called "new growth states" (Passel and Suro 2005). In addition, Duran, Massey and Capoferro (2005) show that in the case of Mexican migrants in the United States , it is indentified geographical diversification during different periods being the last period characterized by new destinations. These authors point out that there are 4 factors that determine these new destinations : 1) the dramatic increase in the costs and risks of crossing San Diego-Tijuana border, 2) deterioration of the economy of California and its respective anti-immigrant policy, 3) sudden privileges of free movement of undocumented migrants in the United States

established decades ago through the IRCA policy and 4) the emergence of a strong demand for labor throughout the country.

As it is said above, ESDA[3] is a useful technique that helps to show the distribution of economic phenomena in space, and in this case will help us to analyze the new migration destinations of Hispanics in the United States at county level. In all cases that folow, ESDA is performed through open source software called GeoDa [4].

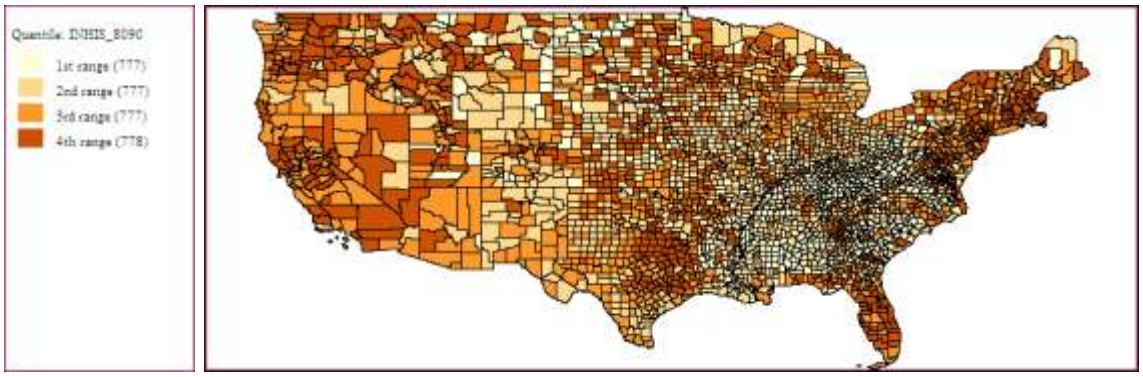
Panel chart 1 shows distribution by quartiles of the Hispanic population growth rates in the United States counties from 1980 to 2008. Four regions are detected in the maps (the intensity of the color detects the dynamics of the county). When map (A) is compared with maps (B), (C) and (D), itis clear that the most dynamic region from 1990 to 2000 shifts toward counties associated to "new migration states" such as Minnesota, Iowa, Arkansas , Kentucky, Tennessee, South Carolina, North Carolina, Virginia and Georgia . From 2000 to 2007,other counties from South Dakota, North Dakota, West Virginia, Maryland, Utah and Montana must be also included in the "new destinations". The last map of the panel corresponds to the growth between 2007-2008, and it suggests that counties from Colorado, Wyoming and Idaho are now part of the "new destinations cluster."

Panel Chart 1. Quartile analysis

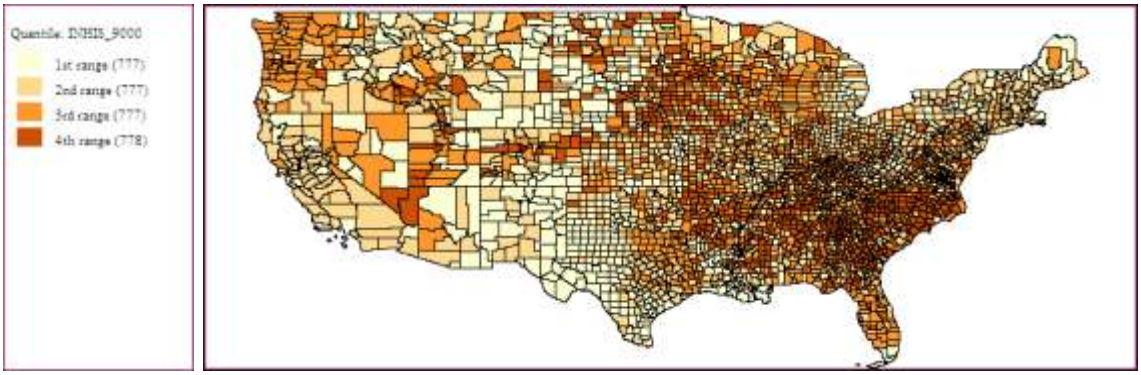
(A) 1980-1990

[3] ESDA summarizes spatial properties of the data, detects spatial patterns, helps to make assumptions about the geography of the data, identifies cases and sub sets of unusual cases, etc.. Anselin (1988 and 2005) explains the basic principles of this technique.

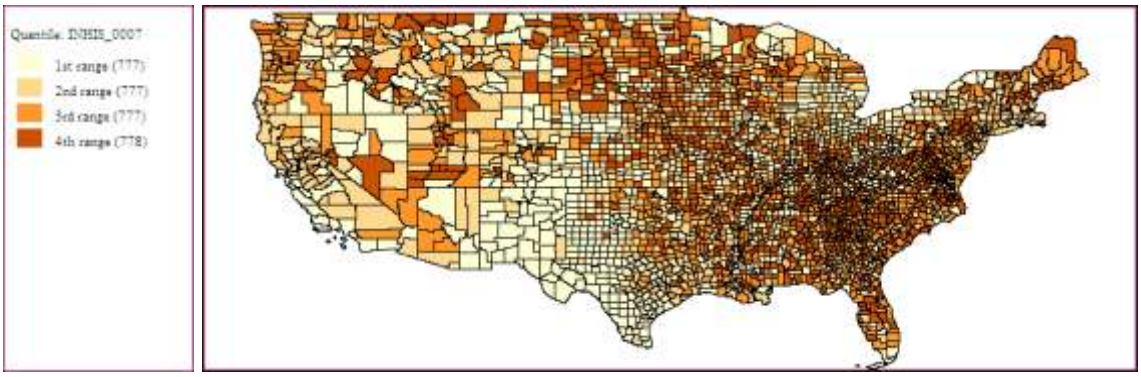
[4] GeoDa software was developed by Luc Anselin and can download it freely from the website of Geoda Center at the following address: http://geodacenter.asu.edu/.



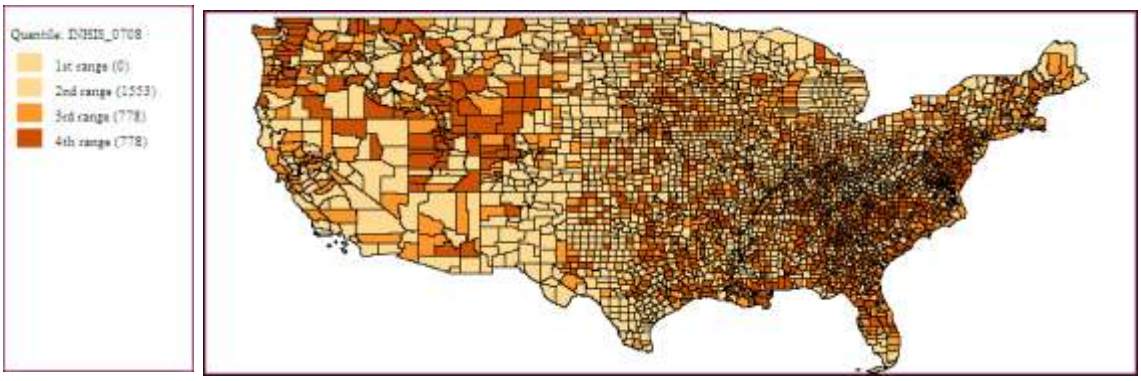
(B) 1990-2000



(B) 2000-2007



(D) 2007-2008

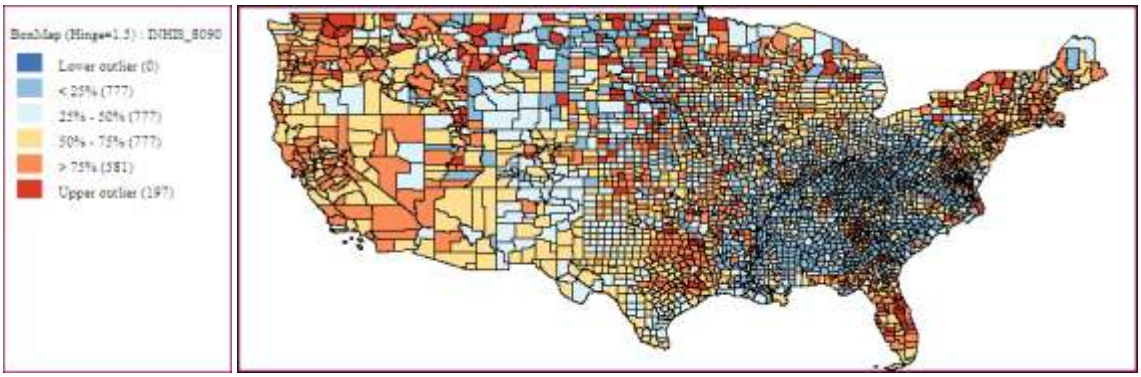


Source: Autor`s Calculations base on U.S Census Bureau (2009)

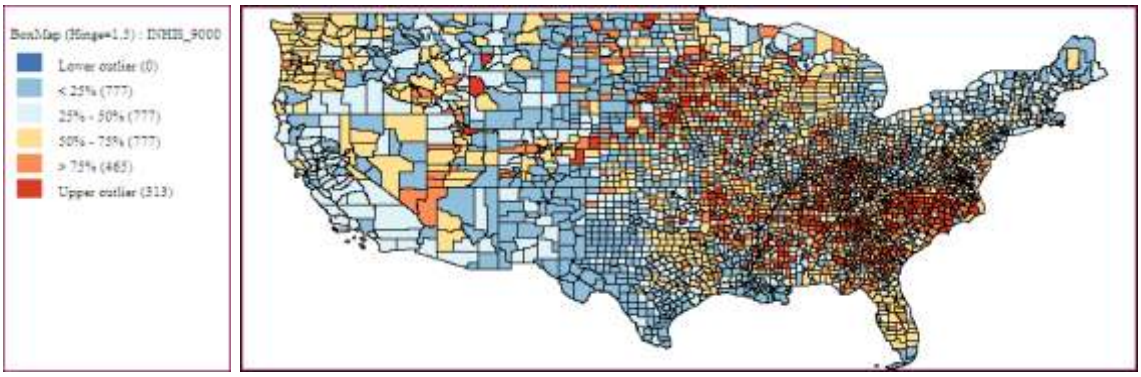
Box maps analysis provide additional evidence to highlight the existence of a group of counties with growth rates outliers, well above the others in the fourth quartile (red) and far below the first quartile (blue). Panel Chart 2 shows that while from 1980 to 1990 extreme growing counties were located in the old (traditional) destinations , 1990-2000 period shows a clear change where a new area of 313 new destinations with high dynamics is formed. These new destinations correspond to the states of Arkansas, South Dakota, North Carolina, South Carolina, Georgia, Kentucky, Tennessee, Mississippi and Virginia.

Panel Chart 2. Box-Map analysis

(A) 1980-1990



(B) 1990-2000

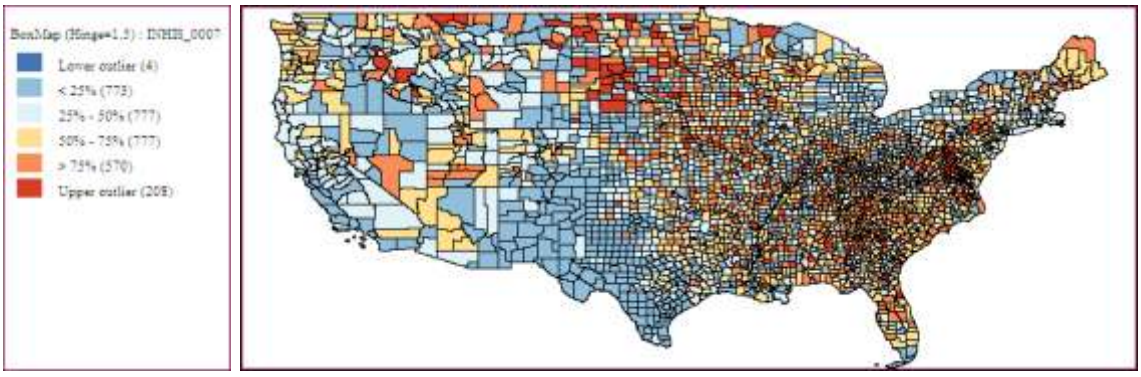


Source: Autor`s Calculations base on U.S Census Bureau (2009)

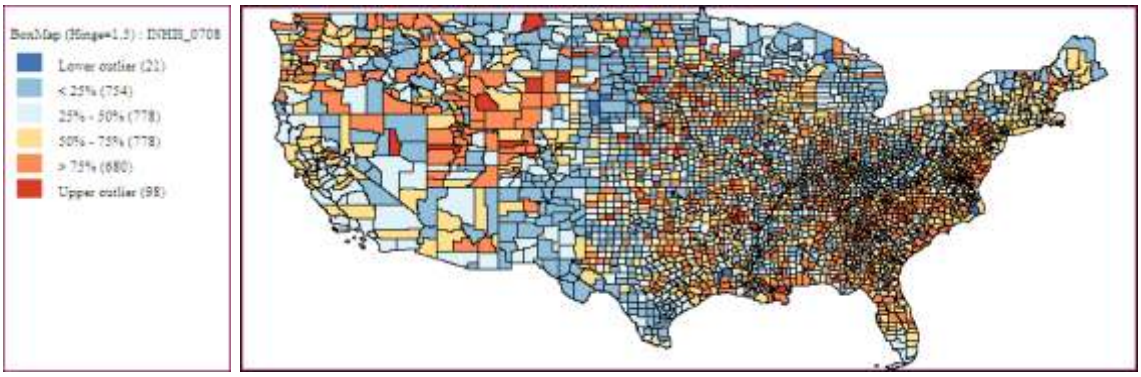
Panel chart 3 shows migration dynamics evolution for periods 2000-2007 and 2007-2008. The first period displays a process of dispersion, and it is clear that high dynamic counties reduced their number, if compared with the 1990-2000 period,from 313 to only 208. Finally, 2007-2008 period shows the emergence of a new dynamic area that corresponds to counties in the states of Colorado, Wyoming, Idaho and Utah, their consolidation as a new destinations depends on whether they are able to maintain their high dynamism to attract migrants.

Panel Chart 3. Box-Map analysis

(A) 2000-2007



(B) 2007-2008

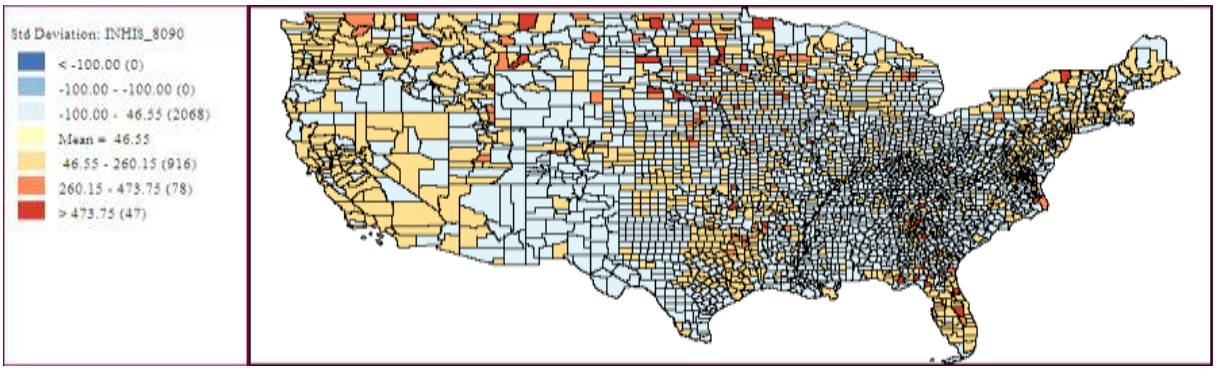


Source: Autor`s Calculations base on U.S Census Bureau (2009)

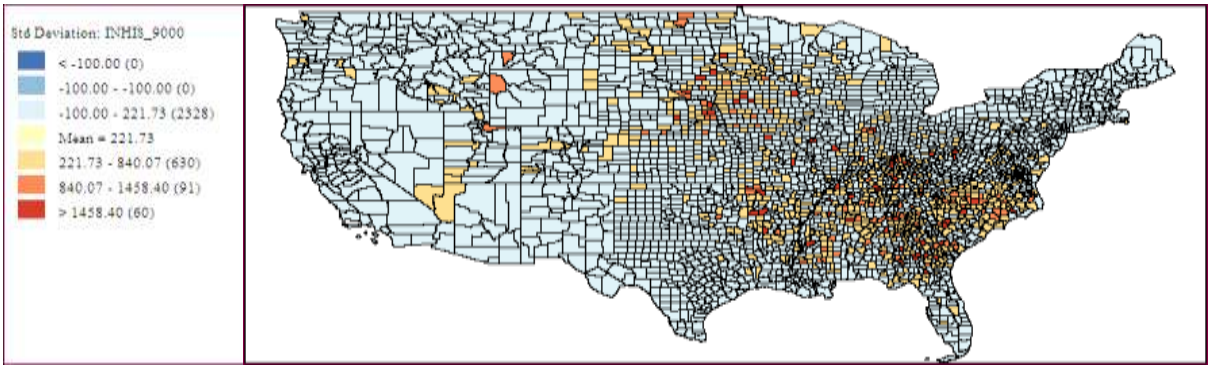
Finally, panel chart 4 provides standard deviation analysis of the growth rates showing evidence that hispanic migration above the mean values were located at the old destinations from 1980 to 1990, while in recent periods these above growth rates were located in the new destinations states.

Panel Chart 4. Standard Deviation Analysis.

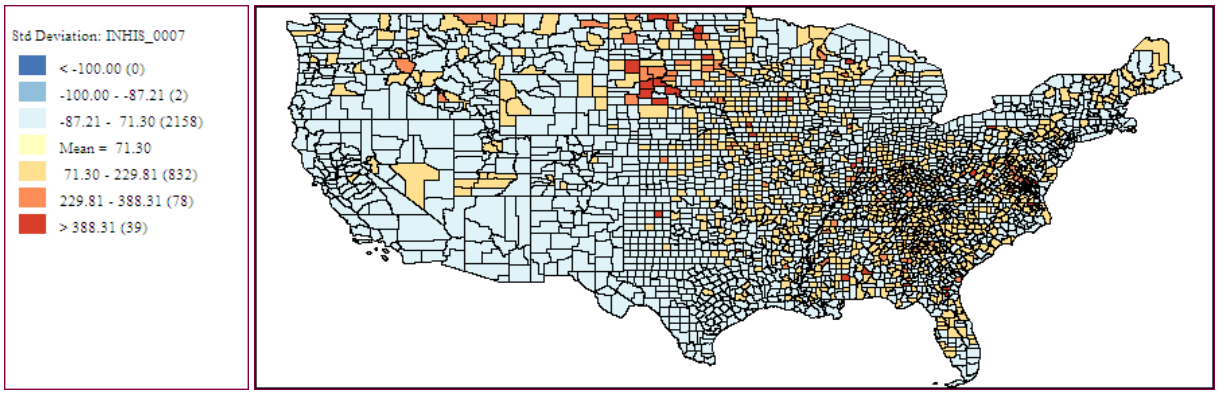
(A) 1980 -1990



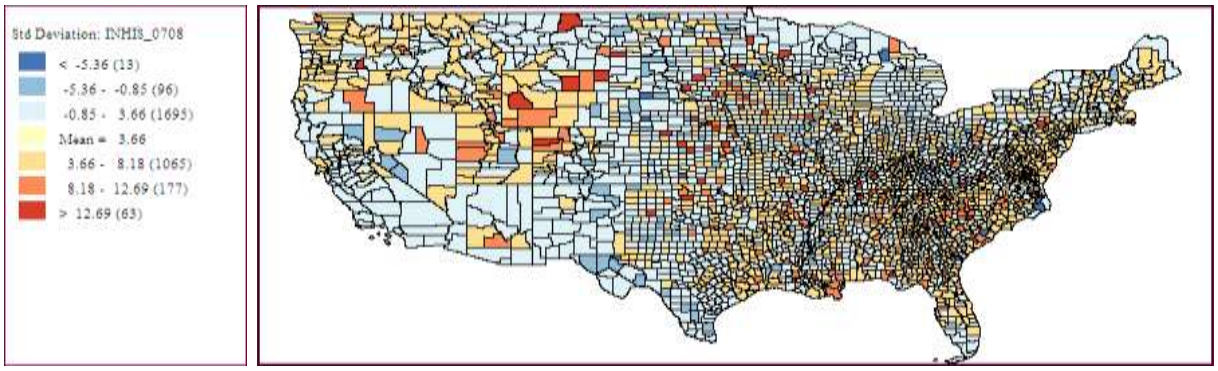
(B) 1990-2000



(C) 2007-2007



(D) 2007-2008



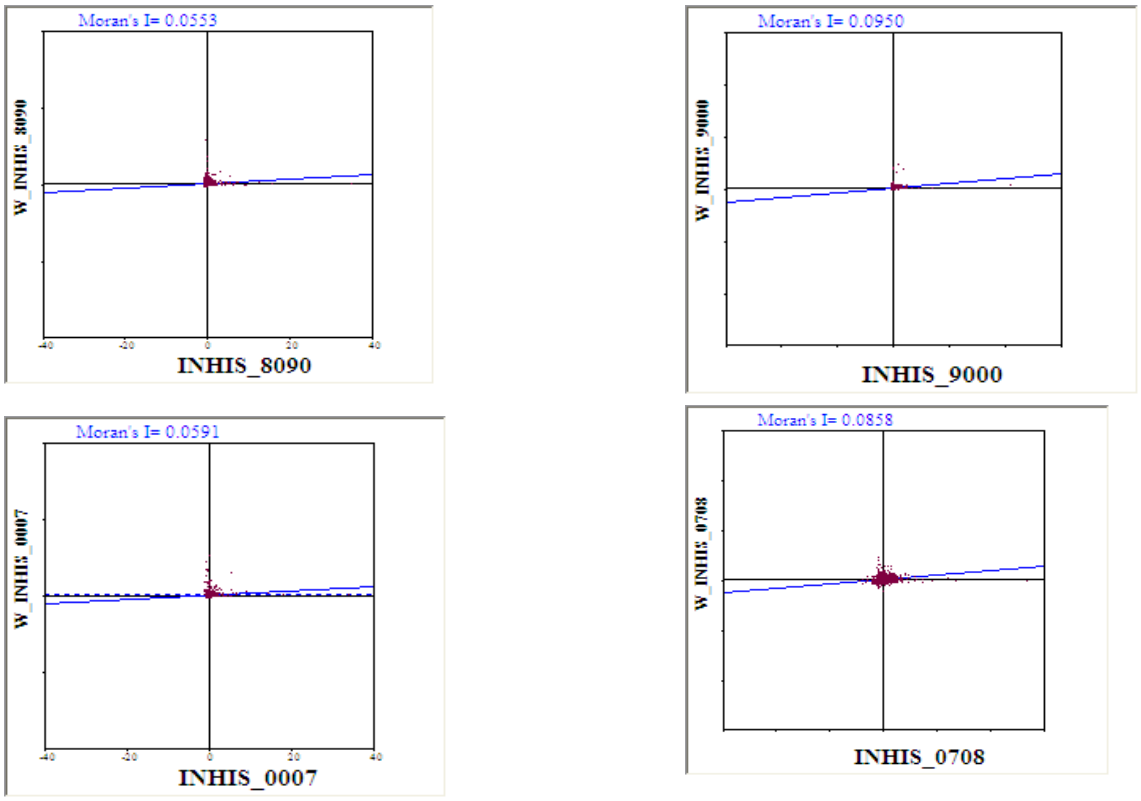
Source: Autor`s Calculations base on U.S Census Bureau (2009)

The formation process of new migratory destinations is not transitory, because the pattern continued during the nineties, and it also maintained the spatial association. We can see this trough the prevalence of counties that exhinit with geographic proximity and they are clustered in highly dynamic regions. To demonstrate the existence of this pattern of spatial dependence, it is used the Moran's index as a global measurement of spatial autocorrelation.[5]

[5] Moran`s index is a spatial autocorrelation indicator and is defined as $I = \frac{N}{S_0} \frac{\sum_{ij} w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^{N}(x_i - \bar{x})^2}$ where x_i is a quantitative variable x in region *i*, $\bar{X}$ is their sample average, **W** is a matrix with weights w_{ij}, *N* is a sample size and $S_0 = \sum_i \sum_j w_{ij}$.

Moran`s index in panel chart 5 indicates that spatial dependence is positive, which shows that counties with high migration dynamics are surrounded by counties with high migration dynamics and vice versa (low dynamic counties are surrounded by counties with low dynamics). Although the index is relatively small, it is statistically significant according to permutation tests . Comparison between periods shows that the spatial dependence increases from the first period (1980-1990) to the second (1990-2000) which is when the new migratory destinations emerge. This spatial fact suggest thateconomic spillovers could operate as attractors of migration labor force.

Panel Chart 5. Spatial Dependence: Moran`s Index.



Source: Autor`s Calculations base on U.S Census Bureau (2009)

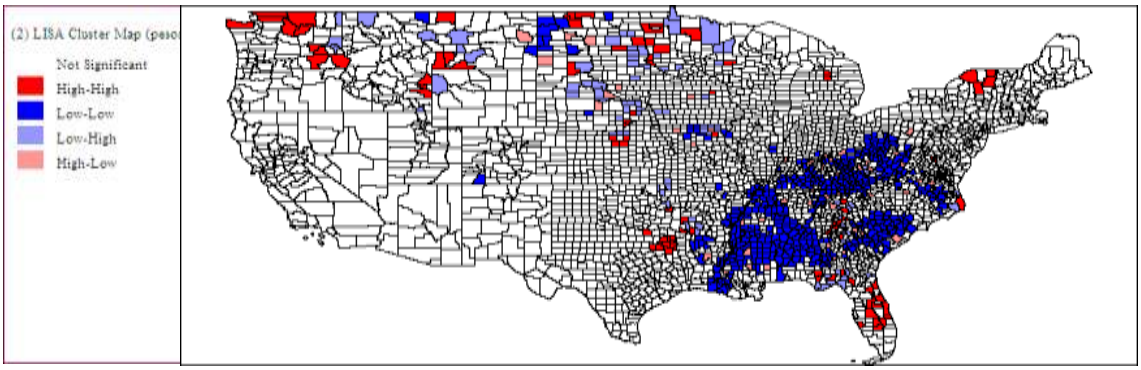
Analysis based on Moran`s index has disadvantages because it is a global indicator of spatial autocorrelation. Therefore, it would be adequate to carry out a local spatial correlation analysis known as LISA[6] which allows indentify groups of spatial

[6] For a detailed explanaion of LISA see Anselin (1988 and 2005). An introductory explanation is showed in Quintana and Mendoza (2008).

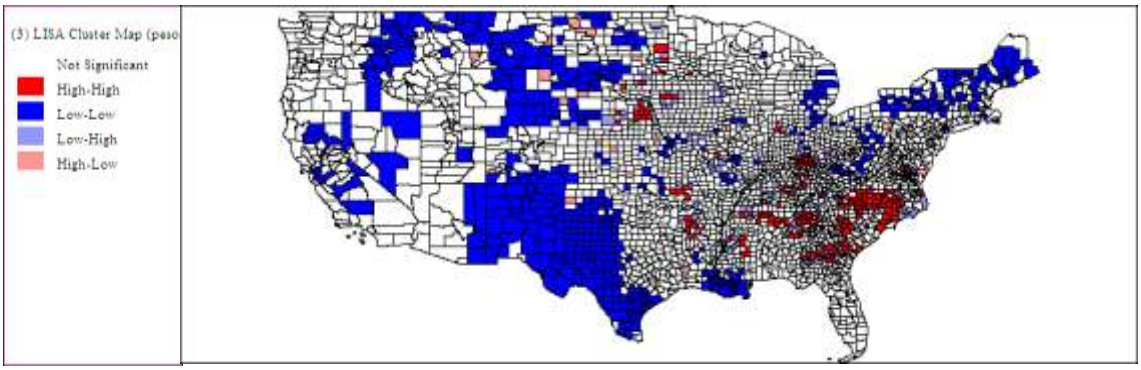
association at county level counties, these groups could suggest regions of new migration.Panel chart 6 shows that in 1980-1990 period, Florida´s counties and counties of Washington and Oregon kept high growth dynamics and they formed growth regions. While in the same period, counties of West Virginia, Kentucky, Alabama, Mississippi, South Carolina and North Carolina formed a migration region with low dynamic.However, facts change drastically from 1990 to 2000, on the Florida´s north region, where counties of the states of Virginia, Alabama, North Carolina and South Carolina started to display significant spatial local autocorrelation of highly dynamic counties. In contrast, counties of states considered as old migration destinations generated a a spatial association pattern with low migration dynamics. The last map on panel chart 6 indicates that old migration destinations kept their low dynamic in 2007-2007, but a new spatial cluster of counties with high migratory dynamic emerge in where states of Wyoming and Colorado are included. Also counties of North Carolina, South Carolina, Virginia and Maryland, show high migratory dynamics in both periods.

Panel Chart 6. Local Spatial Dependence: LISA Index.

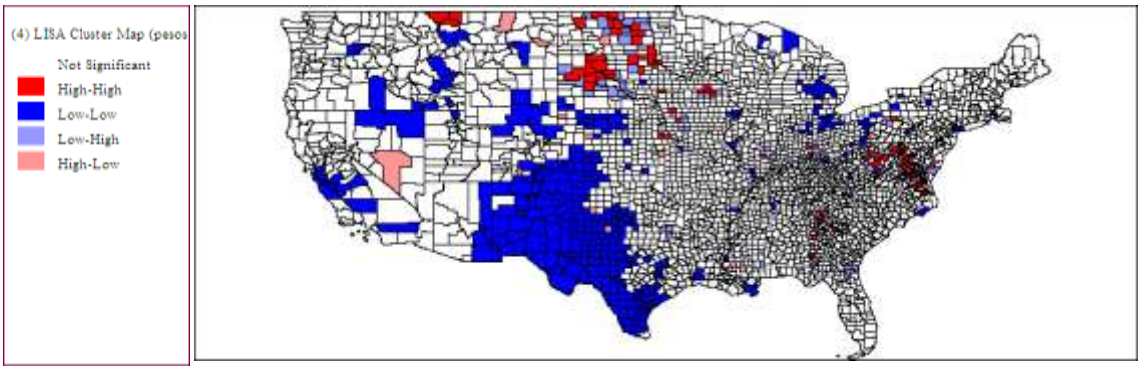
(A) 1980-1990



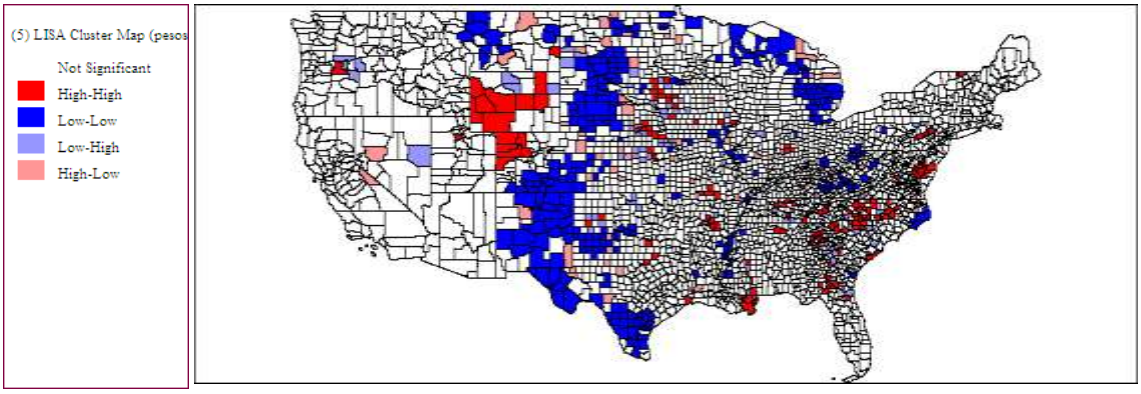
(B) 1990-2000



(C) 2000-2007



(D) 2007-2008



Source: Autor`s Calculations base on U.S Census Bureau (2009)

3. New migration destinations and agglomeration economies: An empirical NEG approach .

We postulate that spatial patterns of migration flows is caused by agglomeration economies. , NEG offers an analytic approach which is useful to model migrants localization and migration choice based on increasing returns and imperfect competition assumptions (Krugman 1991). In particular, we rely on Crozet´s proposal (2004) proposal, that is based based on NEG, to understand migration dynamics of Hispanics to the new destinations.The model.

3.1.1 Production and Consumption.

Market consists of R regions endowed by two factors, labor and free mobility labor. Each region produces three goods; a traditional and homogeneous good (z), non-tradable services (y) and manufactured goods (x). Good z is assumed homogeneous and produced under perfect competition, which is transported with high costs between regions and labor is not mobile. Price of good z and worker´s wage are similar in any place. Setting z as numerary, such that $p_z = 1$ in any region.Manufacturing and services goods are produced in monopolistic industries and labor free mobility is used to produce horizontally differentiated varieties. Each variety is produced under scale economies. Within each industry (x, y), the required labor to produce a q quantity is respectively; $\beta_x q_x + \varepsilon_x$ y $\beta_y q_y + \varepsilon_y$, where β_x y β_y are marginal inputs requirements to production, while ε_x and ε_y are fixed inputs requirements. If $n_{xi,t}$ y $n_{yi,t}$ denote the number of goods varieties x, y, produced in region i on period t, the sectoral employment of region i on period t is:

$$L_{i,t}^{x} = n_{xi,t}\left(\beta_x q_{xi,t} + \varepsilon_x\right) \text{ and } L_{i,t}^{y} = n_{yi,t}\left(\beta_y q_{yi,t} + \varepsilon_y\right) \qquad \forall i \in [i, R) \qquad (1)$$

Denoting $L_{i,t}$ as total of free mobility workers total in region i on period t, so $L_{i,t} = L_{i,t}^{x} + L_{i,t}^{y}$.

On the other hand, consumers are identical and maximize their utility through consumption of every good, with preferences type Cobb-Douglas in region i on period t:

$$U_{i,t} = C_{yi,t}^{\phi} C_{xi,t}^{\mu} C_{zi,t}^{1-\phi-\mu} \qquad \forall i \in [i, R) \qquad (2)$$

Where ϕ, μ y $(1-\phi-\mu)$ are consumption share in manufacture, services and traditional goods, respectively. $C_{zi,t}$ is the amount consumed in region i on period t. $C_{xi,t}$ is a compound good which shows manufactured goods variety and it is expressed as follows;

$$C_{xi,t} = \left(\sum_{m \in n_{xi,t}} c(m)_{xi,t}^{(\sigma_x - 1/\ \sigma_x)} \right)^{\sigma_x/(\sigma_x - 1)} \qquad \forall i \in [i, R) \qquad (3)$$

Where σ_x denotes substitution elasticity between varieties, $c(m)_{xi,t}$ is consumed quantity of variety m in region i on period t and $n_{x,t}$ is the number of varieties available in the economy $\left(n_{x,t}=\sum_{i\in R} n_{xi,t}\right)$. Consumers cannot import services goods varieties from other region, therefore, available varieties number of good y in region i is the variety number produced within region $\left(n_{yi,t}\right)$, and $C_{yi,t}$ is:

$$C_{yi,t}=\left(\sum_{m\in n_{yi,t}} c(m')_{yi,t}^{(\sigma_y-1/\ \sigma_y)}\right)^{\sigma_y/(\sigma_y-1)} \qquad \forall i\in[i,R) \qquad (4)$$

As it is usual in this framework, each producer has the same price that maximizes benefits , price is a constant mark-up over marginal cost. Letting $w_{i,t}$ to be workers wage with free mobility in region i on period t, *fob* price (for over board) of a produced variety in region i is:

$$p_{xi,t}=\frac{\sigma_x}{\sigma_x-1}\beta_x w_{i,t} \quad \text{and} \quad p_{yi,t}=\frac{\sigma_y}{\sigma_y-1}\beta_y w_{i,t} \qquad \forall i\in[i,R) \qquad (5)$$

However, free entry in each sector leads to zero profits in equilibrium. Furthermore, using (1) and (5) equations and equilibirum condition in each regional labor market, would obtained enterprises number in each region:

$$n_{xi,t}=\frac{L_{i,t}^{x}}{\varepsilon_X\sigma_X} \quad \text{and} \quad n_{yi,t}=\frac{L_{i,t}^{y}}{\varepsilon_y\sigma_y} \qquad \forall i\in[i,R) \qquad (6)$$

Finally, assuming transportation costs transport of iceberg type in manufactured goods, shipment between regions and assuming that a fraction good $(\tau_{ij}-1)/\tau_{ij}$ "melts" in the transportation so $\tau_{ij}>1$ good`s units have to be transported from region i to deliver a unity in region j. Assuming that this transport costs (τ_{ij}) are a distance increasing function between two regions d_{ij}.

$$\tau_{ij} = Bd_{ij}^{\delta} \quad \forall i, j \in [i, R),\ \delta > 0 \text{ y } B > 0 \tag{7}$$

3.1.2 Market Potential Function

Traditional good price (z) is normalized to one, such that real wage of mobility workers in region i is:

$$\omega_{i,t} = \frac{w_{i,t}}{P_{yi,t}^{\phi} P_{xi,t}^{\mu}} \tag{8}$$

Where $P_{xi,t}$ and $P_{yi,t}$ are CES type prices index of industrial and services goods aggregate, respectively, in region i:

$$P_{xi,t} = \left[\sum_{r \in R} \left(\sum_{m \in n_{xr,t}} \left(\tau_{ir} p_{xr,t} \right)^{1-\sigma_x} \right) \right]^{1/(1-\sigma_x)} = \left[\sum_{r \in R} n_{xr,t} \left(Bd_{ir}^{\delta} p_{xr,t} \right)^{1-\sigma_x} \right]^{1/(1-\sigma_x)} \tag{9}$$

$$P_{yi,t} = \left(\sum_{m' \in n_{i,t}} p_{yi,t}^{1-\sigma_y} \right)^{1/(1-\sigma_y)} = n_{yi,t}^{1/(1-\sigma_y)} p_{yi,t} \tag{10}$$

It is clear in (9) that price index of manufactured goods, can be treated as the inverse of market potential function: this shows a comparable sum of the market sizes in every regions weighted by their distances. Furthermore, an interpretation would establish that price index is greater in distant regions where consumers should import a great proportion of their demand from remote locations. Similarly, with a constant nominal wage, so that workers real income is lower in regions that offer a relatively small number of service varieties. This price index effect with a high density in services and a access market low costs makes such sites more attractive places to live. This is the forward linkage of Hirschman type that contributes to the cumulative process of spatial agglomeration.

3.1.3 Migration Choice

Migration Model follows Tabuchi y Thisse (2002). Considering a free mobility worker k, that choices her localization from region j to any of the R regions, including

region j. The migration choice is a result of quality of life comparison between several sites. For empirical convenience, it is assumed that migration choice is made through maximization of the following function:

$$\pi_{ji,t}^{k} = V_{ji,t}^{k} + \varepsilon_{i}^{k} = \ln\left[\omega_{i,t}\rho_{i,t-1}\left[d_{ij}\left(1+bF_{ij}\right)\right]^{-\lambda}\right] + \in_{i}^{k} \qquad (11)$$

Where $\rho_{i,t}$ is likelihood of find a job for a migrant in region i on period t and $\left[d_{ij}\left(1+bF_{ij}\right)\right]^{-\lambda}$ is a migration cost which increases with distance between home and destination places. λ y b are strictly positive coeficients, and F_{ij} is a dummy variable that indicates if regions i and j do not share a common border. $\in_{i}^{k}$ is a stochastic component that captures $k`s$ personal perceptions of region i characteristics. To avoid endogeneity problems in the empirical implementation, it is assumed that migration choices on period t are determinate by π_{ji}^{k} comparison between regions on period $t-1$. Furthermore, individual k would decide to move to in region i if $V_{ji,t-1}^{k} > V_{jr,t-1}^{k}$, $\forall r \neq i$. With convenient assumption made about distribution of $\in_{i}^{k}$, the likelihood of choice region i is determinate by the logit function:

$$P\left(M_{ji,t}\right) = e^{V_{ji,t-1}^{k}} \Big/ \sum_{r\in R} e^{V_{jr,t-1}^{k}} \qquad (12)$$

Expected migration flow from region j to region i is $L_{j,t}P\left(M_{ji,t}\right)$. Similarly, emmigration total flow of region j is $L_{j,t}\left[1-P\left(M_{jj,t}\right)\right]$. The migrants share of region j who choose go to region i is:

$$\frac{migr_{ji,t}}{\sum_{i'\neq j} migr_{ji',t}} = \frac{e^{V_{ji,t-1}^{k}}}{\sum_{r\in R} e^{V_{jr,t-1}^{k}} - e^{V_{jj,t-1}^{k}}}$$

Using (5), (6), (8), (9), (10) equations and definition of $V_{ji,t}^{k}$, migrant share of region j that choose region i, may write as;

$$\ln\left(\frac{migr_{ji,t}}{\sum_{i'\neq j} migr_{ji',t}}\right) = \ln\left[\left(L^{y}_{i,t-1}\right)^{\phi/(\sigma_y-1)}\right] + \ln\left[\left(\sum_{r\in R} L^{x}_{r,t-1}\left(w_{rt-1}d^{\delta}_{ij}\right)^{1-\sigma_x}\right)^{\mu/(\sigma_x-1)}\right] \quad (13)$$
$$+ \ln\left[w^{1-\phi}_{i,t-1}\rho_{i,t-1}\right] + \ln\left[d_{ij}\left(1+bF_{ij}\right)\right]^{-\lambda} + \tilde{\alpha}_{j,t-1}$$

with $\tilde{\alpha}_{j,t-1} = -\ln\left(\sum_{r\in R} e^{V^{k}_{jr,t-1}} - e^{V^{k}_{jj,t-1}}\right)$

Equation (13) captures the valuation faced by potential migrants who have to choose between several possible locations. Left side of equation (13) is the migrants share from a given region who have decided move to region i. On the right side, third term represents expected wage on region, which increases with nominal wage on home region and a likelihood of find a job in this region. Fourth term captures the impact of bilateral distance of migration flows and it is interpreted as a displacement average cost. First two terms denotes access market of $i`s$ regions, which are; price index to varieties of non-tradable services goods and to manufactured goods in region i, respectively. Second term in equation (13) in the most important term, because corresponds to a market potential function and relates labor migration with industrial activities localization, and would suggest forward linkages highlighted by NEG. On the other hand, main parameters of the NEG framework (substitution elasticity and parameters of trade cost function) can be estimated from price index function. Furthermore, if empirical analysis confirms that this price index encourages migration flows, i.e. migrants follows market potential, validates the role of forward linkages as a part of endogenous agglomeration process.

4. Access Market Effect on the configuration of new migration destinations. A simple model from spatial econometrics.

ESDA analysis is only exploratory, furthermore confirmatory analysis requires a formulation based on spatial econometric models. When spatial dependence of data is

confirmed, is necessary specify a spatial regression model that take into account dependence. The general model proposed is:

$$y = \rho W_1 y + X\beta + \varepsilon$$
$$\varepsilon = \lambda W_2 \varepsilon + \mu \qquad (14)$$

with μ~N(0,Ω) being diagonal elements of $\Omega_{ii}=h_i(z\alpha)$ with $h_i>0$

where **y** is a endogenous variable vector, **X** is a exogenous variables matrix and ε is the error term that incorporates an autoregressive spatial dependence structure, W_1 y W_2 are spatial weights matrix.[7]

The explanation of migratory process based on NEG approach, as discussed in the last section, and the existence of spatial effects, leads to assume the number of Hispanic migrants in the United States depends on some extent of the economic activity concentration and dispersion variables across counties and their spatial characteristics In the last section, we presented a formal model of NEG model that incorporates agglomeration economies to explain space distribution of labor migration. (Crozet 2004). The model postulates that labor migration is not only determinate by real wage differential, but also by other factors like mobility costs and risks associated to migration. The hypothesis raised here is that a great market potential induce labor factor flows.

Spatial dependence of data showed in ESDA, see section 2, suggest possible interaction effects of sites attributes in the migratory process explanation. Explanation of migratory process based on NEG approach and these spatial effects, may assume that migration growth rates depends on economic activity concentration and spatial characteristics of the regions.

To consider both elements in an econometric implementation, we proposed the following spatial model *a la* Crozet (2004):

$$TMigr_{it} = \rho W_1 TMigr_{it} + \beta_1 TIPR_{it} + \varepsilon_{it} \qquad (15)$$

[7] See about Quintana and Mendoza (2008) for an introductory explanation to spatial weights matrix.

$$\varepsilon_{it} = \lambda W_2 \varepsilon_{it} + \mu_{it}$$

where: $TMig_{it}$ is the migration growth rate of hispanics in county i on period t, $TIPR_{it}$ is the growth rate of real personal income in county i on period t. The latest variable is considered a centripetal force to take into account market access effect, which is a market size, as it is proposed by NEG.The specified equation is estimated to periods 1980-1990, 1990-2000 y 2000-2007. The results are shown in table 1 from which it follows that in each period the growth rate of real personal income is a variable that impacts positive and significantly to migration growth rate. Comparison between periods showed that access market effect is reinforced considerably in 1990-2000 period, where a percentage point of growth in income translates into 1.7 points of growth in the rate of migration, whereas in previous period corresponding to domain of traditional migration destinations income differential has an impact of only 0.8%. Results for the last period show a lower impact of market effect with a coefficient of only 0.51, situation that could indicate the presence of dispersion effects in the new migratory destinations, which somehow we have observed with the creation of new migration counties in that period.

Table 1

Estimation for Different Periods

Period	Constant	TIPR	Spatial Effect Type
1980-1990	26.650	0.804	LAG
p-valor	0.000	0.000	
1990-2000	172.030	1.700	LAG
p-valor	0.000	0.000	
2000-2007	65.410	0.510	SARMA
p-valor	0.000	0.020	

Source: Autors`s Calculations based on U.S Census Bureau (2009) and County Business Patterns (2009)

In all cases, the spatial effects test indicates spatial models as alternatives, dominating in the two firsts periods a spatial lag model. Results of spatial models estimation are shown in table 2. Market access effect, i.e. the growth rate of real personal income, remain are similar to the estimations without spatial effects in table 1; however, spatial effects are significant and explain 0.13% of migration growth in 1980-1990 and 2000-2007 periods. , In the period where new destinations had greater growth, spatial

effect is bigger (the coefficient had a value of 0.23%). Aragones (2006) argues that in the new migration destinations, social networks are not the main factor to attract migrants, however spatial effect detected during 1990-2000 period can be a a spillover effect that influence migration among counties.

Table 2

Estimation for Different Periods

Period	Constant	TIPR	Spatial Effect Type
1980-1990	26.650	0.804	LAG
p-valor	0.000	0.000	
1990-2000	172.030	1.700	LAG
p-valor	0.000	0.000	
2000-2007	65.410	0.510	SARMA
p-valor	0.000	0.020	

Source: Autors`s Calculations based on U.S Census Bureau (2009) and County Business Patterns (2009)

5. Final Considerations.

This paper provides a review of the literature on migration from economic discipline as well some stylized facts about spatial configuration of Hispanic migration in USA. We proposed that these spatial patterns can be explained through agglomeration economies.

Agglomeration economies studied from economic geography suggest that they are casued by economies of localization and urbanization . We see in this paper that the center-periphery model of the New Economic Geography which assumes increasing returns and imperfect markets provides an interesting approach to model migratory flows in the context of agglomeration economies.as proposed by Crozet (2004) In this paper, we estimate a simple model based on spatial econometrics based which is a "spatial version" of Crozet´s model (2004) that helps to understand the determinants of new migrant destinations of Hispanics in the United States. Our results show that the 1990-2000 period was subject to strong geographical-spatial reconfiguration of the flows patterns of migration leading to the emergence of new destinations. During the period 2000-2007, we find evidence of a process of dispersal toward new counties that attract

immigration. We conclude that during the concentration period 1990-2000, the impact of market access (demand) on the attraction of migration was relatively higher if compared with the dispersal periods (1980-1990 in the old places and 2000-2007 with the emergence of new migratory regions).

Likewise, we detect that spatial effects of contagion in migratory processes are significant, which provides further evidence that spatial aspects of the new counties (suc as geographical location, productive linkages, economic spillovers) are acontributing factors to the growth of migration.

The results shown in this study are preliminary because are based on a simplified model, therefore this study should be extended to estimate the equation with all the determinants that arising from a complete NGE model. In addition, we believe that this study must incoporate urbanization economies type factors (such as amenities) to test whether the determinants of agglomeration economies are indeed relevant to explain the spatial distribution of the new Hispanic migrant destinations in the United States. Patrigde (2010) argue that in the case of the United States, agglomeration economies attributed to amenities, are more predictive than the proposals from the NGE. It remains for further research to explore these issues.

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