

Intra-Urban Patterns of Immigrant Location and the Housing Market: A Preliminary Investigation

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EURODIV PAPER 42.2007

DECEMBER 2007

KTHC - Knowledge, Technology, Human Capital

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This batch of papers has been presented at the Third Conference “Diversity in cities: Visible and invisible walls”

Intra-Urban Patterns of Immigrant Location and the Housing Market: A Preliminary Investigation

Summary

Over the last few decades the developed world has seen a substantial influx of immigrant population giving rise to a number of studies examining the social, economic and spatial implications immigration has for the countries. However, despite the growing research interest, there are still many questions which require closer investigation. To start with, existing research has focused its analysis on the metropolitan areas whereas other cities have not been taken under examination. Moreover, studies have placed emphasis on identifying the intra-metropolitan locational preferences of immigrants disregarding the effects these might have on the urban structures and the urban housing markets. The current study comes to shed light in these areas. First it explores the intra-urban locational preferences of immigrants in one (out of four in total) medium-sized Greek city, the city of Volos, to consider whether segregation of immigrant population is evident. Second, drawing on urban and property economics, the study develops a theoretical framework that enables to assess the impact these locational decisions might have on the residential structure of neighbourhoods and the urban housing market.

Keywords: Immigration, Segregation, Intra-Urban Structure, Housing Market

JEL Classification: J15, R14, R2, R21

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1. Introduction

International immigration has grown considerably over the years. Today, many countries are affected by the migration process and the outcomes are complex, diverse and interlinked. Greece has seen a substantial influx of immigrant population over the last fifteen years or so. Currently, according to official estimates, there are about a million foreign people living in the country, compared to about fifty thousands in 1991, of which the vast majority (over 60%) are economic immigrants from Albania.

This phenomenon has attracted increasing attention, giving rise to a few studies examining the social, economic and spatial implications immigration has for the country. As regards its spatial impact, the general trend reported is immigrants to move primarily into the metropolitan areas, which offer substantial employment opportunities. As regards the intra-urban location pattern, studies indicate that the new comers tend to concentrate in areas where their co-ethnics reside and where low-cost housing can be found.

Although this literature has addressed a number of key research questions, there are still many which require closer investigation. To start with, existing research has focused its analysis on the metropolitan areas of Athens and Thessaloniki whereas other primary cities have not taken under consideration. Moreover, studies have placed emphasis on identifying the intra-metropolitan locational preferences of immigrants disregarding the effects these might have on the urban structures and the housing markets.

The current study comes to fill in these two gaps. First it explores the intra-urban locational preferences of these new urban dwellers in one (out of four in total) medium-sized city, the city of Volos, to consider whether segregation of immigrant population is evident. Second, drawing on urban and property economics, it develops a theoretical framework that enables to assess the impact these locational decisions might have on the residential structure of the cities and their housing markets.

In doing so, the paper is structured as follows. The next section outlines the theoretical models that have been developed to explain immigrants' spatial behaviour,

whereas the following one reviews the relevant literature to delineate the international experience on the issue. Section Four examines the effect immigration may have on the housing market. Section Five assesses the impact of immigration on, and the experience gained by, the two Greek metropolises. In turn, section Six explores the situation and discusses the findings of the Volos case study. Section Seven outlines the theoretical framework that this research puts forward to explain the residential distribution of immigrants at an intra-urban level and the impact of immigration on the housing market. Finally, section Eight concludes the paper summarising the key findings.

2. The spatial behaviour of immigrants: conceptual considerations

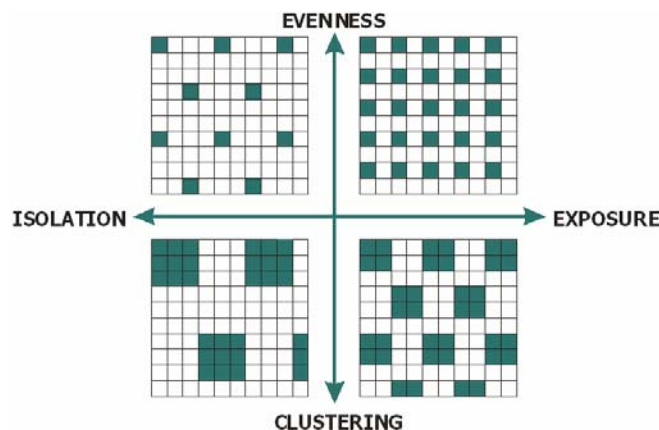
The processes at which different groups of people occupy different social environments and the spatial patterns that result from such processes have been extensively discussed in the literature under the theme of *segregation*. Initial approaches of segregation dealt with space implicitly, equating the social environment with some organizational unit that has a spatial substance (e.g. a district, a neighbourhood, a school, etc). These essentially ‘aspatial’ treatments have been repeatedly criticized, especially for their inability to account for the spatial patterning of these units in social space (Openshaw and Taylor, 1979; White, 1983; Massey and Denton, 1988; Morrill, 1991; Wong, 1993, 1997, 2002; Reardon and O’Sullivan, 2004).

This urged some researchers (notably Massey and Denton, 1988) to develop approaches that take into explicit account the spatial character of residential segregation. In this context, notions available from the economics literature, such as clustering, concentration and centralization, have been utilised to assess segregation. In particular, they identified five separate dimensions to the segregation of any one group: the *unevenness* of its residential distribution, its *isolation* from other groups in the area, its *clustering* into ghetto-like areas, its *concentration* into high density districts and its relative *centralization* within the urban fabric. In Massey and Denton’s formulation, evenness and exposure are aspatial dimensions (allowing that they are nonetheless implicitly spatial because they depend on census tract

boundaries), while clustering, concentration, and centralization are explicitly spatial dimensions of segregation.

More recently, other scholars (Reardon and O’Sullivan, 2004) have elaborated on the above approaches to develop more refined measures of spatial segregation that analyse patterning along two axes: one indicating spatial exposure (or spatial isolation) and the other indicating spatial evenness (or spatial clustering) (see Figure 1). Spatial exposure refers to the extent that people belonging to one group are mixed with people of other groups (or remain spatially isolated) in their local spatial environments. Spatial evenness assesses the distribution of a group in the residential space, specifying the extent at which its members prefer to locate close to each other (i.e. to cluster together). The combination of the two analytical concepts gives four patterns of residential location, as shown in Figure 1. The upper half of the diagram presents two patterns of evenly distributed (‘green’ and ‘white’) households, indicating low levels of spatial clustering (or high levels of spatial evenness). The difference between the two is on the degree of exposure they go through. People of the two groups in the upper-right pattern are equally mixed with each other, whereas in the upper-left quadrant ‘green’ households are more isolated. In turn, both patterns at the bottom half of the Figure indicate high degrees of clustering: the right one presents a ‘green’ community with higher exposure, whereas at the left one higher degrees of isolation are evident.

Figure 1: Dimensions of spatial segregation



Source: Based on Reardon and O’Sullivan (2004)

Turning to the reasons behind the development of the various patterns of residential segregation, two sets of explanation have been put forward: cultural and economic.

Cultural explanations argue that immigrants tend to locate close to each other in order to take advantage of their closely-integrated social networks and to retain valued elements of their cultural heritage, such as language and religion (Boal, 1976; Hugo, 1996; Dunn, 1998). Economic explanations draw attention to the functioning of both the labour and the housing markets, asserting that newcomers are compelled to cluster in the least expensive parts of the city due to income and information limitations (Massey, 1985; Boal 1986; Kempen and Ozuekren, 1998). These arise, first, because immigrants are usually low-skilled, low-paid, unemployment-prone workers (Tripier, 1990; Ulrich, 1994), and, second because they are faced with both restricted access to mortgage finance and increased information deficiencies with regard to the institutional mechanisms of the host society (Kesteloot, 1995; Petsimeris, 1995; Pacione, 1996). It is important to mention that economic explanations see intra-urban low-priced housing as the cause behind spatial clustering of immigrants, whereas for cultural explanations low-priced houses can be a side-effect caused by the decrease of desirability of the particular location to other groups of inhabitants.

In order to analyse the processes of spatial settlement of immigrants three fully fledged, explanatory models have been developed (Freeman, 2000). These are the *spatial assimilation* model, the *spatial stratification* model and the *residential preference* model, which are discussed next.

The spatial assimilation model, developed by the Chicago School of human ecology, argues for the time-progressive dispersal of initially spatial-concentrated immigrant groups (Dunn, 1998). Concentration is rooted in the cultural character of immigration but is reinforced by economic considerations that affect the immigration process. It is expected that over the initial stages of immigration newcomers would cluster together in order to take advantage of the social and kinship networks of their coethnics. These networks provide social support, information as well as employment opportunities. However, as time goes by, the gradual acquisition of the language, values, and manners of the host society (a process called *acculturation*), achieved through prolonged contact with natives and through mass institutions such as schools and the media, would lead to the spatial assimilation of the immigrants (Freeman, 2000). This is because, as the degree of acculturation increases and the immigrants' socioeconomic status rises, the social distance between natives and immigrants

diminishes, leading to a decrease of the spatial distances between them (Hawley, 1950; Park, 1926). Thus, immigrants move out of the poor inner-city areas to the outer suburbs starting to integrate spatially with the natives (Massey, 1985; Kempen and Ozuekren, 1998).

Although the spatial assimilation model describes relatively well the progress of spatial settlement for most immigrant groups, e.g. the non-English speaking populations in Sydney and Melbourne in Australia (Grimes, 1993; Hugo, 1996) and the black Caribbeans in Greater London (Peach, 1996), it encounters serious problems in explaining the spatial patterns of minorities with African heritage, namely African Americans and Puerto Ricans (Freeman, 2000). This has led to the development of the place stratification model.

The place stratification model considers urban space as a hierarchy of places ordered in terms of desirability and the quality of life they provide to urban dwellers (Logan, 1978). Natives occupy the most desirable places, keeping immigrants, and generally ethnic and racial minorities, at a distance. This situation reflects natives' perception of immigrants' place in the society. Immigrants are attached a low social status and remain segregated, even if they are financially able to take up residence in areas occupied by natives (Alba and Logan, 1993; Freeman, 2000). The place hierarchy is maintained through both institutional mechanisms (redlining, exclusionary zoning, etc.) and discriminatory acts on the part of the host society (policing, violence against minorities, etc.). In the case of hierarchy disturbance, natives are expected to depart out of the 'invaded' area in a progressive manner, leaving immigrants to constitute, slowly but steadily, the majority population in the area.

While the place stratification model envisages spatial segregation to be imposed on immigrants (by other urban groups), the residential preference model asserts that this is in fact a decision of the immigrants themselves. That is, members of the immigrant group 'prefer' to reside with their co-ethnics and to remain spatially segregated, even when they have the financial means or the social status that would enable them to move elsewhere (Freeman, 2000). There are many benefits to be gained due to such spatial behaviour. To newcomers, the community's social network would provide not only emotional, social and cultural support, but also other vital 'resources', such as

housing and valuable information (on the host institutional framework and the labour market) (Hagan, 1998). To all other members, the community represents the stronghold of their own cultural identity (in a sense it constitutes a specific ethnic local public good). It enables them to sustain aspects of their pre-migration cultural practices (religion, language, etc.) while also facilitating their assimilation into wider society. This element constitutes the key difference between the residential preference model and the spatial assimilation model; that is, there is no acculturation process envisaged in the former.

3. Some international evidence on the spatial behaviour of immigrants

What becomes apparent from the above discussion is that immigrants' intra-urban location decisions are determined by both cultural and economic factors. When cultural reasons prevail over economic ones, immigrant concentration is expected to be strong and sustained in the long-run. In contrast, dominance of economic considerations over cultural ones would lead, in the long-run, to smoother residential patterns characterised by greater evenness. A number of studies have attempted to explore these issues in empirical research and to assess the role played by, and significance attached to, each set of determinants with regard to the developed urban residential structure.

In a study examining patterns of residential location among immigrants in Oslo, Blom (1999) supported the view that the most significant factor in determining immigrant's locational behaviour is economic resources; though cultural reasons also appear to play an important causal role. This is interpreted as an assimilation tendency where immigrants, after a certain length of stay, start to conform to local residential patterns. On these grounds dispersal of foreign-born inhabitants is observed after an initial period of concentrated immigrant housing. To a similar conclusion come Djuve and Hagen (1995) drawing on a survey research they conducted to a sample of 329 refugees in Oslo. They found that affordability of housing is the main reason behind the latter's decision to settle in a particular residential area within the city, rather than 'preferences for living close to countrymen'. Analogous evidences have provided also Zang and Hassan (1996), Lan-Hung and Jung-Chung (2005) and Burnley (2005) who

explored the residential preferences of immigrants in Australian metropolises. These studies indicated that while immigrant groups may prefer to settle in close proximity to their family and kin for practical and/or emotional reasons, their locational choice depends largely on income and housing affordability, availability of neighbourhood services and closeness to work, giving rise to more assimilated residential patterns.

In a recent study investigating immigration dynamics and resulting residential patterns in the four largest Dutch cities (i.e. Amsterdam, Rotterdam, The Hague and Utrecht) Bontje and Latten (2005) observe a strong exchange of population subgroups. Natives show an ongoing outflow from certain urban neighbourhoods, where foreign-born population is increasingly settling in. These neighbourhoods have formed the basis of immigrant communities that are growing fast through family reunification and family formation. In fact, in some areas the share of foreigners has reached “... levels above 70 per cent and even 80 per cent, in contrast to the national share of 10 per cent” (Bontje and Latten, 2005: 450). This can be seen as an example of joint implementation of economic and cultural factors, where economic reasons account for the initial stages of immigrant concentration, and cultural reasons justify its enhancement and longevity. Similar conclusions are drawn by Bolt *et al* (2002) who, on the basis of both income and ethnicity, predict further strengthening of segregation and concentration of immigrants in the Dutch cities. However, there are researchers (Deurloo and Musterd, 1998; Musterd and Deurloo, 2002) which assert that the observed patterns of immigrant’s residential concentration tend not to be stable and therefore spatial integration is to be seen.

The situation across the Atlantic appears to be more complex. Scholars, such as Freeman (2000), Johnston *et al* (2003) and Myers and Liu (2005), report a process of immigrant clustering in the American Metropolises similar to the one described above (i.e. fuelled by a time-lagged implementation of economic and cultural factors), but only for certain ethnic groups. Thus, it is argued that initially Asian and Latino immigrants were located in the degraded inner-city areas due to economic reasons, whereas subsequent newcomers of the same ethnic groups settle in the same neighbourhoods on the basis of cultural reasons. However, as they climb up the socioeconomic ladder they tend to move out and to assimilate into ‘white’ neighbourhoods. In contrast to Asian and Latino groups, the form of residential

patterning exhibited by African Americans is somewhat different, in both its character and intensity (Massey and Denton 1985, 1987; Harrison and Weinberg, 1992; Alba and Logan, 1993; Logan *et al* 1996; Clark and Ware, 1997; Denton and Massey, 1998; Freeman, 2000). This ethnic group seems to place greater emphasis on cultural factors and, on these grounds, to show more concentrated patterns of residential location.

A similar situation is seen in Lisbon. Malheiros and Vala (2004) distinguish between two groups of immigrants with different locational behaviour. African-origin immigrants are more 'consolidated' in their residential pattern, whereas all other groups (dominated by Eastern Europeans and Brazilians) temporarily settle within their co-ethnics to flee out when their socio-economic conditions improve. An interesting point that comes out of the Lisbon study is the role that the property market plays in this process. Malheiros (2000) argues that the housing market may be held responsible in this dual pattern of immigrant settlement, where Africans end up in degraded urban spaces of low-quality housing and non-Africans enjoy space and housing of better quality. Moreover, Malheiros (2000) asserts that the housing market not only influences, but is also determined by the locational behaviour of immigrants. The mass arrival of immigrants in the past decades brought a substantial increase in demand for low-cost houses, necessitating local authorities to respond with a policy of freezing property rents, tight controls over evictions and loose enforcement of legal procedures over illegal constructions.

Concluding this discussion it becomes clear that there exists no common pattern of immigrant residential location to be evident in the majority of places. Stated differently, economic and cultural factors influence at a different degree the locational choice and the residential patterns of immigrants, depending on the local conditions, policies and institutions, the cultural background of immigrants and the time that immigration takes place. It is on these grounds that Musterd *et al* (1997), having analysed immigrant residential behaviour in nine European metropolises, identifies the establishment of four spatial patterns: (a) clustering of immigrants in inner-city locations, (b) concentrations of immigrants outside central areas, (c) scattered immigrants but with clustering in inner-city locations, and (d) scattered immigrants but with concentrations in locations outside the city centre.

4. Immigration and the housing market

Although a substantial number of studies have explored the residential segregation of ethnic groups within cities, very few have examined the impact of immigration on the urban housing markets (see for instance Ley and Tutchener, 2001; Carter, 2005; Myers and Liu, 2005; Saiz, 2003a, 2003b, 2006; Saiz and Wachter, 2006; Moody, 2007). These studies have affirmed that immigrants tend to cluster in relatively few metropolitan areas and in specific neighbourhoods within cities where their co-ethnics reside, suggesting the existence of an intra-ethnic amenity premium for these locations. This, as discussed above, is due to cultural or/and economic reasons. While the former places emphasis on the intra-ethnic social and cultural amenities, the latter highlights the lower overall costs (including transaction costs) that immigrants benefit by locating in these areas.

Whatever the reason of the ethnic segregation, researchers agree that a positive relation between immigration and housing values exists, at least in the short run (Burnley and Murphy, 1994; Bourassa and Hendershott, 1995; Bourne, 1999; Ley and Tutchener, 2001; Saiz, 2003a, 2003b; Carter, 2005; Myers and Liu, 2005; Moody, 2007). Immigration pushes up the demand for housing in the destination cities or neighbourhoods, resulting in short-term inflation of house prices and rents, until the marginal immigrant is indifferent between the specific location and other alternatives in or out of the city (Saiz, 2003a). In fact, Saiz (2003a, 2003b, 2006) argues that an immigrant inflow of 1% of a city's population would be associated with increases in housing values and average rents of about 1%, although this also depends on the elasticity of housing supply. Such a positive relation between immigration and housing values can explain how immigration, by pushing up demand and turning house values from being below to being above replacement costs, may assist revitalisation of some declining areas (Saiz, 2003b; Saiz and Wachter, 2006).

Property values increase may prompt natives to migrate out of the areas in which immigrants move (Saiz, 2006). First to go are those individuals with relatively lower income, who are priced out of the market and obliged to move to other, cheaper, areas

within or outside the city¹ (Ley and Tutchener, 2001; Saiz, 2003a; Carter, 2005). However, more affluent people may also decide to leave. Pre-retired empty nesters and retired households might seize the opportunity of rising prices to cash in on high values and move to cheaper locations where they can purchase more housing amenities with their equity (Ley and Tutchener, 2001; Ley, 2003; Carter, 2005). Immigrants move in despite the high housing prices. Those who are wealthy enough can afford such prices, while the poor double-up in multi-family households and tolerate crowding, poor housing conditions and affordability problems in order to be close to their co-ethnics (Thave, 1999; Saiz, 2003a; Carter, 2005).

Over a longer period, the effect immigration has on property values is less clear. As long as immigrants do not displace previous settlers (natives as well as foreign-born) ‘one-for-one’, values will continue to rise, but as prices go up and ethnic enclaves materialise, more people may decide to migrate out. Since the area possesses ethnic-specific amenities, co-ethnics should be less prone to move out. Thus, the long-run impact of immigration on housing markets depends on the natives’ mobility and the amenity value they assign to living in proximity with the immigrant community² (Saiz, 2003a, 2006). As long as there are mobile ‘marginal’ natives who are indifferent about the ethnic composition of the neighbourhood, immigration will have no effect on housing (Greulich *et al*, 2003; Saiz, 2003a, 2006; Saiz and Wachter, 2006). Out migration of the natives (or even of earlier cohorts of immigrants), coupled by increase in housing supply, will eventually deflate the upward pressure of immigration to house rents and prices.

The situation would be different when natives have a preference for living in areas with no immigrants (on the basis of ethnic, racial or socioeconomic discrimination), or, to state it differently, when they are willing to pay a premium for living in areas with people of the same ethnic/racial background or socioeconomic status³ (Galster,

¹ So immigration causing higher property values, even in the absence of reduction in nominal wages, can explain why certain areas might become less affordable and attractive to low-skill, low-income native workers (Saiz, 2003b, 2006).

² This amenity value may be different in different locations and dependent on the characteristics of the immigrant population (Saiz, 2003a).

³ Glaeser and Saiz, (2004) and Saiz and Wachter (2006) argue that immigrant neighbourhoods may not becoming relatively less attractive because they are populated by foreigners per se, but because they contain population with perceived low socioeconomic status.

1990). In this case increase in a neighbourhood immigrant share may have a negative impact on housing values (Saiz and Wachter, 2006). This is because natives' preference for homogeneity will drive out high-income individuals, who are not replaced since in-migrants are generally of lower income, increasing high-quality housing vacancy rates and putting a downward pressure on prices of all housing units (Saiz, 2003a). The tendency is stronger, the more homogeneous and 'pure' the area was before the initiation of immigration (Saiz and Wachter, 2006).

It is interesting to mention that if there are no 'mobile' natives left in the immigrant neighbourhood, further immigration flows into the area will exert upward pressures on house prices and no price inflation in the rest of the city (Saiz and Wachter, 2006). Note also that if natives have a preference for ethnic or racial diversity, prices may go up in the immigrant neighbourhood since this will cause some natives to move into the area. Thus, immigration will push up housing values in a neighbourhood only if there are no marginal natives remaining or when natives have preference for diversity (Saiz, 2003a; Saiz and Wachter, 2006).

The results of the trade off between immigrant inflows and native outflows are important for understanding the social impact of immigration on destination areas and at the same time revelatory of the integration procedure of immigrants. Empirical evidence indicates that immigrant segregation in prime metropolitan areas of the USA and Canada has been on the rise over the last three decades (Cutler *et al*, 1999; Ley and Tutchener, 2001; Carter, 2005; Myers and Liu, 2005; Saiz, 2006; Moody, 2007), where new immigrant ghettos may be due to immigrants' preference for spatial clustering and, at the same time, natives' tendency for avoiding these areas.

Apart from the impact of immigration on housing values, researchers have also explored the tenure characteristics of immigrants. A number of factors are in play behind such choice, including immigrants' ethnicity, nationality, age, socioeconomic status, personal resources (language, education, occupation, income, etc.), mobility aspirations and country of settlement. Studies report the dominance of immigrants in the rental market and the relatively lower level of their participation in the owner-occupied sector (Burnley, 2005; Carter, 2005; Myers and Liu, 2005; Moody, 2007). Upon arrival immigrants are 'renters by necessity' due to lack of resources and their

high uncertainty as regards their staying in the place (Thave, 1999; Saiz, 2003a; Burnley, 2005; Carter, 2005; Myers and Liu, 2005; Moody, 2007). However, they tend to rapidly progress into homeownership with their growing experience and longer duration of stay in the destination country, approximating or even exceeding the homeownership attainments of comparable natives (Myers and Lee, 1998; Burnley, 2005; Carter, 2005; Myers and Liu, 2005; Moody, 2007). This is because homeownership becomes for immigrants a symbol of both economic success and integration into the host country.

Because of their relatively low earnings during their initial years in the host country, immigrants are disproportionately likely to demand lower cost housing and to trade housing affordability for housing quality. As a result they tend to occupy rental units of lower quality⁴ (Schill *et al*, 1998; Thave, 1999; Joint Center for Housing Studies, 2000; Saiz, 2003a; Carter, 2005). Moreover, researchers found that new immigrants are absorbed in the short-run entirely through higher occupation densities (Saiz, 2003a), and they end up living in overcrowded conditions (Schill *et al*, 1998; Carter, 2005). For some this is the norm, since they come from cultures with tradition in living with, and caring for, extended families (particularly the elderly kin). For others, residing and pooling resources with members of their extended family or even with non-relatives enables them to save money in order to advance their socioeconomic status more quickly or to send remittances back to the origin country.

Closing this section we should highlight once again that immigration *does* affect housing values. Immigration pushes up the demand for housing in the destination areas, resulting in short-term increase of house prices and rents, until the marginal immigrant is indifferent between the specific location and other alternatives in or out of the city. However, there are also convincing evidences suggesting that these effects may disappear in the mid-term or even be reversed in the long-run, depending on the mobility of the marginal native population and the amenity value they assign to living in proximity with the immigrant community. This can be negative or positive, determined by native's attitudes towards immigrants and their tolerance for ethnic, racial or socioeconomic segregation.

⁴ So the effect of immigration on low quality housing is stronger, and different quality segments of the housing markets may be differently affected by immigration.

5. Immigration and residential patterning in Greek metropolises

Over the last fifteen years or so Greece has received a substantial influx of immigrant population coming mainly from the Republics of ex-USSR, Central-East Europe, and the Balkans, especially from Albania⁵. The 2001 Census has recorded 797.000 people without Greek citizenship (that is 7.3% of the total population), of whom the vast majority (about 700.000) are third-country nationals without claim to Greek ethnicity. By 2003, there have been approximately 130.000 foreign children attending state schools (of which, 32.000 were ethnic Greeks), comprising the 11% of primary school registers and the 8% of secondary school registers (Baldwin-Edwards, 2005).

Just under half of Greece's immigrants live in Athens metropolis, of which about 55% (206.000 people) are Albanians (444.000 throughout Greece) (Baldwin-Edwards, 2005). This gives an immigrant/population ratio for the area of 11% as compared with 7,3% for Greece.

As regards the pattern of residential location of immigrants, researchers (Lazaridis, 1996; Psimmenos, 1995, 1998; Baldwin-Edwards, 2005) have reported a tendency of the former to concentrate in the old city centre and other poor areas of Athens which are characterised by low-quality housing and lack of public facilities. This literature identifies three reasons that inform such decisions. First is economic, where immigrants choose to take up residence in these areas simply because rents are low and there is housing stock available. This is supported by cultural reasons. Co-ethnics already reside in these areas, and newcomers decide to settle in there, in order to take advantage of the social and kinship networks which offer social and emotional support and valuable information regarding the host institutions and opportunities.

Interestingly, however, concentration is fuelled by a third factor: the xenophobic intolerance of the natives. Greece has a history of high levels of xenophobia recorded in opinion polls, although rather less visible in reality. In support of this argument Baldwin-Edwards (2005) mentions the results of a survey conducted in 2002 amongst

⁵ In fact, it is estimated that about half of the immigrants that reside in Greece today are Albanians (Lazaridis, 1996; Baldwin-Edwards, 2005).

2.100 households living in Greater Athens. It was found that 44% of respondents believed that immigrants should live, separately from Greeks, in other areas. Although high levels of racial intolerance are clearly linked with low educational and income levels, the point that clearly emerges is that Greeks would not object the creation of ethnic ghettos, presumably with little comprehension about their long-term implications. Other incidents that could be interpreted along this line include the continuing public advertisements and notices in Athens refusing to rent property to foreigners. As Psimmenos (2001) clearly states, few natives would be willing to rent their property to a foreigner (especially of Albanian origins) if there are chances to rent it to someone else.

This tendency of immigrants (a significant part of who were illegal) to locate in the inner-city of Athens worried the Greek government, who intensified policing of the area. Actually, this was so intense that in June 1998 migrants held a rally for the first time in Athens demonstrating for their right to have a place to live⁶ (Lazaridis and Psimmenos, 2000). Under the weight of this pressure some immigrants have moved out of the inner-city finding residence in the suburbs of Athens. Although some researchers (Lazaridis and Psimmenos, 2000) have linked this movement to the wider local-government strategy to regenerate the centre of Athens, the fact is that in spatial terms this gave rise to higher rates of integration between immigrants and natives and to a more dispersed residential pattern of the former. At present, despite some socio-spatial ethnic concentrations in certain areas, there are no ghettos of immigrants in Athens (Sintes, 2002; Kokkali, 2005), a situation which, however, is not difficult to change in the future (Baldwin-Edwards, 2005).

Thessaloniki presents a very similar case. Economic reasons on the part of the immigrants, and hesitance to rent property to foreigners on the part of the natives, led the immigrant population to take up residence in both the inner-city and the western suburbs where housing is cheap, constructions are old and the residential quality is low (Velentzas *et al*, 1996; Hatziprokopiou, 2003). However, there are no visible

⁶ Baldwin-Edwards (2005) argues that after intense criticism from leading academics, several state institutions and agencies dealing with immigrants on a regular basis have started to become more sensitised to issues relating to immigrants' rights and social integration. These agencies include various arms of the Ministry of Labour (OAED, IKA) and also the Greek Police to which clear instructions have been given in a circular from the Ministry of Public Order to strengthen immigrants' rights and prohibit police violence.

clusters of immigrants and the resulting pattern of residence do not seem to lead to any kind of excessive concentration in which ethnic practices could be developed (Kokkali, 2005).

6. Exploring immigrants' residential patterns in Volos

Although researchers have shown some interest in analysing the locational preferences of immigrants in the two Greek metropolises (Athens and Thessaloniki), there have been no studies (to our knowledge) exploring immigrants' residential patterns in other Greek cities. On these grounds, this section places focus in one, out of the four in total, medium-size city, the city of Volos, to shed light on immigrants' intra-urban location preferences and their residential characteristics.

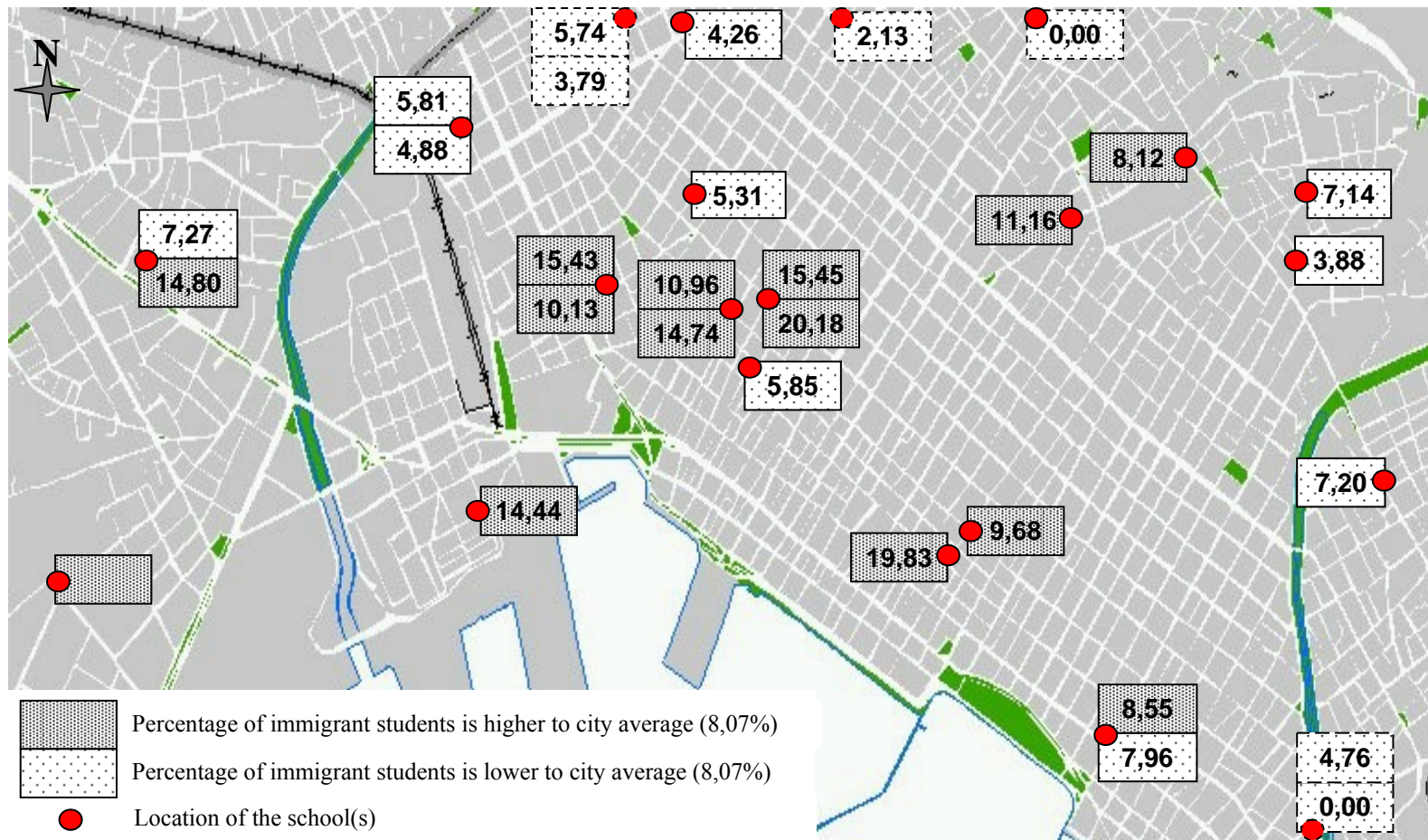
Unfortunately, there are no available official statistics specifying the spatial distribution of immigrants at the intra-urban level. The current study assumes that the intra-urban location of immigrants is reflected at the school enrolments of their children and collects such data from the totality of primary schools in Volos in order to explore the spatial distribution of immigrants in the city. We argue that such an assumption is valid on the basis of three grounds. First, both the spatial dispersion of schools in a city and the number of schools operating in each neighbourhood are analogous to the population density of this area. Second, the main criterion for the enrolment of a student into a particular school is the proximity of his/her house to the school under question. Third, primary education is compulsory (by law) to all immigrant children residing in the area, independent of the legal status of their parents, and the latter are eager their children to get this basic education.

In every prefecture of the country there is a local Directorate of Primary Education which holds student enrolment data for each school of its jurisdiction. The Directorate of Magnesia (Volos) has provided us with such data for the totality of 35 primary schools operating in the city over the current academic year (2006-2007). Overall there are about 5.232 enrolled students in these schools of which 8,07% are immigrants' children.

Map 1 below pinpoints the percentage of immigrant children in each school of Volos. As can be seen, immigrants are generally dispersed all over the urban area and there seems to be no high spatial clustering or formation of ‘ethnic enclaves’ in the city. However, the inner-city (comprising the traditional CBD and the extended city centre) seems to attract immigrants. In fact, it records the highest residential concentration of immigrants (equal to almost 15%). High concentrations are also evident in the western districts of the city (around the *Larisis Street*⁷), which are degraded, with inadequate public infrastructure and low quality housing stock, and in the north-east part of Volos, where the *Iolkos* and *Kyprou* Streets are passing through, connecting the city with the rural villages of Pelion (in which significant numbers of immigrants find employment). The presence of immigrants at the northern suburbs of the city as well as in *Anavros* area (bottom-right corner of Map 1), where the most affluent natives locate, is relatively low (about 6%).

⁷ This street leads to the PAThe highway (Patra-Athens-Thessaloniki) which connects Volos to Athens and Thessaloniki.

Map 1: Percentage of immigrant students in Volos primary schools



Source: Directorate of Primary Education of Magnesia, own construction

Apart from this simple cartographic representation of the locational distribution of immigrants within the city (provided in Map 1), the study have employed a widely-used measure of segregation, the Isolation Index, to identify the degree at which immigrants live apart from natives. According to Lieberson (1981) the Isolation Index of Segregation (IIS) is:

$$IIS_i = \sum_{i=1}^n \frac{x_i}{X} \cdot \frac{x_i}{t_i}$$

where:

x_i is the number of immigrants in a neighbourhood i

t_i is the total population of the neighbourhood i

X is the total population of immigrants in the city.

The index is, in fact, a measure of the probability of one member of the immigrant group encountering another member at random: the greater the concentration of immigrants into relatively exclusive residential areas, the greater the index (which can vary from 0 to 1). It therefore meets three criteria regarding the nature of residential segregation (to the extent that this is possible with a single index): the degree of *residential concentration*, or the extent to which a group dominates certain areas; the degree of *spatial assimilation*, or the extent to which residential space is shared between groups; and the degree of *encapsulation*, that is, the extent to which any one ethnic group is isolated residentially from the ‘host society’.

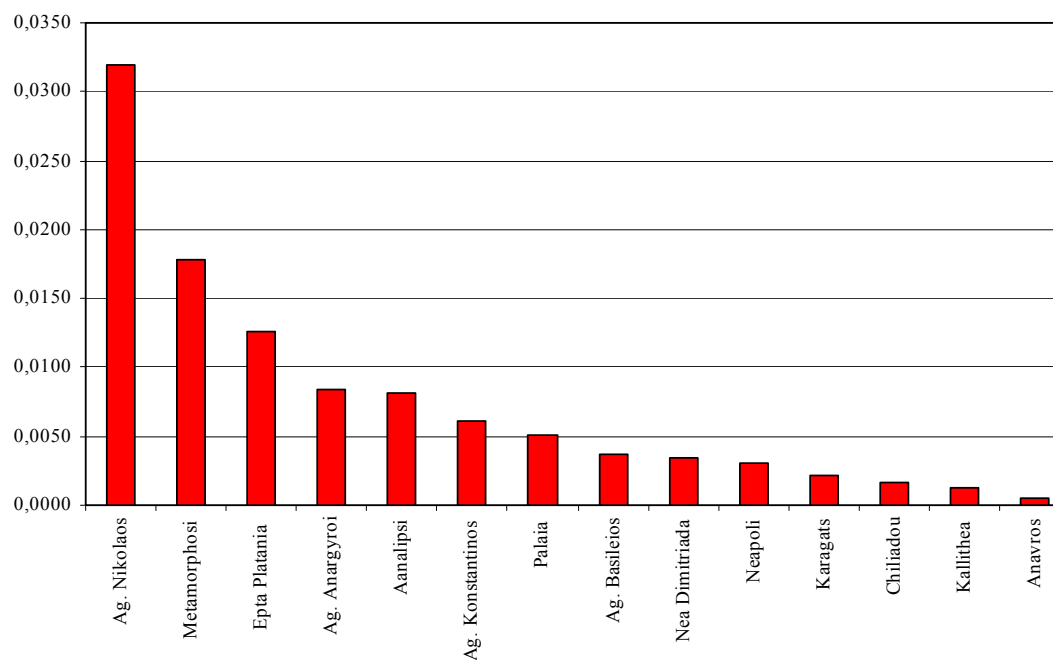
Table 1 provides the IIS calculation for each area (neighbourhood). Neighbourhoods are ranked according to the IIS in Figure 2 and results are plotted in Map 2 (below). As can be seen, the traditional CBD area (*Ag. Nikolaos*) exhibits the highest concentration of immigrants, recording the highest IIS value, which is almost double of the next higher. Next, in terms of immigrant concentration, come the areas of *Metamorphosi* and *Epta Platania* which constitute the extended city-centre (Skouras and Arvanitidis, 2007). This affirms our previous assertion that immigrants show a preference for locating in the inner-city. Immigrant segregation seems to diminish with the distance from the city-centre. However, immigrants can be found in almost all areas of the city. The lowest IIS value is recorded in *Anavros*, which is regarded as the residential area of people of high socioeconomic status.

Table 1: Calculation of the Isolation Index of Segregation (IIS)

<i>Area</i>	x_i	t_i	x_i/X	x_i/t_i	IIS
Ag. Nikolaos	88	653	0,237	0,135	0,0320
Metamorphosi	61	561	0,164	0,109	0,0179
Epta Platania	48	491	0,129	0,098	0,0126
Ag. Anargyroi	28	252	0,075	0,111	0,0084
Aanalipsi	27	242	0,073	0,112	0,0081
Ag. Konstantinos	28	343	0,075	0,082	0,0062
Palaia	13	90	0,035	0,144	0,0051
Ag. Basileios	22	350	0,059	0,063	0,0037
Nea Dimitriada	18	250	0,049	0,072	0,0035
Neapoli	13	147	0,035	0,088	0,0031
Karagats	16	318	0,043	0,050	0,0022
Chiliadou	14	312	0,038	0,045	0,0017
Kallithea	14	399	0,038	0,035	0,0013
Anavros	8	321	0,022	0,025	0,0005

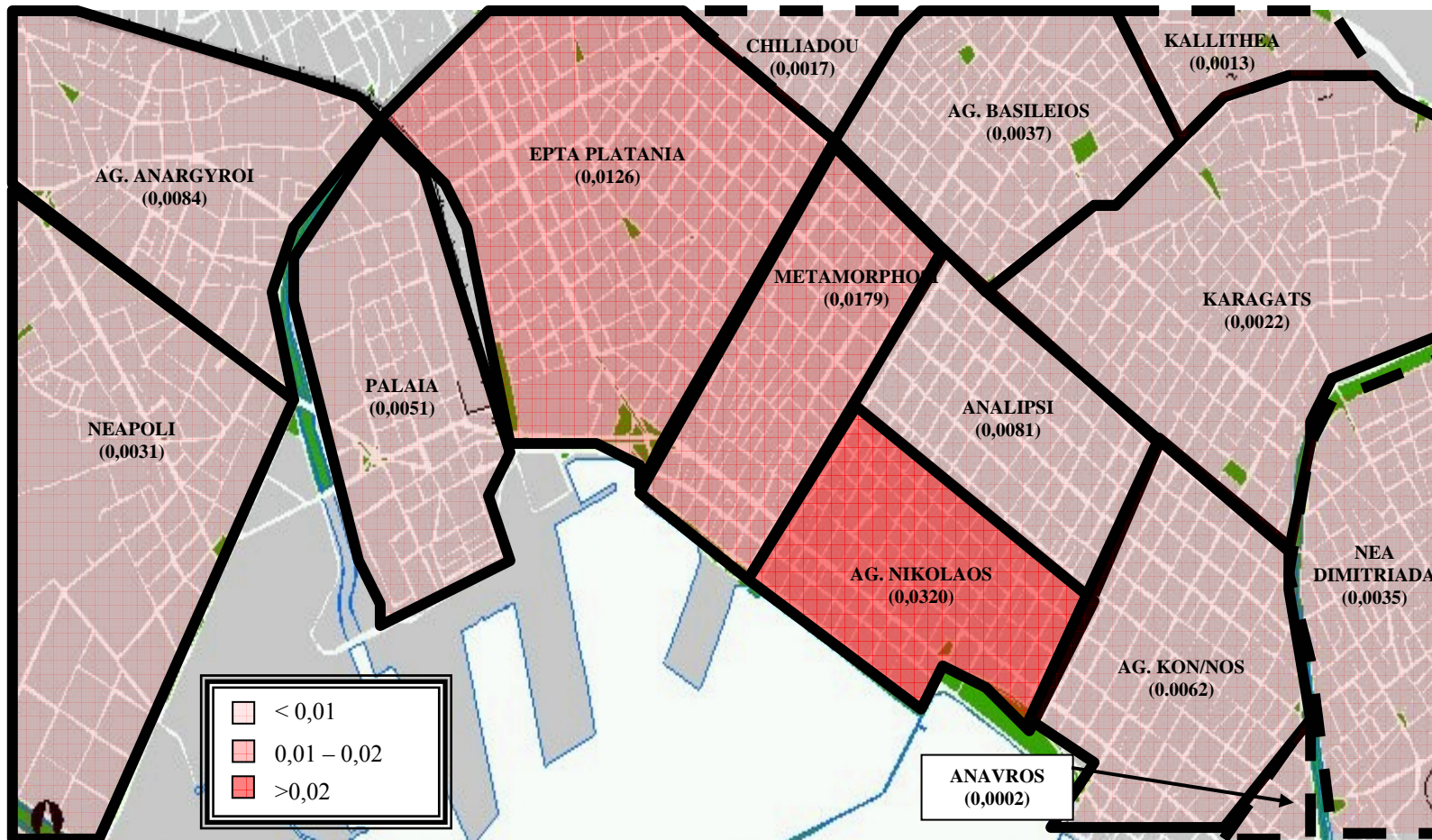
Source: Own construction

Figure 2: Rank of neighbourhoods according to the Isolation Index of Segregation (IIS)



Source: Own construction

Map 2: Isolation Index of Segregation (IIS) for each neighbourhood



Source: Own construction

As discussed in the previous section, the literature argues that immigrants tend to occupy olden houses of lower quality. We explore whether this is the case in the city of Volos. The Directorate of Urban Planning of Volos Municipality has provided us with data on the construction activity in the city. Over the period 1999-2004 in Volos there had been built 561 new buildings, providing 5.266 new houses and taking up almost 400.000 m² (see Table 2).

Table 2: Construction activity in Volos

<i>Year</i>	Number of new buildings	Number of new flats	Area (m²)
1999	56	608	48.412
2000	68	713	58.023
2001	74	859	64.585
2002	100	1055	76.290
2003	174	1202	91.796
2004	89	829	59.903
TOTAL	561	5266	399.009

Source: Directorate of Urban Planning (Volos Municipality), own construction.

Table 3, Figure 3 and Map 3 present the distribution of immigrants and the housing construction activity that took place in each neighbourhood of Volos. It appears that the majority of immigrants locate in areas of relatively old housing stock⁸. In particular, the traditional CBD (*Ag. Nikolaos*) houses almost a quarter of the city's immigrants but only 3,84% of the new construction occurred there. Similar is the case in *Epta Platania* (the extended city-centre). In contrast, the areas of *Ag. Konstantinos*, *Nea Dimitriada* and *Karagats* get a significant amount of new houses but small numbers of immigrants. Interesting is the case of the *Metamorphosi* area. Since it constitutes a recent extension of the CBD it has attracted quite a lot of new construction. At the same time, more than 15% of the immigrants prefer to locate there probably in the older and cheaper housing stock that is available.

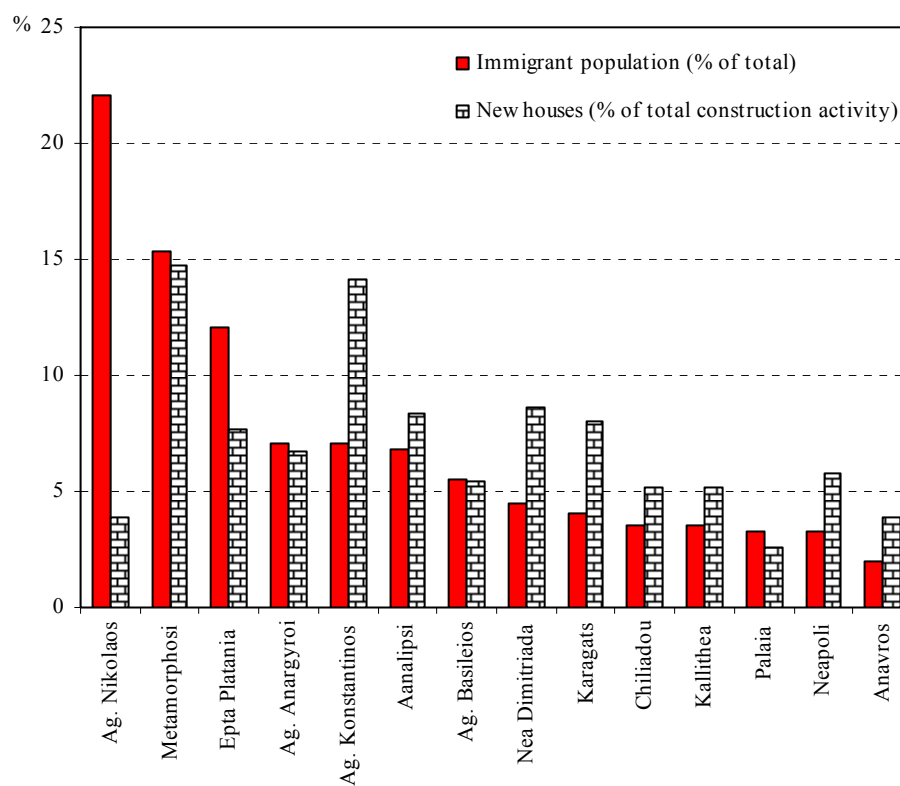
⁸ However the Pearson correlation between the percentages of immigrant population and new house construction in each neighbourhood is low (0,246) and not significant.

Table 3: Distribution of immigrants and new houses in Volos

<i>Areas</i>	Immigrant Population (% of total)	New houses (% of total construction activity)
Ag. Nikolaos	22,11	3,84
Metamorphosi	15,33	14,74
Epta Platania	12,06	7,69
Ag. Anargyroi	7,04	6,73
Ag. Konstantinos	7,04	14,10
Aanalipsi	6,78	8,33
Ag. Basileios	5,53	5,45
Nea Dimitriada	4,52	8,65
Karagats	4,02	8,01
Chiliadou	3,52	5,13
Kallithea	3,52	5,17
Palaia	3,27	2,56
Neapoli	3,27	5,76
Anavros	2,01	3,84

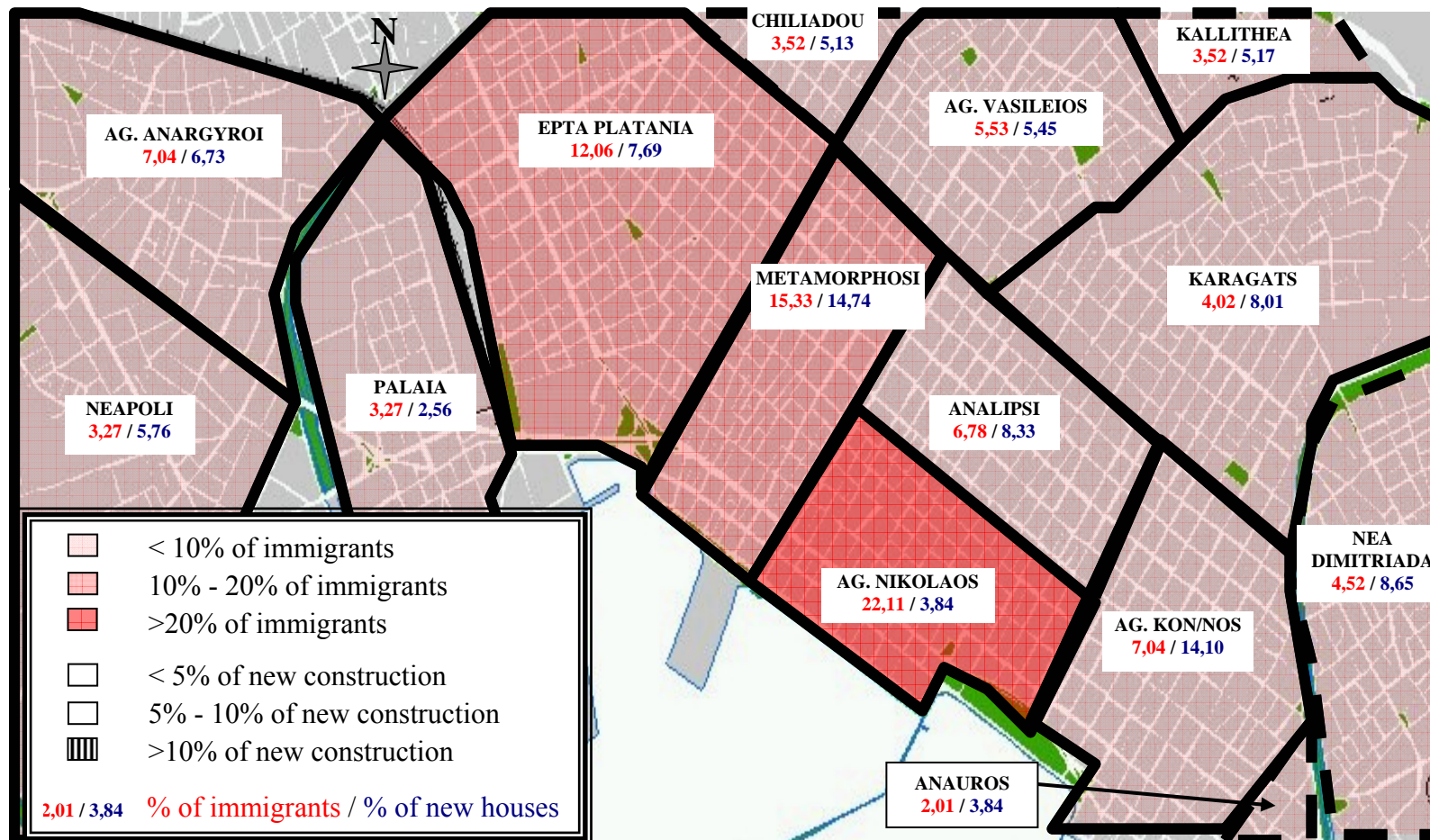
Source: Own construction.

Figure 3: Immigrant population and new construction per neighbourhood



Source: Own construction.

Map 3: Immigrant population and new construction per neighbourhood



Source: Own construction

Summarising, we should highlight that immigrants are located in almost all areas of Volos and there no clear signs of ‘ethnic enclave’ formation. However, two stylised facts are also evident. First, the inner-city areas exert an attraction to many immigrants (reflected in the higher percentages of immigrant children in these areas compared to other urban neighbourhoods), which are drawn there by virtue of the old, low-quality, low-priced housing stock which is available. This relates to the second stylised fact, that the high-status, newly-constructed relatively-expensive residential suburbs, where the most advanced natives reside, do not attract many immigrants. This can be attributed partly to the high-cost of living in these areas (in terms of housing, commuting, etc.). On these grounds we can argue that the most significant factors in determining immigrant’s locational behaviour in Volos are mainly economic.

7. Immigration, neighbourhood structure and the housing market: a theoretical model

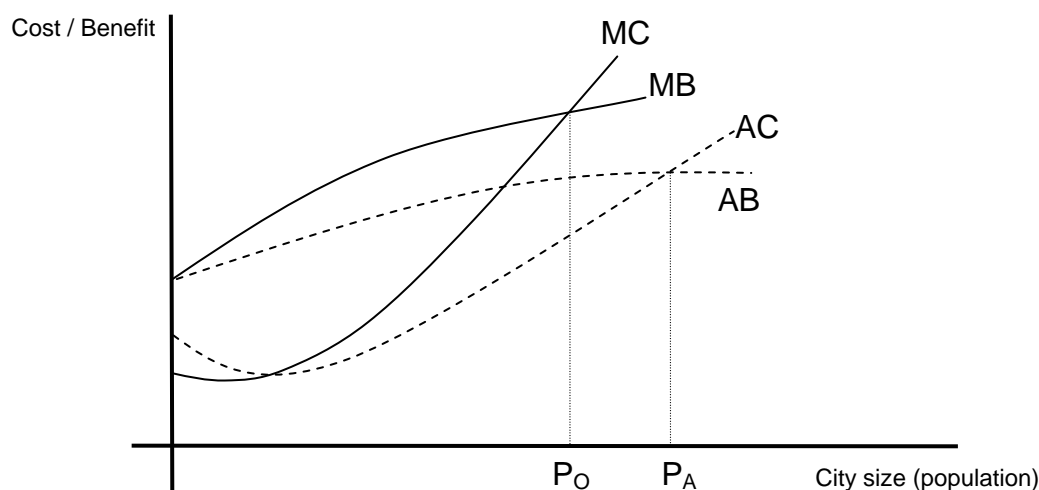
Drawing on urban and property economics, this section develops a framework to advance understanding of the emerging patterns of immigrants’ intra-urban location and the impact this has on the housing market of the area. It starts by formulating a theoretical model to explain the residential distribution of immigrants. This analysis indicates that for any intra-urban area (neighbourhood) there is an optimal population size beyond which additional costs exceed additional benefits⁹. The section then moves to explore how the demand for housing is affected by the emerging population mix of the area.

Our approach takes stock in the theory of city size developed by urban economics (see Alonso, 1971; Evans, 1985). This is represented in Figure 4 below. City size, which is reflected in the population size, is measured along the horizontal axis, whereas costs

⁹ A similar line of argument can be traced in the economic analysis of national immigration policies. In particular, the first economic assessment criterion of a nation immigration policy states that a host country should admit immigrants up to the point where an additional person makes a non-negative contribution to the treasury (Simon, 1984); that is, the marginal cost of an extra immigrant in the country is just equal to the marginal benefit.

and benefits are measured along the vertical axis¹⁰. Cost in this context refers to all costs of whatever kind, including private, public and social costs (e.g. housing costs, labour costs, the cost of pollution, congestion and crime, as well as costs of local-government services). In turn, benefit represents all kind of social and private benefits that arise due to agglomeration economies. It is generally accepted (Alonso, 1971) that average costs per capita are expected to fall over some range as population increases, and then begin to rise. In turn, average benefits are expected to rise with population size but less and less rapidly as diminishing returns set in. Since both costs and benefits are rising, marginal cost and benefit are greater than the average cost and benefit (the marginal curves are on the left of the average curves).

Figure 4: Optimal city size



Source: Evans (1985: 80)

Economic theory suggests that the optimal size of city would be at a population P_O where the marginal cost (MC) caused by the settlement of an additional person in the city equates the marginal benefit induced (MB) (see Figure 4). At any greater population the additional cost would be greater than the additional benefit. Moreover, welfare economics demonstrates that if entry is unregulated, the city may grow beyond P_O . This is because an individual in-migrant will receive a net gain from moving into the city that outweighs its loss due to increase of marginal cost over marginal benefit caused by his own entry. Therefore it is expected that as long as average benefit per person is higher than the average cost per person, the city will

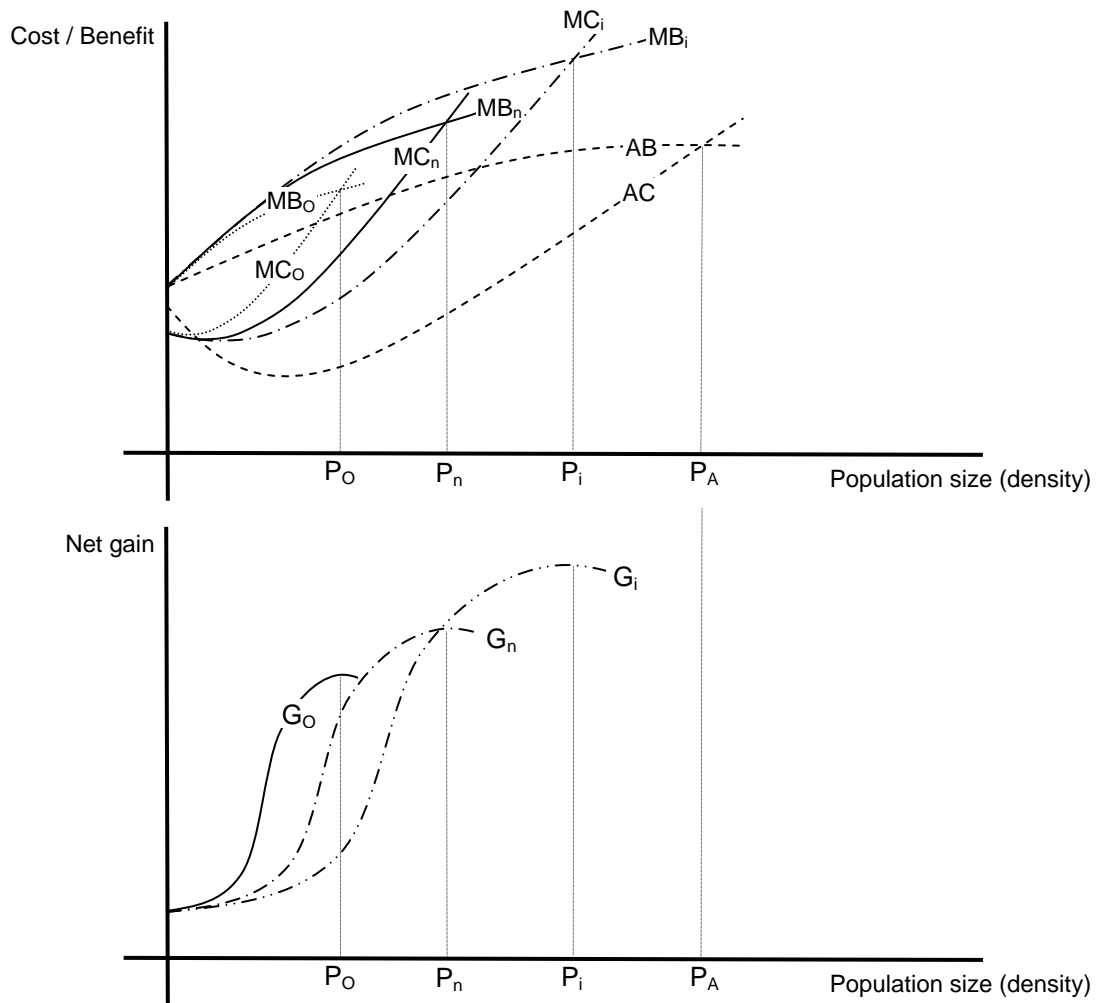
¹⁰ It is assumed, therefore, that cost and benefit are measurable and vary only with city size, and not with other parameters such as urban form and density.

grow until it reaches point P_A at which average cost (AC) equates average benefit (AB).

We argue that the above analysis can be applied at the intra-urban level to describe the optimal distribution of both immigrants and natives in a neighbourhood. What has to be considered is the relevant position of marginal benefit and marginal cost curves of both immigrant and native populations. As above, the benefit and cost curves take into account all kind of benefits and costs generated in the neighbourhood due to agglomeration economies and diseconomies. That is, they incorporate all private, public, as well as social and cultural benefits and costs. These, however, are expected to be different for each population group (natives and immigrants). Immigrants are expected to enjoy greater benefits, and to incur lower costs, in comparison to a native community. Benefits are greater due to intra-ethnic cultural amenities and economic externalities emanating from the social network developed between co-ethnics. Costs are lesser because of transaction and information costs saved, or, at the least, because immigrants consume less housing space per head and their housing expenses are lower than these of natives'. This means that the higher the proportion of immigrants in a neighbourhood, the lower the marginal cost and the higher the marginal benefit would be. To state it differently, as the mix of population in a neighbourhood changes in favour of the immigrants, the marginal cost curve moves to the right and the marginal benefit curve moves to the left. On these grounds, it is expected that the optimal size of a neighbourhood comprising of immigrants to be bigger compared to neighbourhood size that consists of natives.

Figure 5 (below) articulates the argument developed here. The horizontal axis assesses neighbourhood population size. This is, in fact, the population density of a neighbourhood, since its area is given and constant. The vertical axis measures costs and benefits (upper diagram), or their difference which is the net gain (lower diagram). The optimal population size of neighbourhood without immigration is at P_O . This is at the point where the marginal benefit stemming of the advent of an additional native person (i.e. non-foreigner) equates the marginal cost (indicated by the intersection of the curves MC_O and MB_O), or where the net gain curve (G_O) reaches its highest level.

Figure 5: Optimal neighbourhood size with immigration



Source: Own construction

With immigration, ‘foreigners’ flow in and the population mix of the neighbourhood starts to change. As indicated, the optimal neighbourhood size is expected to be different for each group of inhabitants. From the point of view of the immigrants that reside in the neighbourhood, the optimal neighbourhood size would be at population P_i where the marginal benefit of an additional immigrant equates the marginal cost. This is the point where the MC_i curve meets the MB_i curve, or where the curve of net gain G_i (as this is perceived by the immigrant community) reaches the highest point (Figure 5). From this point onwards, the location of any additional immigrant in the neighbourhood will increase the marginal cost over marginal benefit for the immigrant community and, therefore, for the whole community. It is important to mention that P_i refers to a population mix, consisting of both immigrants (P_{ij}) and

natives (P_{in}), which is optimal from the point of view of the immigrant community residing in the neighbourhood.

At the same time the optimal neighbourhood size from the perspective of the natives which reside in the neighbourhood would be at population P_n where marginal benefit of an additional immigrant equates the marginal cost. This is the point where the MC_n curve intersects the MB_n curve, or where the net gain curve G_n of natives reaches the highest point (Figure 5). It is important to clarify here that P_n specifies a population mix of immigrants (P_{ni}) and natives (P_{nn}) which is optimal from the point of view of the native community residing in the neighbourhood. Although this consists of fewer foreigners compared to the population mix of P_i (i.e. $P_{in} < P_{nn}$ or $P_{ii} > P_{ni}$), it indicates the maximum amount of immigrants that the natives are willing to accept in the neighbourhood (P_{ni}).

The basis of the model just outlined enables also the exploration of the dynamics of immigration. In terms of the resulting population mix three cases are of particular interest, which speculate on the degree of immigrant segregation that may occur. These are: *latent segregation*, *emerging segregation* and *mature segregation*, and are discussed next.

Latent segregation: Immigrants start to flow into the neighbourhood. The natives accept this inflow as long as the total population of the community stays below or equal to P_n , or as long as the population of immigrants residing in the neighbourhood is below or equal to the limit of P_{ni} set by the natives. Up to this point the population of natives remains stable, since natives have no reason to flee out. The total population of the neighbourhood is growing, however, due to inflow of immigrants. The rate of immigrant inflow depends on the size of the existing immigrant community and the quality of its existing social network (i.e. the intra-ethnic socio-cultural amenities), as well as on local conditions and institutions. This process may result in immigrant isolation and spatial evenness or it may exhibit signs of residential clustering with immigrant exposure (depending on the cultural characteristics of the immigrants).

Emerging segregation: Immigrants continue to flow into the neighbourhood expanding its population over the limit of P_n (or P_{ni}) but without exceeding the limit of P_i (or P_{ii} , which is the optimal amount of in-migrants from the point of view of the immigrant community). At this point natives are not willing to accept such inflow and start fleeing out of the neighbourhood. However, the immigrant community which dwells in the neighbourhood is expected to have a net gain (marginal benefit would be higher to marginal cost, mainly due to the advancements in the intra-ethnic socio-cultural amenity) and to remain located in the neighbourhood. The resulting population mix will depend on the rates of both immigrant inflow and native outflow. There are three possible scenarios, all of which may lead to further segregation of immigrants; though the nature and pace of concentration would be different in each case. First, the amount of natives leaving the neighbourhood is lower compared to the amount of immigrants coming into the neighbourhood. In this case, the optimal total population of the neighbourhood reaches the point of P_i . What we could probably observe in this case is increasing immigrant exposure combined with residential clustering. The second possible case is when the amount of natives leaving the neighbourhood is equal to the amount of immigrants coming into the neighbourhood. Here the total population of the neighbourhood stabilises at a point between P_i and P_n . The spatial pattern we expect to see is characterised by increased residential clustering. Finally, the amount of natives leaving the neighbourhood is greater compared to the amount of immigrants coming into the neighbourhood. In this case the total population of the neighbourhood is expected to exceed, but stay close to P_n , whereas the emerging residential pattern would probably be characterised by immigrant clustering.

Maturing segregation: Immigrants continue to flow into the neighbourhood and the population surpasses the limit of P_i (or P_{ii}). At this point not only remained natives but also settled immigrants are discontent with the result and decide to move out of the neighbourhood. From the latter group, those people that are able to do so are the most advanced (in terms of wealth, education, etc.) members of the community which are expected to indicate high levels of acculturation. The total population of the neighbourhood may increase, be stable or decline depending on the relative rates of population outflow and immigrant inflow. However, the process is expected to result

in increasing levels of immigrant clustering and isolation, and the development of distinct immigrant enclaves.

Let us now consider the effect immigration may have on the housing market and particularly on the housing demand. It is widely known that the main determinant of the demand for housing is the size of the population¹¹: the more people in the area, the greater the demand for housing. On these grounds we assume that the demand for housing (D) is a function of the population of the area (P), which in its simplest form is a linear function with no constant (since there is no demand if there are no people) and a coefficient β :

$$D = f(P) = \beta P$$

Given that the overall population is the sum of the natives and immigrants in an area, the total demand for housing (D_T) would be the sum of natives' demand (D_n) plus the demand stemming from immigrants (D_i). Substituting coefficients α_n and α_i (slopes) with the derivatives we get:

$$D_T = D_n + D_i = \beta_n P_n + \beta_i P_i = \frac{\partial D_n}{\partial P_n} P_n + \frac{\partial D_i}{\partial P_i} P_i$$

The changes in the total demand for housing caused by marginal changes in the natives' population and in the immigrants' population are, respectively:

$$f'(D_T) = \frac{\partial D_T}{\partial P_n} = \frac{\partial D_n}{\partial P_n}$$

$$f'(D_T) = \frac{\partial D_T}{\partial P_i} = \frac{\partial D_i}{\partial P_i}$$

Since immigrants live in overcrowded conditions, they consume less housing compared to natives (see section 4). Therefore:

$$\frac{\partial D_n}{\partial P_n} > \frac{\partial D_i}{\partial P_i}$$

¹¹ Although other factors, like income, consumer preferences, price of housing, cost and availability of credit, etc. all play a role.

Given the above set of equations, this means that a change in natives' population will cause greater change in the total demand, compared to this caused by the immigrants, i.e. the total demand is more sensitive to changes in natives' population:

$$\frac{\partial D_n}{\partial P_n} > \frac{\partial D_i}{\partial P_i} \Rightarrow \frac{\partial D_T}{\partial P_n} > \frac{\partial D_T}{\partial P_i}$$

On the basis of the conceptualisation developed here, let's now discuss the impact of population movements, i.e. the inflow of immigrants and the outflow of natives, and the resulting population mixes on the demand for housing in an area (i.e. a neighbourhood). Three possible scenarios can be distinguished. First, immigrants move in and natives remain in the area (latent concentration), or, to state it formally, there is a positive change of immigrant population ($\Delta P_i > 0$) and no change in native population ($\Delta P_n = 0$). Here, the net increase of population is expected to push up the demand for housing in the area, resulting, in the short-term, in inflation of house prices and rents (since housing supply is inelastic in the short-run).

Second, the number of natives leaving the neighbourhood is equal or greater to the amount of immigrants moving into the neighbourhood, or, more formally, $|\Delta P_n| \geq |\Delta P_i|$. In this case, reduction in housing consumption caused by migration (due to the fact that immigrants consume less housing in comparison to natives) will lessen the total demand for housing, putting a downward pressure on the prices and rents of all housing units. Please note that when natives' outflow equals immigrants' inflow, the overall population of the area remains unchanged and the negative impact on house values comes only from the decrease of the total amount of housing that the population consumes. In the other case (that is when out-migration exceeds in-migration), demand diminishes due to decrease of the total population and the change in the housing consumption pattern.

Third, the population of natives which are fleeing out is lower compared to the population of immigrants that are flowing into the area, that is: $|\Delta P_n| \leq |\Delta P_i|$. In this case the impact of immigration on the housing market is less straightforward, as compared to the previous cases. This is because the demand for housing depends both on the size of the population and on the housing consumption pattern of the groups

locating in the area (natives and immigrants). Therefore, the change of total housing demand (ΔD_T) is affected both by the changes in the total population and by changes in the total housing consumption. That is:

$$\Delta D_T = |\Delta P_i| \frac{\partial D_i}{\partial P_i} - |\Delta P_n| \frac{\partial D_n}{\partial P_n} = |\Delta P_i| \frac{\partial D_T}{\partial P_i} - |\Delta P_n| \frac{\partial D_T}{\partial P_n}$$

On these grounds we argue that there would be no change in housing demand, and therefore in housing values, when the number of natives moving out (ΔP_n) is smaller compared to the number of immigrants moving in (ΔP_i) by the factor $\varphi = \frac{\partial D_T}{\partial P_i} / \frac{\partial D_T}{\partial P_n}$, which is the ratio of marginal change of housing demand caused by

immigrants to the marginal change of demand caused by natives. This is because the housing commodity consumed by the marginal native is greater to this of the marginal immigrant. Formally,

$$\frac{\partial D_n}{\partial P_n} > \frac{\partial D_i}{\partial P_i} \Rightarrow \frac{\partial D_T}{\partial P_n} > \frac{\partial D_T}{\partial P_i} \Rightarrow \frac{\frac{\partial D_T}{\partial P_i}}{\frac{\partial D_T}{\partial P_n}} < 1 \Rightarrow \varphi < 1$$

and

$$\Delta D_T = 0 \Rightarrow |\Delta P_i| \frac{\partial D_T}{\partial P_i} = |\Delta P_n| \frac{\partial D_T}{\partial P_n} \Rightarrow |\Delta P_n| = \frac{\frac{\partial D_T}{\partial P_i}}{\frac{\partial D_T}{\partial P_n}} |\Delta P_i| \Rightarrow |\Delta P_n| = \varphi |\Delta P_i|$$

Similarly, increased housing demand (and, so, inflated house prices and rents) is to be seen when the number of natives fleeing out is smaller to the number of immigrants moving in multiplied by φ , or when the ratio of change of native population to the change of immigrant population is lower than φ . Formally,

$$\Delta D_T > 0 \Rightarrow |\Delta P_i| \frac{\partial D_T}{\partial P_i} > |\Delta P_n| \frac{\partial D_T}{\partial P_n} \Rightarrow |\Delta P_n| < \varphi |\Delta P_i| \Rightarrow \frac{|\Delta P_n|}{|\Delta P_i|} < \varphi$$

Likewise, reduced total demand for housing, with a consequent downward pressure on the prices and rents of all housing units, is expected when the number of out-migrating natives is greater to the number of immigrants flowing in multiplied by φ ,

or when the ratio of change of native population to the change of immigrant population is greater to φ . Formally,

$$\Delta D_T < 0 \Rightarrow |\Delta P_i| \frac{\partial D_T}{\partial P_i} < |\Delta P_n| \frac{\partial D_T}{\partial P_n} \Rightarrow |\Delta P_n| > \varphi |\Delta P_i| \Rightarrow \frac{|\Delta P_n|}{|\Delta P_i|} > \varphi$$

Concluding, with regard to the impact immigration will have on the housing market, it must be stressed once again that it is not only the number of people residing in the area that affect housing demand and property values, but also their housing consumption behaviour and resulting patterns.

8. Conclusions

This paper has analysed the intra-urban locational preferences of immigrants, the resulting patterns of population distribution, and the impact these have on the local housing market. Analysis was conducted on both theoretical and empirical fronts. As regards the latter, the paper has first reviewed the relevant literature to outline the international and national experience on the locational patterns of immigrants, before it moved to examine the intra-urban spatial distribution of immigrants in the medium-size city of Volos and to consider whether segregation is evident. Moreover, drawing on urban and property economics, the paper developed a theoretical framework assessing the optimal distribution of immigrants and natives within city areas and the impact of their locational decisions on the local housing market.

What becomes apparent from the review of the literature is that immigrants' intra-urban location decisions are informed by cultural and economic reasons. Cultural explanations place emphasis on the ethnic-specific, socio-cultural networks that are developed within ethnic enclaves, and the various benefits (emotional, cultural, social, informational, etc.) immigrants acquire by locating in there. Economic explanations draw attention to the functioning of both the labour and the housing markets, asserting that newcomers are compelled to live close to each other due to the financial and information problems that they encounter. Empirical studies that examined the issue have affirmed the fact that immigrants tend to cluster close to their co-ethnics.

However, they have also indicated that there is no uniformity with regard to the pattern of immigrant residential location that each place experiences. Stated differently, economic and cultural factors influence at a different degree the locational choice and the residential patterns of immigrants, depending on the local conditions, policies and institutions, the cultural background of immigrants and the time that immigration takes place.

Although quite a lot of studies have analysed the residential location of immigrants, few have examined its impact on the urban housing markets. The latter stream of research has concluded that a positive relation between immigration and housing values exists in the short run. However, increasing property values and the development of ethnic enclaves, may prompt some natives to migrate out of the areas in which immigrants locate. Thus, the long-run impact of immigration on housing markets depends on the natives' mobility and the amenity value they assign to living in proximity with the immigrant community. This can be negative or positive, determined by the native's attitudes towards immigrants and their tolerance for ethnic, racial or socioeconomic segregation. Apart from the impact of immigration on housing values, researchers have also explored the housing characteristics of immigrants. They reported that immigrants are disproportionately likely to demand lower-cost housing, occupy rental units of lower quality, live in overcrowded conditions and, so, consume less housing in comparison to natives.

The findings of the empirical research conducted by the current study indicate that the intra-urban locational pattern of immigrants living in Volos (one, out of four in total, medium-size Greek cities) is similar to those observed in Athens and Thessaloniki. In particular, the immigrant community is generally dispersed in almost all urban neighbourhoods and no clear 'ethnic enclaves' are identifiable. However, two stylised facts are evident. First, the inner-city areas exert an attraction to many immigrants (reflected in the higher percentages of immigrant children in these areas compared to other urban neighbourhoods), which are drawn there by virtue of the old, low-quality, low-priced housing stock which is available. This relates to the second acknowledged stylised fact; which is that the high-status, newly-constructed relatively-expensive residential suburbs, where the most advanced natives reside, do not attract many immigrants. This can be attributed partly to the high-cost of living in these areas (in

terms of housing, commuting, etc.). On these grounds we can argue that the most significant factors in determining immigrant's locational behaviour in Greek cities today are mainly economic, though cultural reasons also play an important role.

The articulation of a conceptual model that is able to analyse inter-urban residential structures on the basis of the optimal allocation of immigrants and natives has been another outcome of this research. Two key arguments have been deployed. First, drawing directly on urban economics, we have argued that the optimal size of an intra-urban area (neighbourhood) is achieved when the marginal cost caused by the settlement of an additional immigrant in the neighbourhood equates the marginal benefit induced. Second, we have stressed that each group of inhabitants has a difference perception of the optimal size of neighbourhood, and therefore they respond differently in immigration inflows. As such, different population mixes of natives and immigrants can be developed, giving rise to different spatial patterns characterised by different degrees of immigrant segregation.

Population movements (i.e. inflow of immigrants and outflow of natives) and the housing consumption preferences of each population group, account for the specific impact immigration will have on the housing market of the area. Since immigrants are likely to live in overcrowded conditions, they consume less housing in comparison to natives and, therefore, total housing demand is more sensitive to changes in natives' population. This means that there may be no change in the demand for housing even when inflowing immigrants surpass in numbers the out-migrating natives, but up to a point. This is the ratio of marginal change of housing demand caused by immigrants to the marginal change of demand caused by natives. When immigration exceeds this limit, housing demand is to be increased, causing inflation of house prices and rents. Immigration below this point, or alternatively greater outflow of natives, will result in reduction of total housing demand with a consequent downward pressure on the prices and rents of all housing units.

Further research is required to explore in depth the spatial outcomes of immigration and its impact on the property market values. In this paper we have attempted to shed some light on the relation between location patterns of immigration and their impact on housing market, but further research is essential. Future work should attempt to

address these issues empirically and to explore how immigrants' locational behaviour influences property market outcomes in real situations.

Concluding this paper we would also like to stress one more point. The conceptual framework developed here should be seen as an attempt to inform the literature of immigration with some ideas stemming from the urban economics discipline. We strongly believe that social sciences on the whole and each particular subject have much to gain by such communication and exchange of knowledge.

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