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Successional segregation in Gerani, Athens.

Unpacking the spatial structure of an immigrant quarter

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Abstract

This study examines the role of spatial configuration in shaping patterns of immigrant segregation through the case study of Gerani, Athens. Previous research has suggested that despite its negative effects, segregation can be positive as a key mode of accommodating urban diversity. In this context, this study asks what is the role of space in shaping immigrant segregation patterns and accommodating difference.

Although Greece has accepted major migration waves during the last decades, the Greek state is characterised by the lack of internal policies towards immigrants' integration, leading to social friction. The district of Gerani reflects the current socioeconomic and spatial transformations of the Greek capital and is chosen for this study as a multi-ethnic district and the most distinct commercial immigrant centre of Athens. The existence of a certain degree of informality that characterises both the built environment and the local economic activities reveals the structure of spontaneous socioeconomic patterns. After establishing the spatial properties of the area through space syntax analysis, the immigrant networks are mapped through primary ethnographic research tracking the development of immigrant economic activities. Finally, the above analyses are combined qualitatively and quantitatively, through statistical analysis.

The study suggests that Gerani's spatial configuration might be related to its consistent deprivation and, consequently, to the concentration of high immigrant densities. Furthermore, despite the supposed homogeneity of the "ghetto" of Gerani, the various ethnic groups appear clustered in the area in terms of economic activities and use of the public realm, while an internal hierarchical rationale emerges; locations characterised by higher levels of "natural movement" and proximity to attractors have clusters of those immigrants who have achieved greater social integration with Greek society, whilst locations with lower levels of "natural movement" and adjacent to abandoned enclaves of anomy have concentrations of the more socially disadvantaged groups.

Overall, the issue of immigrant integration and segregation remains mainly a political issue that premises the adoption of long term external and internal policies. Considering, however, the role of spatial design in this process, the current study proposes that specific spatial structures offer immigrants the necessary protection to gradually build their socioeconomic life. These principles should be re-interpreted and assimilated in strategic design proposals and policies that aim at the creation of more socially inclusive solutions.

Keywords

Immigrants, segregation, space syntax, greece, Athens, Gerani, spatial configuration, urban morphology.

1. Introduction

Despite the major immigrant inflows that Greece has accepted during the last decades, the internal policies adopted by the state towards immigrant integration have proven insufficient, leading today to social segregation and friction between native Greeks and incomers. The spatial aspects of these phenomena can be grasped through a study of the various patterns of immigrant appropriation of space and, in particular, the way in which different spatial scales of activity correspond to patterns of immigrant settlement.

According to current discussions, attempting to understand immigrant segregation premises the study of its various manifestations and the coupling of scientific knowledge to modular every day practices (Carling, 2008; Hall, 2013). Much of the discourse around immigrant segregation conflates physical clustering with social segregation, with only in recent times a more nuanced discussion of the differences being manifest (Peach, 1996; Phillips, 2006; Simpson & Finney, 2006). Other research using space syntax has suggested that, despite its negative effects, spatial clustering can be beneficial for newly arrived immigrant groups, providing them the necessary protection that allows them to gradually become integrated into the host society (Kershen, 2004; Vaughan & Penn, 2006).



Figure 1: The area of Gerani (Theodorou et al., 2010)

Within this context this study attempts to unpack the social, economic and spatial structure of immigrant segregation through the study of Gerani (Figure 1); an ethnically mixed district located at the heart of Athens, whose active immigrant economic activity makes the structure of the existing

immigrant networks revealing. It will examine the way in which space shapes the development of patterns of immigrant segregation by combining spatial analysis with primary ethnographic research, aiming for a holistic view of immigrant segregation.

The paper starts by establishing Gerani's spatial properties in terms of building morphology and street grid configuration through space syntax analysis and continues with the observation of immigrant economic networks. It also presents data on built form and land use, all of which were undertaken by the first author during the summer of 2014. The above analyses are combined qualitatively and quantitatively, through statistical analysis, revealing the socio-spatial structure of the immigrant quarter of Gerani. The paper shows that urban morphology and spatial configuration relate to the structure of the local immigrant networks offering immigrants protection and controlled intermingling with the native society. Despite the supposed homogeneity of Gerani's "ghetto", the various ethnic groups appear clustered in the area while an internal rationale emerges; the more integrated groups in the Greek society appear to occupy locations closer to main attractors and characterised by higher potential of "natural movement" (Hillier, 1996).

2. The case of Gerani

Gerani is located at the heart of Athens, which is characterised by the highest immigrant density within Greece, and is chosen as the case study of this research for several reasons.

Firstly, typical of many immigrant districts around world, it is situated in close proximity to the main transportation hub of Omonia Sq. and at the edge of the street that has formed a boundary that separates the economically developed eastern parts of the city from the western deprived but cheaper parts. History also shows that immigrants tend to cluster at the borders of the economic core of cities, allowing them to take advantage of economic vibrancy and low land values simultaneously (Carter, 1983).

Secondly, the area has functioned for many years as a transition zone for newly coming immigrants, which raises questions whether there are any spatial factors encouraging this phenomenon. Until the 1970's Gerani was the point of first arrival for internal migrants. Today Gerani serves the same role for immigrants to the country, hosting them until they find their feet economically, after which they either move elsewhere in the city or to other European countries. Gerani is today the most active and multi-ethnic immigrant hub of Athens; making it a useful case for studying the structure of immigrant settlement. According to the most recent population data, the area comprises mainly groups from Greece, China, Pakistan, Bangladesh, East and Central Europe, the detail of which follows below.

Gerani also reflects the recent socioeconomic transformation of Athens, which has undergone a parallel process of suburbanisation with a gradual shrinkage of its economic centre. This process precedes the arrival of immigrants to the area and it is evident that it had already started to become abandoned several years before the most recent waves of immigrant settlement in the district.

Gerani's building stock is quite typical for the centre of Athens. It is mainly comprised of densely built office buildings, the commercial version of the standard residential "polikatikia", a type built widely across the city between 1960 and 1980. The typology of "polikatikia" is characterised by a solid rectilinear building with peripheral balcony zones built on reinforced concrete frames. It is seen as a direct translation of Le Corbusier's "Maison Domino" (Giudici & Issaia, 2012). Combined with the mechanism of "antiparochi", a law that permitted landowners to swap land area for building rights, Athens has developed bottom-up, with a certain degree of informality in the way in which developments are erected on site. This informality in the construction process creates an opportunity to study spontaneous patterns of social, economic and spatial self-organisation.

3. Spatial configuration and urban morphology

3.1. Spatial configuration evolution

The analysis of Gerani's spatial configuration starts by examining its historical evolution. Until 1821 Athens was organically developed around the hill Acropolis. The first master-plan was proposed in 1833 by the Bavarian architects Kleanthe and Schaubert, who designed the "historical triangle" marked by Piraeus Ave., Panepistimiou Ave. and Ermou St. and was characterised by symmetry and wide boulevards (Figure 2).

The master-plan was implemented but modified, with the main east-west ceremonial axis being converted to a regular street, the western public squares being significantly reduced in size and the palaces being located at the eastern edge of it; laying possibly the ground for the subsequent east-west division of Athens.

Gerani was developed at the north-west edge of the triangle, in proximity to Omonia Sq. The triangular shape of the plan spearheaded the multidirectional development of Athens through different grids that intersect at the centre of Athens. Gerani is located today at the junction of five different grid systems, a factor that significantly reduces the cohesion of its street grid (Figure 3).

3.2. Space syntax analysis

In order to grasp the levels of natural movement within Gerani based on the theory and analytical tools of space syntax, the measures of integration and choice were calculated using Depthmap software (Varoudis, 2012). The axial map of Athens was based on the model provided by the Space Syntax Laboratory which was updated on the basis of fieldwork.

The axial analysis suggests that Patision Ave. is characterised by high global integration values (Figure 4) and Patision Ave. and Piraeus Ave. by high global choice values. According to the analysis of intelligibility - the correlation between axial connectivity and global integration, that indicates how readable the wider system is by its users (Hillier et al., 1987) - the main limits of Gerani, Athinas St. and Piraeus Ave., are characterised by low values. On the other hand, Patision Ave., the main axis that crosses the east symmetrical triangle to Gerani based on the axis of Athinas St., has the highest intelligibility value within Athens. This happens because this long axis connects directly the more labyrinthine organic parts of the historic centre to the modern districts of Hippodamian street grid. Overall the eastern part of the historical triangle crossed by Patision Ave., unlike the west one, has significantly higher integration and choice values, which is reflected in the vibrancy and economic vitality of this part of the city.

The segment integration analysis for a radius of 1200m (Figure 5) - a scale related to both pedestrian and vehicular movement - suggests again the significance of Patision Ave. but also highlights the importance of Menandrou St., Evripidou St. and Sofokoleous St. The areas surrounding the City Hall and the Varvakios food market and the area around Diplarios School Sq. are the most segregated parts of Gerani.

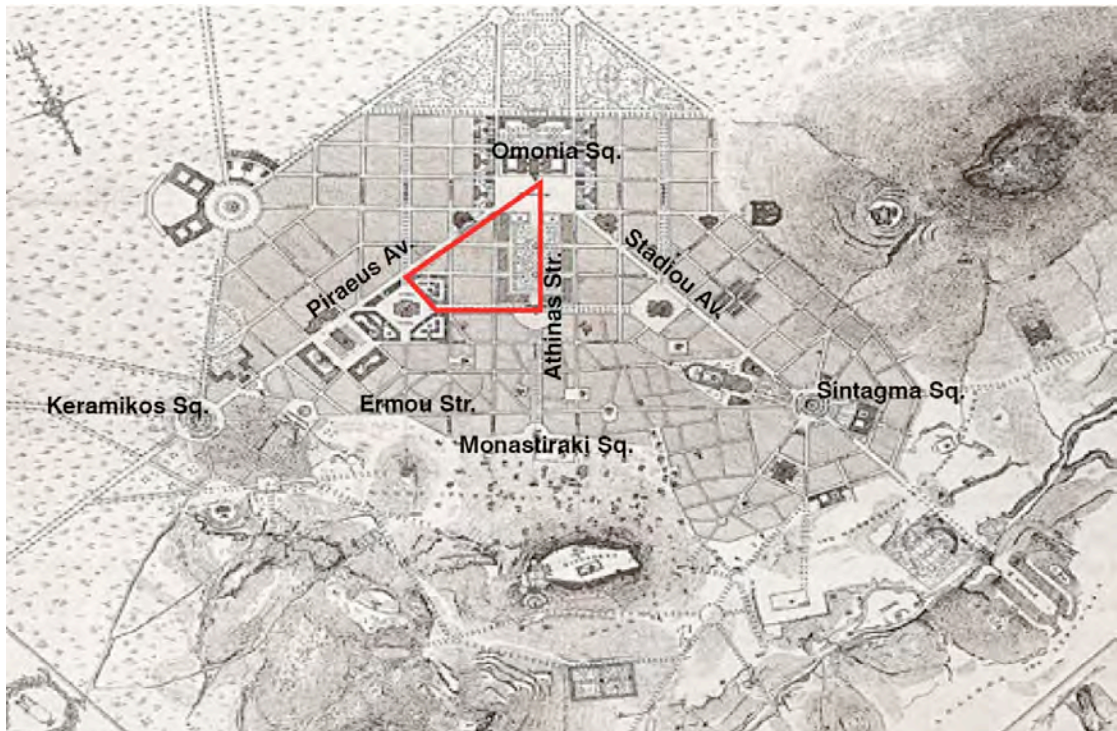


Figure 2: Kleanthes and Schaubert plan for Athens, 1833 (Papageorgiou-Venetas, 2001)

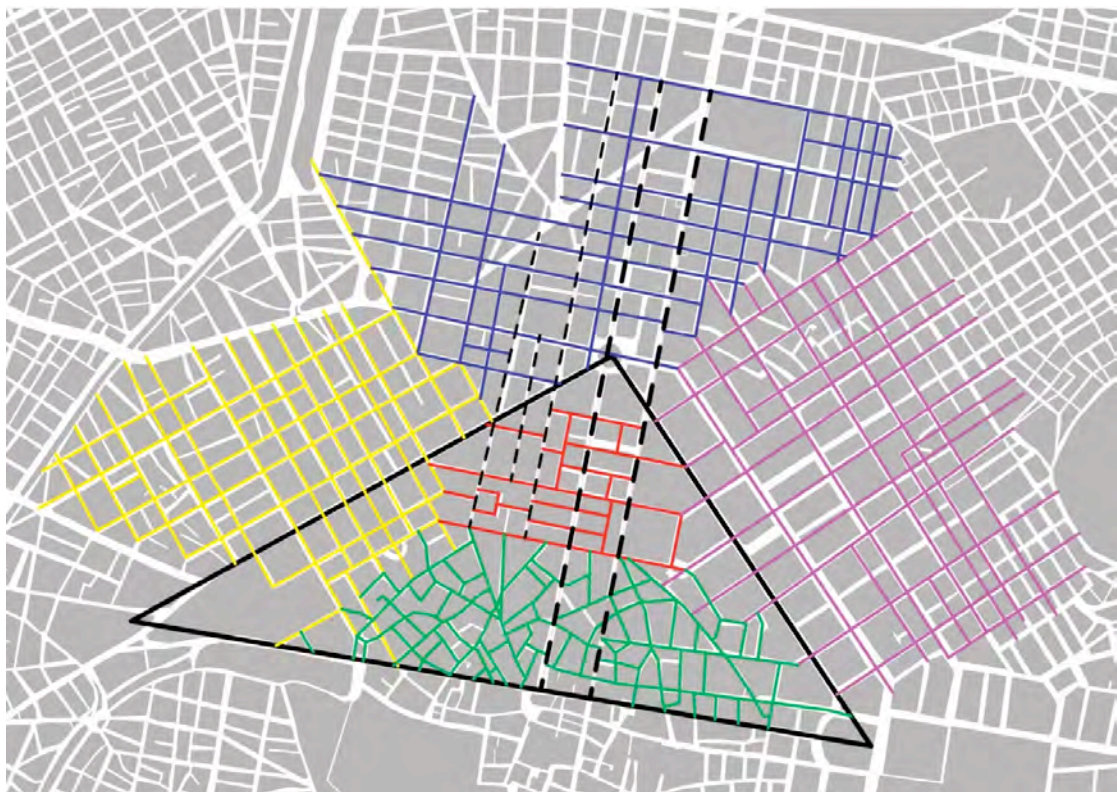


Figure 3: Gerani lying at the overlapping of five different grid systems



Figure 4: Global integration for axial analysis

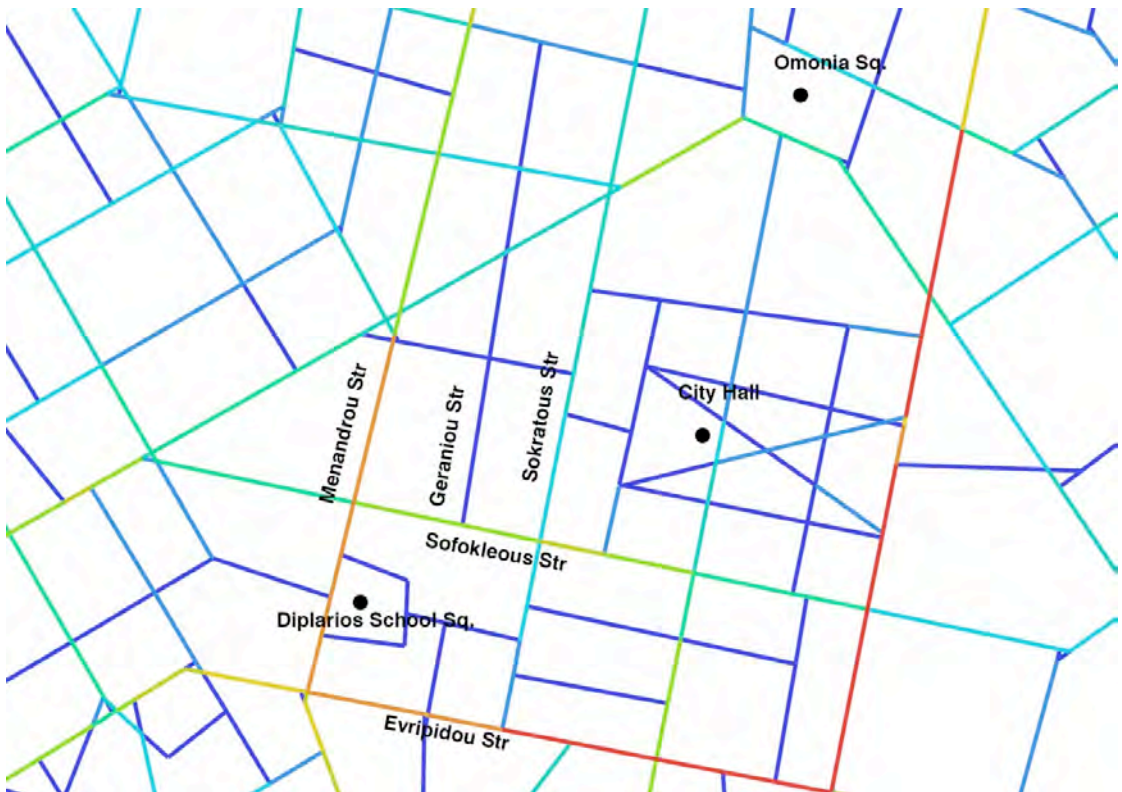


Figure 5: Integration R1200 for segment analysis

3.3. *Urban morphology*

Considering the width of the street network in the area, the street segments were classified in four categories, with only the streets bounding the area being wider than 10m. Whilst a couple of internal streets range from 6 to 10m, similar to neighbouring districts, most of Gerani's streets are less than 6m wide, with Geraniou St. and Diplari St. having a width of less than 4m. Evripidou St., the main border between Gerani and its neighbouring Psiri, forms an effective boundary beyond which vehicular movement cannot penetrate the district, diminishing further the levels of movement in the area.

Gerani has a mix of building typologies and heights. The tallest buildings rising to 7-8 floors are at the boundaries of the area, with its interstices constituted by low to medium rise buildings, ranging from 1 to 6 floors. As with street widths, it could be said that the high rise buildings at the boundaries of the area form a physical barrier that creates a sense of enclosure to the district. Whilst it is a barrier to movement between the district and its neighbours it does also create a protective edge for immigrant groups attempting to create their own points of reference within the centre of the city; in proximity to the host community's activities but separated from them.

Office buildings are over 51% of the building stock. Whilst constituting commercial adaptations of the housing typology of "polikatikia" described above, their limited number of openings, without the relief that the exterior balconies of this type would normally provide, makes them totally inappropriate for housing. Nevertheless, they have been adapted to a variety of uses and a recent study of the area (Theodorou et al., 2010) has described it as being vertically segregated, with the majority of office buildings hosting retail uses on the ground floors, illegal housing and storage spaces on intermediate floors, and Greek-owned offices and few residences on the upper floors, which are characterised by better ventilation and sunlight.

The typology of "polikatikia" allows for horizontal division of ownership with some cases of multiple owners, making any consent for change almost impossible, and consequently another cause for the area's development to be impeded (Theodorou et al., 2010).

Aside from its commercial incarnation, housing types of polikatikia appear in very low percentages, with the remaining 17% of buildings being neoclassical and of high architectural interest. Most of the latter have either been abandoned - often occupied by illegal residents - or have been bought by investors, locked up in anticipation of future gentrification in the area. Nevertheless, unlike its neighbouring Metaxourgio, Gerani has very little signs of gentrification, raising the question whether, in addition to the lack of appropriate building stock, there are spatial factors contributing to its ongoing deprivation.

4. **Patterns of immigrant appropriation of space**

4.1. *The economic life of Gerani*

Based on the mapping of ground floor uses that was conducted by the author, 28.2% of the local ground floor businesses are closed, reflecting the tendency of small scale businesses to abandon the area. The remaining active businesses were classified into ethnic groups using shop signs as indications of their main clientele and/or ownership: 59.6% of the businesses had Greek signs, 15.5% Chinese, 12.3% Pakistani, 8.3% Bangladeshi and 3% Central and East European signs.

Looking at broad land use types within Gerani, retail appears in highest densities in street segments with high choice values in the medium range from 2000 to 1200m and hotels and public services tend to be at the edges of the district which are characterised by high values of global choice. In contrast, manufacturing, workshops and storage spaces are located in the shortest and more segregated streets of the district.

Retail activities in the area include selling clothes and accessories, food - mainly around Varvakios food market -, cafes and restaurants, electronics and home accessories. It is notable, also, that in

Gerani many goods for sale are aimed at newly arrived immigrants: cheap hotels, travel agencies, money transfer agencies, luggage shops, mobile phone shops, and indeed some pawnshops. Furthermore, informal mosques and established immigrant organisations are located in the area.

Regarding the distribution of retail activities among the local ethnic groups (Figure 6), whilst Greek ownership covers the whole gamut of retail, other groups tend to specialisation. Chinese are almost exclusively focused in the retail and wholesale of clothes and home accessories, Pakistanis in the sale of electronics, luggage, food, ethnic restaurants, mini markets and barber shops, Bangladeshis in food shops, restaurants, electronics, luggage shops, barber shops, mini markets, money transfer and travel agencies, and Central and East Europeans in money transfer and travel agencies. Some premises are subdivided between retail outlets to reduce costs.

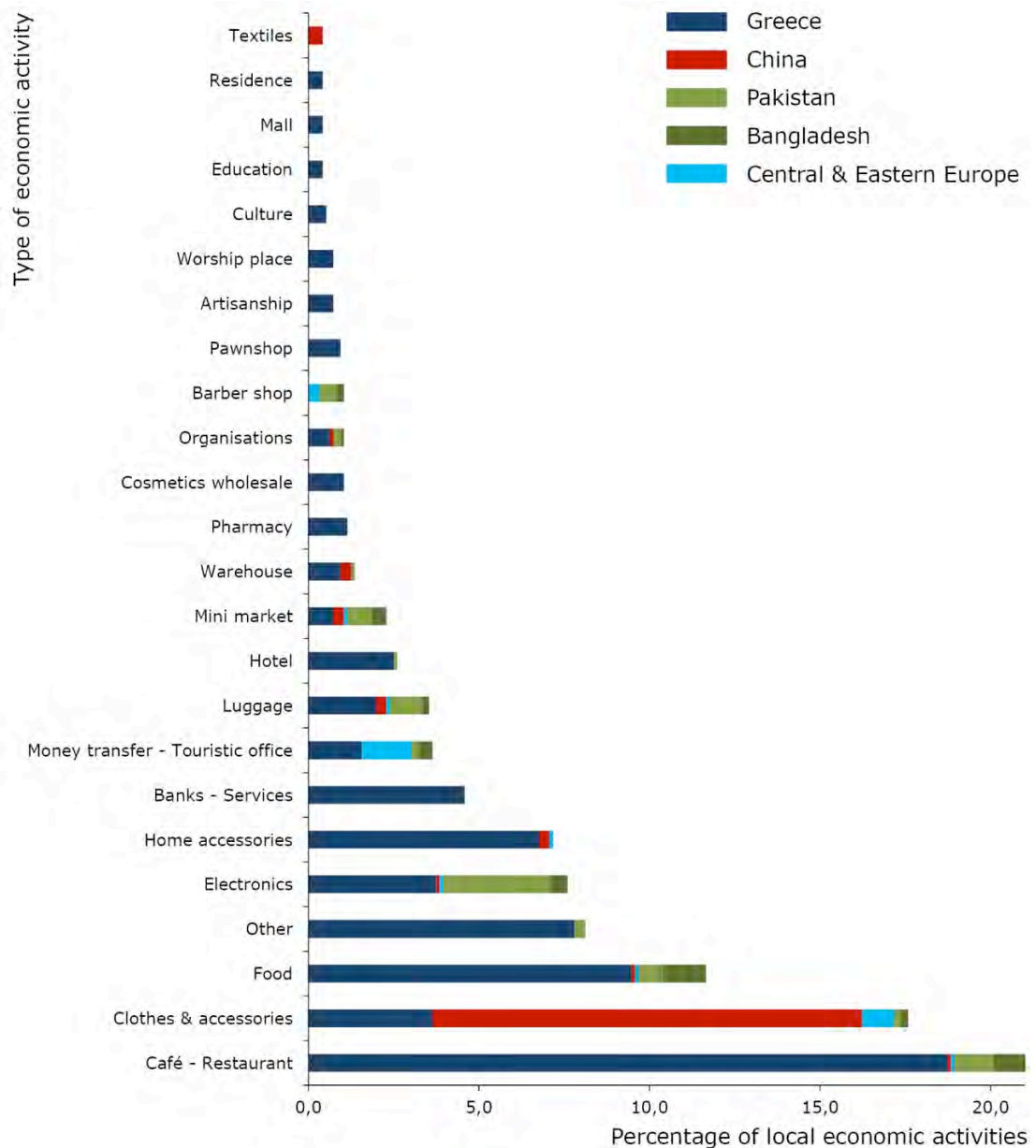


Figure 6: Economic activities related to the various ethnic groups

4.2 Deteriorated enclaves

Certain areas of Gerani have been completely abandoned by both native Greeks and immigrants, like the Diplarios School Sq. (Figure 7), and the rear section of Varvakios Sq. Whilst there are likely to be planning or ownership issues behind this fact, it is notable that these cases both suffer from a locally

fragmented street network that impedes movement through the area. Current research has shown that both Diplarios School Sq. and Varvakios Sq. also function today as enclaves of anomy, concentrating drug dealers and users, homeless, and being characterised by low feelings of safety (Theodorou et al., 2010; Tournikotis et al., 2012).

In order to explore the spatial characteristics of the closed businesses, we compared the spatial characteristics of the location of open and closed businesses. In the first instance, almost all scales of integration and choice were higher for open than for closed businesses. The tests then examined whether there was a statistically significant difference between the average space syntax values of the locations of open businesses in comparison with all businesses, although this was not a statistically significant difference. Finally, the tests examined whether there was a statistically significant difference between the average space syntax values of the locations of closed businesses in comparison with all businesses. For both choice and integration the significance value of the test was higher in the scales ranging from 2000 to 800m (two-tail t-text <.0001) and less significant in the case of both larger and very local scales (N and 400m). This finding indicates that functioning businesses tend to be on streets which benefit from movement on foot or public transport.



Figure 7: The abandoned Diplarios School Sq.

4.3 Distribution of immigrant businesses

Despite the fact that Gerani is popularly considered to be a uniformly immigrant “ghetto”, detailed observations of business ownership suggest the existence of an internal structure of ethnic clusters within it (Figures 8, 9, 10). Greeks were found to be located in the most profitable locations of the area, around Piraeus Ave. and Athinas St., but also in segments located one turning away from them, as suggested by the angular step depth analysis (Figures 11, 12), with their density gradually decreasing as one moves to the interior of the area (Figure 9). As described above, Piraeus Ave. is characterised by high levels of local and global integration and choice values.

However, as the hot-spot analysis that was conducted in the geographical statistical analysis (ArcGIS) suggests (Figure 10), Greeks are mainly clustered around Athinas St., which, although not

syntactically important, is one of the most economically active streets of Athens connecting the City Hall and the food market of Varvakios Sq.

Examining the hierarchy of average integration and choice values that correspond to the locations of the various groups, Greeks were in almost all scales located one step before the bottom of the hierarchy for both measures and close to the average values of all the street segments of the area (Table 1). This can be explained by their location around attractors characterised by high retail advantage but low syntactic values.

Chinese are the most recently arrived immigrant group and they move to Greece as families. Despite their lack of interaction with other ethnic groups, they systematically gain a better position in the Greek economy by successfully establishing their own commercial activity. This group is clustered around Koumoundourou Sq. (Figures 8, 9, 10) on Piraeus Ave. - a location visually distinct, very close to Omonia Sq. and characterised by high levels of natural movement. The dense network of hidden streets around the area offers cheap building stock abandoned by native Greeks, permitting the Chinese group to organise their business activities and store their goods. Chinese are consistently located in streets with above average space syntax values for the area (Table 1).

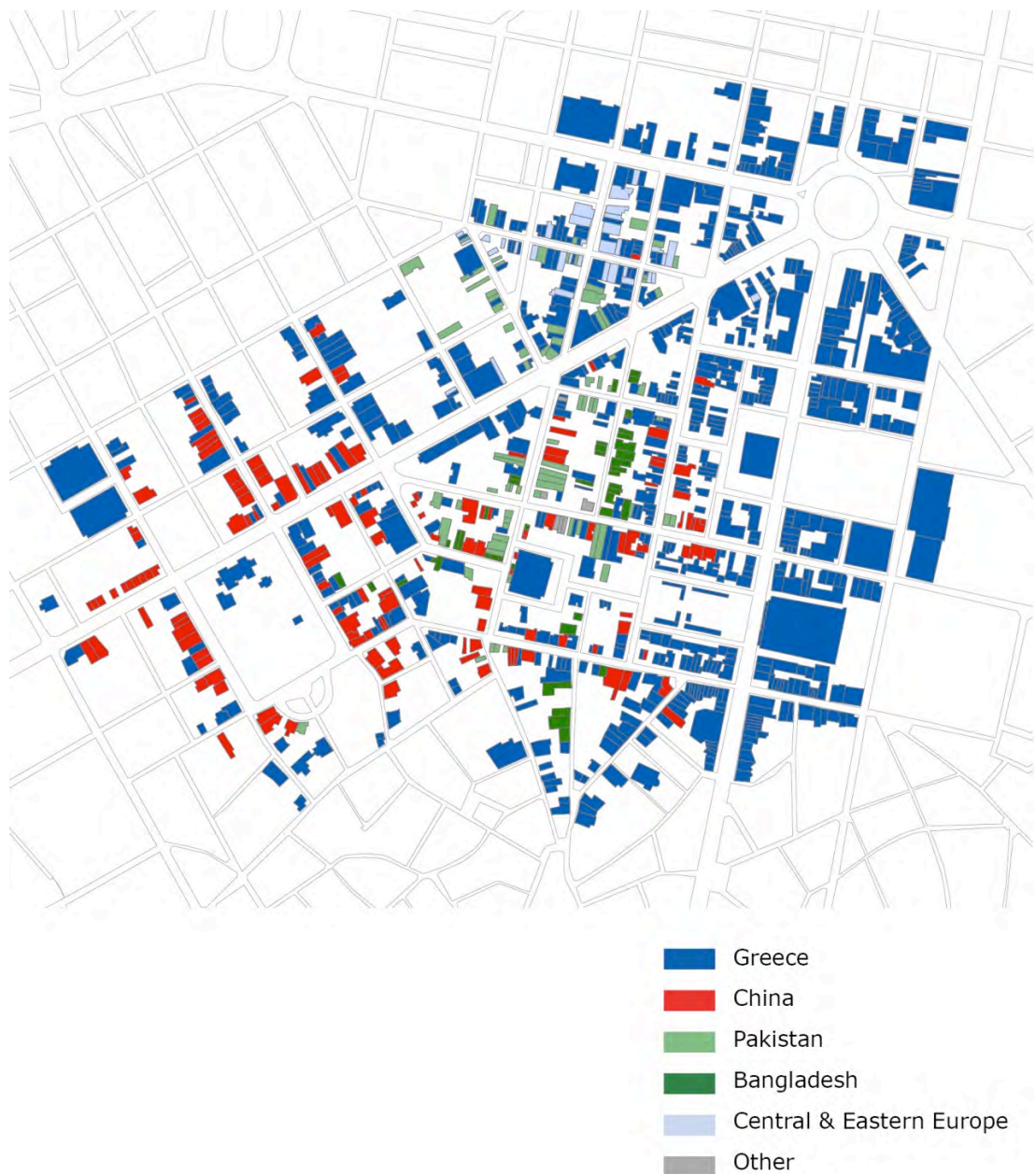


Figure 8: Distribution of ethnic groups in the area of Gerani based on business' signs

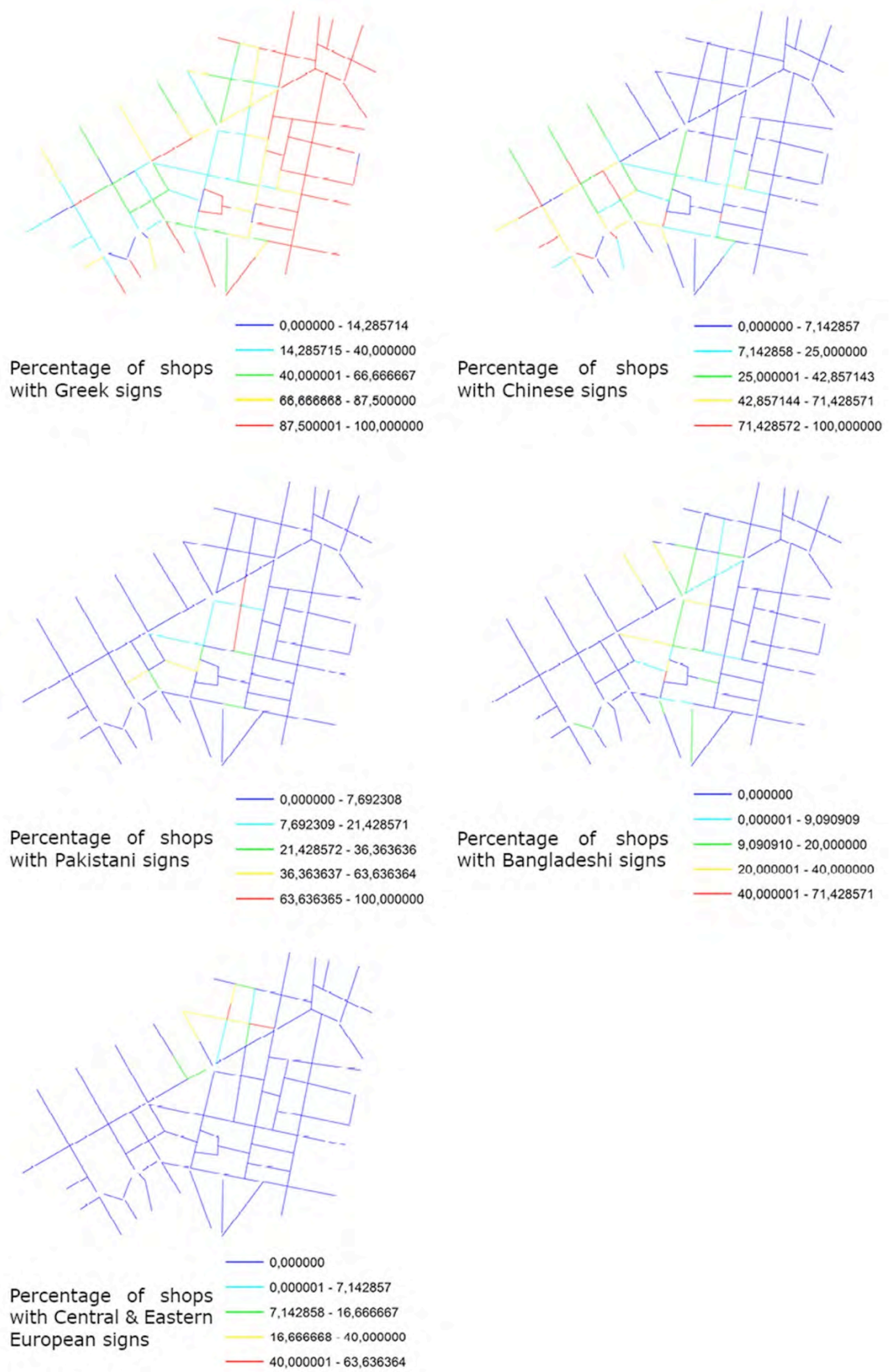


Figure 9: Density of the various ethnic groups per street segment (percentage of businesses of each group to the total number of businesses per segment)

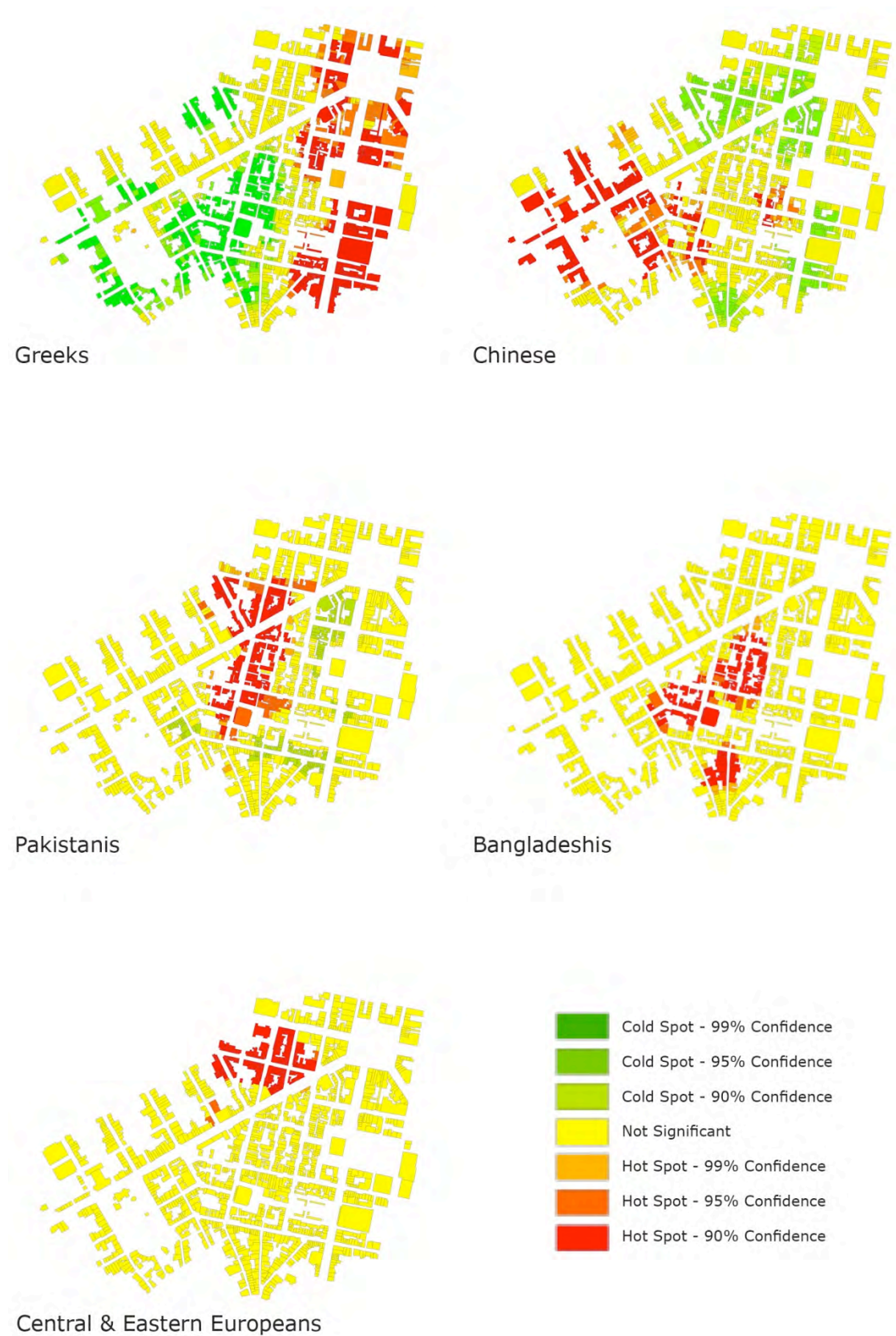


Figure 10: Clustering of the various local ethnic groups, based on ArcGIS Hot-Spot analysis



Figure 11: Angular step depth analysis starting from Athinas Str.



Figure 12: Angular step depth analysis starting from Piraeus Ave.

Ethnic group	Integration N	Integration 3000	Integration 2000
Central and Eastern Europe	118505504.15	741345.62	207269.87
China	87006543.26	606436.97	178551.55
Pakistan	51468201.74	566858.96	174777.35
Average area value	49713009.23	485248.31	147070.72
Greece	41470200.90	473375.97	146221.59
Bangladesh	3157588.54	183409.65	68657.30
Ethnic group	Choice 1200	Choice 800	Choice 400
China	42999.19	11970.00	1072.59
Pakistan	42334.35	11855.16	1054.34
Greece	34735.59	11150.52	1022.06
Average area value	34176.33	10570.34	1021.78
Central and Eastern Europe	32527.85	8392.09	891.82
Bangladesh	19227.05	6410.65	697.00

Ethnic group	Integration N	Integration 3000	Integration 2000
Pakistan	24613.46	3057.88	1698.54
Central and Eastern Europe	24297.72	2913.37	1608.58
China	23984.46	2830.51	1559.66
Greece	23695.97	2753.80	1504.05
Bangladesh	22752.93	2753.67	1496.63
Average area value	23687.83	2559.34	1408.33
Ethnic group	Integration 1200	Integration 800	Integration 400
Central and Eastern Europe	753.26	399.90	122.63
China	730.66	397.03	122.02
Pakistan	711.68	396.66	121.60
Average area value	678.04	376.13	119.84
Greece	673.09	375.42	118.25
Bangladesh	613.67	349.07	103.34

Table 1: Average values of space syntax measures corresponding to the businesses of each ethnic group

Central and Eastern Europeans were amongst the first to migrate to Greece in recent times and their educational credentials vary. They are balanced in terms of gender and follow an integration strategy of pursuing low profile jobs such as construction, industry, touristic and personal services. This group is almost exclusively located around Zinonos St. and Agiou Konstantinou Sq. (Figures 8, 9, 10), very close to Omonia Sq., an area which has undergone improvement of its public realm and consequently has more native Greeks than typical of Gerani overall. Being closer to the native culture and having lived in Athens for a longer time periods, this group is more integrated in Greek society. Furthermore, rather than exploiting its good location for retail, this group uses its cluster around Omonia Sq. mainly for socialising in cafes or to use the local money transfer and travel agencies. The proximity to Omonia Sq. means that Central and Eastern Europeans are situated in well-connected streets both for choice and integration and particularly for the medium to low scales (Table 1).

In contrast, immigrants originating from the Indian Peninsula (comprising primarily Bangladeshis and Pakistanis) constitute the most deprived immigrant group. This group is male dominated and constitutes “the most deprived group in terms of education, position in the labour market and living conditions” (Maloutas, 2007). Their integration prospects are challenged by their imbalanced gender constitution, their difficulty to learn the Greek language, but also because their culture is largely unknown in Greece. According to Tonchev (2007) their ethnic and religious status places them in a particularly disadvantageous position in the Greek society.

Pakistanis and Bangladeshis tend to cluster together (Figures 8, 9, 10), although there are some differences in their patterns of settlement. Pakistanis, the third group numerically in Gerani and with established activity in the area (Theodorou et al., 2010), are mainly clustered on and around Menandrou St. (Figure 13) where the Pakistani mosque is also located. This is a street of high levels of natural movement which, although deprived, feels vibrant, with a concentration of many ethnic Pakistani and to a lesser extent Bangladeshi restaurants that attract many immigrants and a few native Greeks. Furthermore, the cluster of Pakistanis is extended towards Piraeus Ave., mainly through shops selling electronic goods that are aimed at the general public and their spatial position is strong from a syntactic point of view (Table 1).

Bangladeshis, although situated close to Pakistanis and in some cases intermingling with them, are located in many of the remaining least advantageous enclaves of the system (Figures 8, 9, 10). They are mainly clustered on Geraniou St. and around Sapfous St. and Diplari St. - some of the narrowest streets in the area, where their informal mosques can also be found. The average values of the street segments related to their economic activities were found to be consistently at the bottom for integration and choice at all scales. These segments are hidden away and consequently remain unattractive for business activities – at least for those who have the means to settle in more profitable locations (Table 1).



Figure 13: Menandrou St.

Whilst clustering by ethnicity is characteristic of Gerani, there are some streets with high rates of diversity. The levels of ethnic diversity, (defined as the number of ethnic groups per street segment), were calculated for all the street segments of the area. Analysis of this feature found that streets with higher natural movement potential seemed to relate to higher levels of diversity. Specifically, greater levels of ethnic mixing appeared on Sofokleous St., Eiripidou St. and Menandrou St., while the ethnic clusters were generally located one turning away from them (Figure 14).



Figure 14: Ethnic diversity on Sofokleous St.



Figure 15: A typical arcade of Gerani

4.4 *The immigrant hinterland*

The analysis above mentioned the virtual abandonment of some streets within Gerani, leading to quite desolate back streets. Casual observation finds that whereas some streets have boarded up shops and businesses, in other instances there has been an appropriation of the back streets of the area for formal or informal economic purposes by the immigrants living locally. This is particularly the case in and around the local shopping arcades, which are the subject of discussion in this section.

Gerani's arcade network has a much more complex spatial structure compared with the symmetrical triangle of streets running off the axis of Athinas St. Notably, whilst Gerani's has 24 arcades streets, 19 of them are dead ends or lead to the heart of the blocks (Figure 15, 16). Their lack of connectivity means that they are poorly connected to the wider street network and, consequently, rather than intensifying movement within the area, they form barriers to local movement through the area as well as a deep sense of deprivation, given that most of the arcades have boarded or shuttered up shops. On the other hand, there is increased permeability resulting from the many gaps between the

buildings and due to the relatively unregulated building process of Gerani. The hearts of the building blocks currently contain a high number of illegally built structures, mainly used as storage spaces or illegal housing by immigrant groups (Figure 17) (Theodorou et al., 2010). The result is that the poorly integrated, but locally permeable open space of the district not only contributes to the area's sense of internal dislocation from the life of the city around it, but it also encourages antisocial, if not illegal activity to flourish out of sight.

To understand how these spaces function, a public space unjustified graph was constructed with its root being located on Piraeus Ave. in order to model the number of turnings needed to be taken from the main road to the most remote locations within Gerani. Open space was classified according to three categories: streets (taking each segment as a unit of analysis), arcades and internal block spaces (Figure 18).

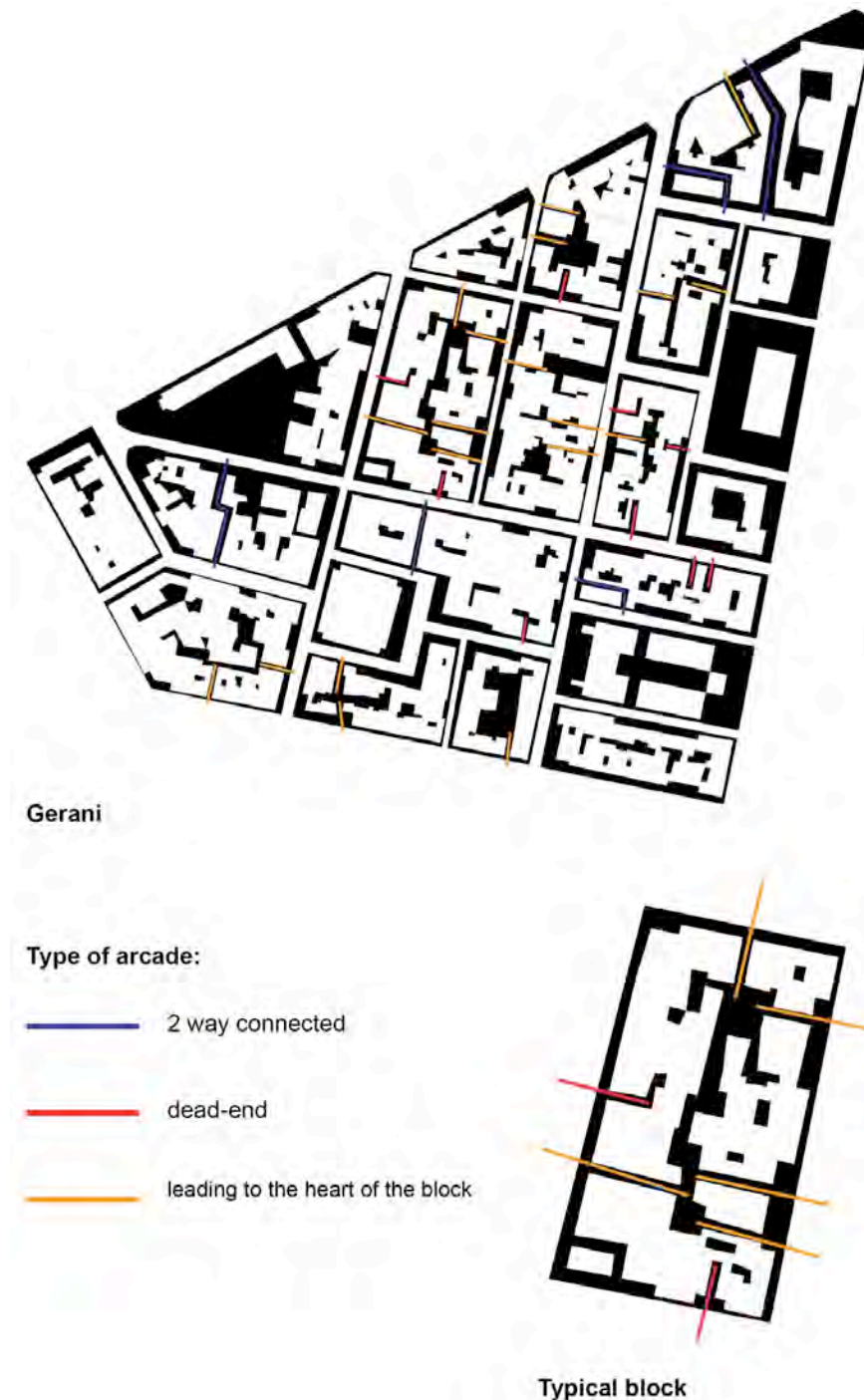


Figure 16: Typologies of Gerani's arcades



Figure 17: Mapping of illegally built common grounds (Theodorou et al., 2010)

A calculation of the A, B, C and D characteristics (Hillier & Tzortzi, 2006) – measuring the connectivity characteristics of Gerani’s public space - illustrates the problematic configuration of the arcade network in the area (Table 2), as can be seen in the corresponding justified graph, which illustrates the abundance and high depth of the internal block spaces (Figure 19).



Figure 18: Unjustified graph of Gerani’s open spaces

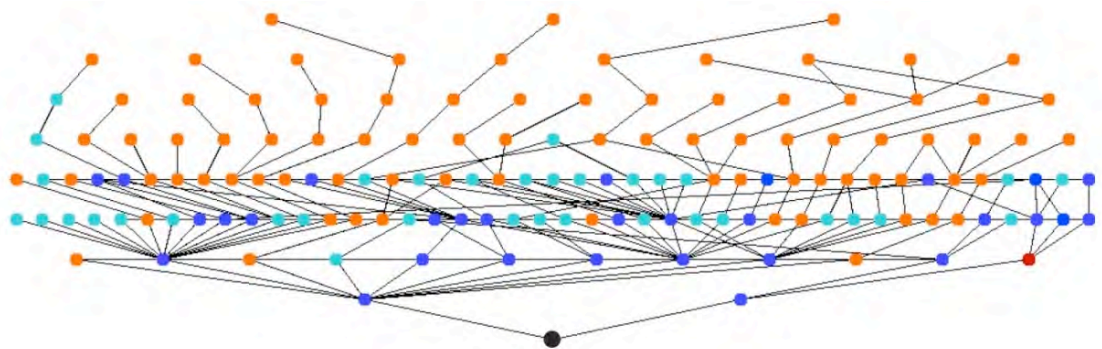


Figure 19: Justified graph in Gerani’s open spaces, starting from Piraeus Ave.

Level	Number of nodes	A space	B space	C space	D space	Total
9	3	3	0	0	0	3
8	10	6	4	0	0	10
7	15	7	8	0	0	15
6	23	5	15	3	0	23
5	41	11	5	25	0	41
4	42	6	7	26	3	42
3	12	0	0	5	7	12
2	2	0	0	1	1	2
1	1	0	1	0	0	1
Sum		38	40	60	11	149

Table 2: Number of A, B, C, D spaces corresponding to Gerani's open space justified graph¹

5. Discussion

The spatial analysis of Gerani suggests that its long-term deprivation might be related to the lack of cohesion of Gerani's street network due to its location at the intersection of five grid systems, the lack of intelligibility due to the absence of continuous axes that connect it with the neighbouring areas and the rest of the city, and the existence of many short streets and dead ends. High levels of movement appear only at the edges of the area and in a handful of internal streets. Furthermore, the majority of Gerani's streets are narrow, while the adjacent district of Psiri - practically car-free - discourages vehicular movement in the area.

In terms of building stock, the high rise buildings at the limits of the area in contrast to the low rise buildings at the heart of it create a feeling of enclosure, probably providing the necessary intimacy and freedom to the newly arrived immigrants; the positive side of segregation, as cited by various researchers (Kerшен, 2004; Peach, 1996; Vaughan & Penn, 2006). Furthermore, the vast majority of Gerani's low quality office buildings, unsuitable for housing and belonging to multiple owners, may further explain the deprivation of the area and, consequently, the concentration of immigrant groups in the area. Notably, the existence of a local dense but inefficient arcade network has been shown to encourage the development of a hinterland that supports immigrant economic and social activities, mainly through providing illegal storage spaces and housing. These spatial characteristics, coupled with the lack of building stock suitable for housing, may be the reason that the area has not undergone the same gentrification process as its more permeable neighbours have had.

Like in most areas concentrating high immigrant densities, Gerani has been to a significant degree abandoned by native Greeks. Its high percentage of closed businesses and the existence of deteriorated enclaves seem to relate to low levels of natural movement, limited access and visibility due to both the configuration of street grid and insufficient design of public spaces. It seems that Gerani has a dual spatial function in creating a place of separation within the city centre that operates both vertically and horizontally, which we term "successional segregation". It segregates vertically by layering ground floor retail, with illegal immigrant housing, storage or production spaces above, and finally the upper floors (with their better sunlight and ventilation) for native Greek offices or residences (Theodorou et al., 2010). It also segregates horizontally, starting from the outer edge inwards: with mixed use and ethnically diverse streets, then single-group streets clustered in less integrated areas (with differences between groups according to their immigrant life-stage), moving to arcades that host retail, storage spaces or are empty, and finally to the heart of the building blocks, with their illegal structures.

The study of local immigrant economic life showed that immigrants tend to specialise much more in economic activity when compared to native Greeks, while the most deprived groups often co-locate

¹ Within a justified graph, spaces with a single link are called A spaces, B spaces have two or more connections, C spaces have two or more connections and are part of a ring, while D spaces have three connections or more and lie at the intersection of at least two rings.

their businesses, increasing their possible clientele and reducing costs. The latter phenomenon has, interestingly, been identified as a particular feature of ethnically diverse streets in London (Hall, 2013). Despite the supposed homogeneity of the “ghetto” of Gerani, the various ethnic groups appeared clustered in the area in terms of economic activities and use of the public realm. Greater levels of ethnic diversity appeared in streets with higher levels of natural movement, while the ethnic clusters were located a turn away from them. Furthermore, a hierarchy was observed relating the degree of integration of the various groups in the Greek society to their location in the system of Gerani. Although this hierarchy was not always consistent to the space syntax values associated to the location of each group, it seemed that on the whole the most integrated groups would cluster in the more profitable locations in terms of levels of natural movement, attractors, quality of building stock and public space.

The classic example of this is the c. 1890 Hull-House maps which captured statistics on the people inhabiting the streets around the Halstead Street “ghetto” of Chicago. The colour-coded maps of city blocks according to ethnic composition show in great graphic detail how the settlement patterns by people from different countries form a coloured tapestry². As in Chicago over a century ago, each ethnic group has a differing degree of spatial privilege within the street network and the spatial positioning as well as the degree of mixing can be attributed to the immigration stage of each of the groups. We have shown that whilst the Bangladeshis are situated in the most hidden, spatially segregated streets of Gerani, the Central and Eastern Europeans, who benefit from having been in the country longer and from having greater opportunity for social and economic integration, are situated in close proximity to the points of spatial integration with the city at large. These findings are an indication of a tendency to clustering by country of origin in initial stages of migration. Whilst spatial configuration is unlikely to be driving the process of integration on its own, it is still reasonable to assume that the logic of the movement economy supported by the street network (Hillier, 1996) is utilised by those with the economic, cultural and social capacity to do so. That fact that the clustering by group coincides with greater diversity on the main streets may be further supporting evidence for there being a social integration process taking place in which the final stage towards economic integration within the city is an intermingling of people from different backgrounds close to the city’s main thoroughfare. It is also reasonable to say that these more diverse streets may be simply the result of greater competition for business in more economically viable locations.

These findings confirm the process described by Vaughan (2007) in which immigrants typically follow a spatial process of initial clustering followed by relocation to more spatially advantageous locations as an individual’s status is consolidated. The earlier research has proposed that relative spatial segregation and clustering permits immigrants to develop their commercial activity and create networks of mutual economic support that enhance their gradual integration in the host society. In conclusion, despite the fact that the crucial issue of immigrant segregation remains a political issue that premises the adoption of long term external and internal policies, the current study reveals that specific spatial structures and principles might be related to the creation and support of immigrant socioeconomic networks.

This study supports the argument that studying immigrant settlement patterns needs to take account of patterns of commercial activity and use of public space, especially when they arise under a status quo of informality and illegality. Evidently, relying purely on institutional data and approaches does not give a sufficiently detailed picture. Furthermore, the project highlights the role of the market as a means towards social mixing and inclusion. Especially in a country where feelings of xenophobia are on the increase and state policies remain insufficient in handling of large-scale immigration when the economy is on the downturn, understanding the informal fine-grain of every day ethnic intermingling that takes place in the public realm could be of great value towards re-establishing social balance.

² The map was part of a statistical study carried out by a settlement of researchers who were the precursor to the famous Chicago school of sociology.

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