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RESEARCH ARTICLE

EXPLORING THE ECONOMIC IMPACT OF THE SEASIDE URBAN REGENERATION ON SURROUNDING COMMERCIAL VALUES IN THESSALONIKI, GREECE

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Abstract

Urban regeneration projects, which aim at land redevelopment and land use changes, place a huge impact on the quality of urban environment. Apart from their environmental and aesthetic impact, their positive effects have an economic scale as well. The economic activity of an urban area can be affected by such projects through the increase in the frequency of visits, the consumption due to this increase and the change in real estate values. In particular, commercial values can be affected at a great extent, as the increase in the popularity of an area leads to an increase in revenues and, therefore, increases the demand for commercial properties. This paper examines the economic impact of the seaside urban regeneration, known as “NeaParalia”, on surrounding commercial values in Thessaloniki, Greece, with the use of hedonic modelling and geographically weighted regression. Findings indicate that, in general, the impact of the seaside regeneration is positive on the demand for commercial uses and on commercial values especially of properties with high proximity to it. However, the impact of variables as criminality and apprehension of the true benefits of regenerated urban areas continue to play an important role. It is worth mentioning that the impact of the regeneration is both reflected on the change in commercial values and the willingness to pay by professionals for the maintenance of the area.

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Introduction:-

Urban areas face numerous challenges due to population growth, climatic changes, resource needs and global economic restructuring. Structured urban areas have taken their form a long time ago, making it even more difficult to accept new environmental and planning initiatives. The post War period was characterized by the first large scale urban regenerations simultaneously in many countries, as destroyed cities needed to be redesigned. Simple urban renewal practices started to give their place to interventions with emphasis on environmental planning and targeted urban regeneration of specific areas (Hobbs, 1992; Hoch, 2002; Fung Chan, 2005; FilipovičHrast and Dekker, 2009; Grazuleviciute-Vileniske and Urbonas, 2014; Pavel and Jucu, 2019). However, despite the acknowledgement of the

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imperative need for sustainable urban planning, little co-ordination has been observed between urban planning and sustainable urban regeneration, mainly due to the emphasis given on economic development against urban sustainability (Couch and Dennemann, 2000; Hartog, 2002; Winker, 2009; Garcia-Ayllon, 2018).

Greek cities have started to take their form at the period of intense urbanization during the 1970s-1980s. At that time, urban planning mainly focused on housing the growing population without taking into account basic principles of integrated planning, let alone the environmental dimension of planning. This led to the decrease of open and green spaces, replacing them with concrete to meet the growing housing needs of the population and of the third sector. Nowadays, urban regeneration projects have come to fill the gap between the need for environmental planning and the inability of redesigning urban areas from scratch. Urban regeneration projects or urban renewal projects are introducing interventions in specific parts of the urban area which mainly include interventions in both public and private structured and unstructured space and the creation of open and green spaces (Slaev, 2016; Ministry of Environment and Energy, 2020). This problem is the main issue that major global cities face, among which is Thessaloniki, the second largest city of Greece, located in Macedonia, Northern Greece.

One of the major indicators for possible need for urban regeneration is property development which, at the same time, is interdependent with such initiatives. Intense construction activity for private properties increases the population of an area, but, at the same time, makes the need for environmental design of public areas even more imperative. London has been such a case. The revitalization of many areas came with the intense construction activity due to the conversion of industrial and commercial building stock to housing, together with new-build or in-fill gentrification. At the same time, it became clear that a common urban regeneration strategy for open spaces was needed as well (Keddie and Tonkiss, 2010). However, there are various cases that property development follows urban regeneration projects. Hong Kong, Seoul and even neighborhoods as Salford (Manchester) and Newcastle (England) renewal plans prove that initiatives for urban regeneration can influence property development and property values (Ha, 2004; Kirkman et. al., 2010; Turcu, 2012; Zheng et al., 2015; Deng et al., 2018; Huang et al., 2020).

This paper examines the interaction between urban regeneration projects and commercial property values. It focuses on the effect of the largest urban regeneration project of Thessaloniki on commercial values through the use of hedonic modelling with ordinary least squares (OLS) and geographically weighted regression (GWR) methodologies. Its objective is to highlight whether these projects have any impact on commercial values, the spatial distribution of this impact and the professionals' acceptance-willingness to maintain regenerated urban areas at a good condition.

Theoretical approach

The interaction of the natural and manmade environment shapes the local conditions and the microenvironment of each area. In the case of cities, this interaction has an increased impact on people's lives. Oswald Spengler (1880-1936) expressed the view that man is a builder of cities and that he lives and develops within the cities he creates. When this historian and philosopher expressed this view, he certainly did not have in mind the current image of cities, where the interaction of urban and environmental factors with all areas of human activity becomes even more intense.

Considering that the redesign of the urban fabric is no longer possible, the need to protect, restore, reuse, create and maintain free spaces and green spaces becomes more urgent than ever. Urban regenerations are a valuable tool towards this direction.

Urban regenerations or renewals are interventions in specific parts of the urban fabric which include alterations on free public spaces or interventions in both public and private structured and unstructured space. Regenerations aim at:

1. The protection of the environment.
2. The improvement of the functionality of the urban space.
3. Improving urban mobility.
4. Increasing economic activity (commercial, real estate etc.)
5. Strengthening social cohesion and reducing social tensions.
6. The creation of conditions for the increase of entrepreneurship and the prevention of the abandonment of areas by the permanent residents.

7. The improvement of the aesthetic beauty of the urban space.
8. Improving housing conditions and meeting the housing needs of vulnerable groups.
9. The economy in construction.
10. Adherence to strict participatory procedures during planning.
11. The rational management of free public space (Ministry of Environment & Energy, 2020)

The structure of Greek cities was formed during the period of intense urbanization of 1970-1990. Urban planning at that time had as its main goal the installation of the growing population without taking into account basic principles of integrated urban planning, nor the environmental dimension of the design. This has led to the reduction of free urban spaces and the minimization of urban green spaces, replacing them with concrete and asphalt in order to meet the growing housing needs of the population and the tertiary sector.

The current image of urban cities and especially of their historic centers is characterized by densely built environment, traffic congestion, air pollution and the widespread use of materials which minimizing urban greenery, ventilation and air purification of passages. Green spaces, open spaces, squares and all open urban spaces occupy a limited area, reducing their positive effects on the microclimate, the sense of comfort of citizens and the economic life of the region.

The theoretical framework is based on the interaction between the urban, environmental and social context with the real estate context. The urban and environmental approach focuses on how certain factors, such as urban green, regeneration changes, aesthetic beauty, parking issues etc., affect real estate values. The social approach focuses on how socioeconomic factors, such as education, age, sex, income, economic activity etc., affect urban regeneration acceptance. However, a main concern is to isolate these elements as much as possible from the macroeconomic forces that can affect them. This article adopts such integrated variables to analyze the effect of a large urban seaside regeneration on real estate values.

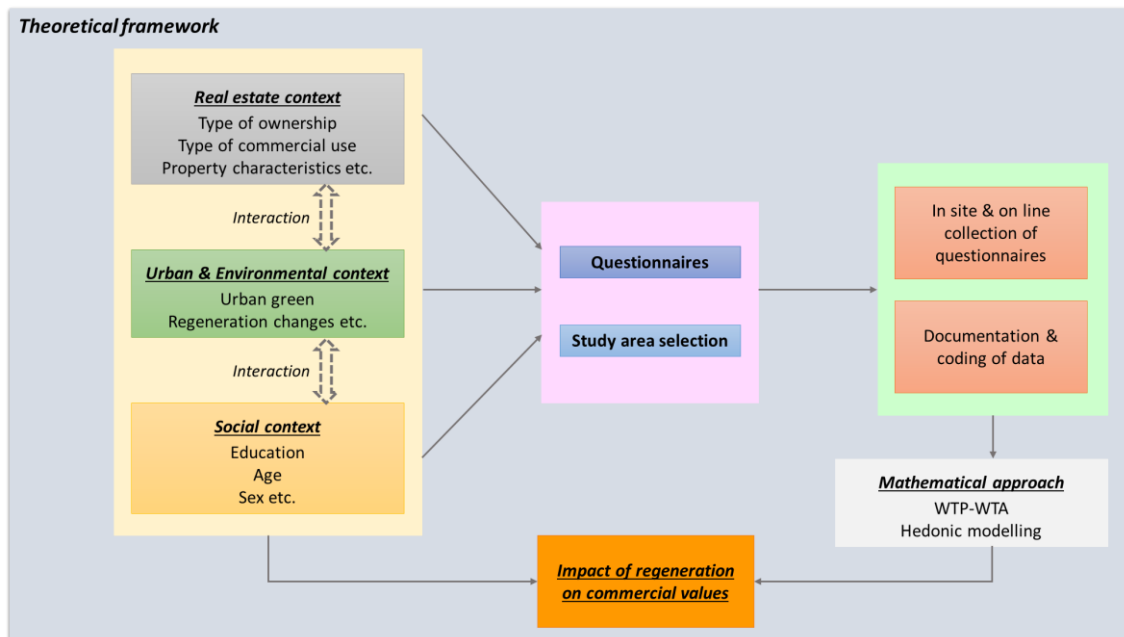


Figure 1:- Theoretical framework.

According to the framework, real estate values depend on the real estate context of the regenerated areas. After the Olympic games of Barcelona in 1992, all regenerations for the Olympics in the seaside area were combined with new walking routes connecting monuments and cultural activities, which lead to the increase in commercial leases and entertainment-leisure spaces. The same changes both in freehold and leasehold properties were documented in the seaside zone of Tagos, Lisbon. (Remesar, 2002; Pereira and Nofre, 2011; Daamen and Vries, 2013). On the other hand, urban and environmental context also plays a crucial role in influencing real estate values and demand. Variables such as urban green, aesthetics of the area, increased safety and attractiveness, affect the quality of life and

well-being of citizens, change the social structure of neighborhoods and alter the economic activity of such areas (Rigolon et al., 2020; Black and Richards, 2020; Jin et al., 2021). Even in areas where economic development and social stability is at a primary stage, such as Lagos and Osogbo of Nigeria, it has been proven that urban regenerations affect commercial leases and land values at the same extent as residential values. The real estate economic activity is influenced during (increase in demand for commercial spaces near the construction site) and after their completion (increase in attractiveness of the area's commercial and residential spaces) (Alaba, 2010; Noor et al., 2015; Ekemode, 2019).

Methodology:-

Study area

The “regeneration of the NeaParalia” is the project which ultimately changed the seaside area of the city of Thessaloniki. Thessaloniki is located in Macedonia in Northern Greece and is the second largest urban area in the country (Figure 2a). According to the census of 2011, the population of the urban area reaches 788,952 permanent inhabitants. Its natural borders are the sea at southwest and Chortiatis mountain at the northeast.

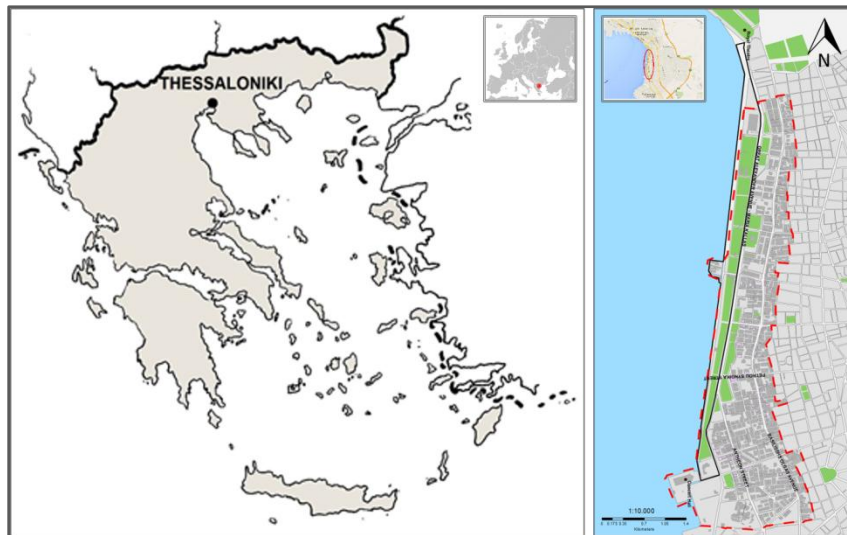


Figure 2:- a) Location of Thessaloniki in Greece (left), b) Study area (red line) and regeneration area of NeaParalia (black line).

The area of NeaParalia covers a large part of the seaside area of the city. The regeneration area covers a total area of more than 50,000 sqm from which 23,000 sqm are green spaces. It was completed in 2013 and received the International Award from the Union Internationale des Architectes (UIA). The regeneration aimed at the transformation of the beach front in an attractive place, linking various areas of the city, maintaining the linear path next to the open sea front and mixing entertainment spaces, education, culture, sport and walking. It is important to note that the design was based on the use of materials and construction ideas that allow disabled people to use the area. The study area is the broader area of NeaParalia, ranging from the regeneration up to approximately 800-1000 m. distance (Figure 2b).

The urban characteristics of the study area were mainly formed after the 60s due to the intense urbanization. NeaParalia is chosen due to its size, its range and the fact that services, cultural, commercial and residential uses are mixed in the area. The main land uses are residential and commercial, with commercial uses being located in the ground floor of the buildings. Offices are located mainly on Vasilissis Olgas Avenue, but are not the predominant use.

Property values vary along the area. In Maria Callas str. (extension of the seafront Alexander the Great Avenue) with predominant leisure and entertainment uses, leases range between 35–60€/sqm/month, whereas commercial yields on the seafront range between 7.5-8.5%. Commercial yields on Vasilissis Olgas avenue vary between 8-9%, slightly higher as the economic crisis moved preferences inside the historical center of Thessaloniki. Meanwhile, uses related to NeaParalia (pet shops, cycling stores etc.) increased their demand on the avenue. It is worth to

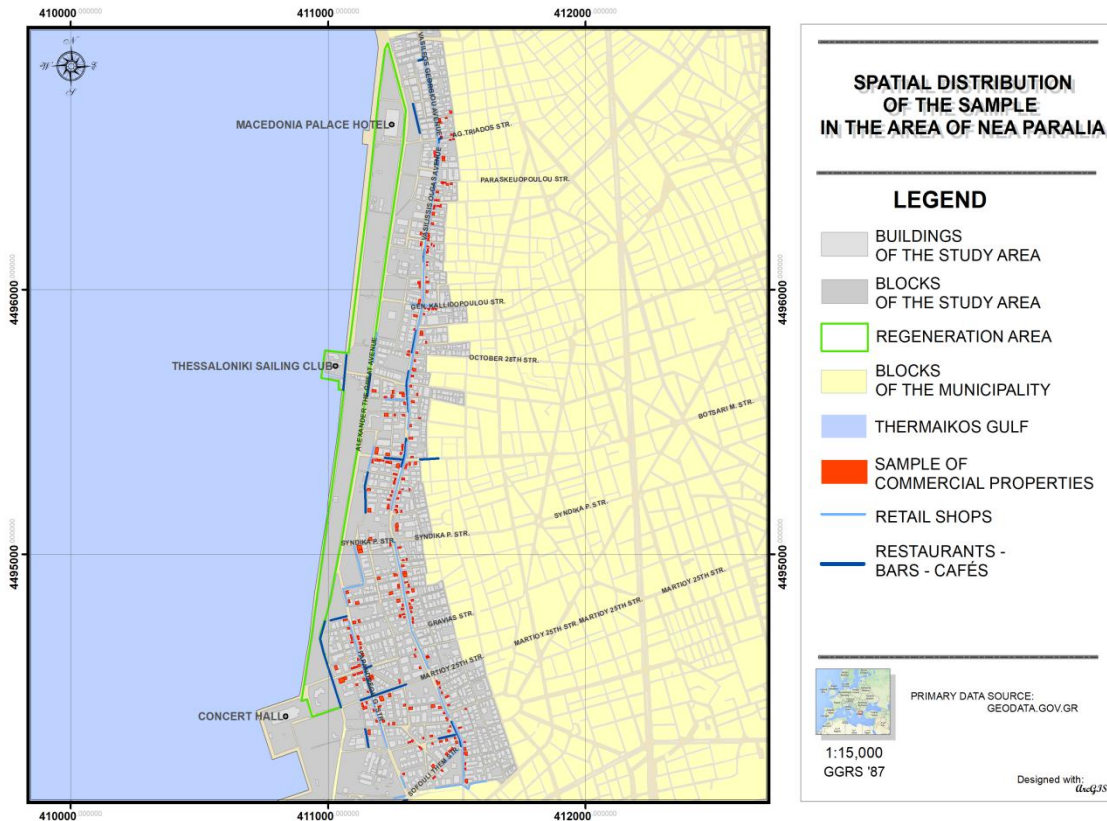
mention that, despite the destabilization of the real estate market due to the economic crisis, properties with direct sea view appear to have less fluctuations between the demanded and the final sale / lease value.

Methods, sample selection and data collection:-

Having chosen a study area that has never been previously analyzed in such way, a gap was, also, observed in the applied methodologies in Greece. Due to the fact that the Greek real estate market is a “closed” market in terms of available data, most studies on the impact of environmental and urban planning factors utilize methodologies, such as Willingness-To-Pay – Willingness-To-Accept (WTP-WTA), hedonic models etc., separately. In other words, while studies have been conducted on the Greek real estate sector, the use of internationally recognized methodologies, such as hedonic and geographically weighted regression models (Goodman, 1998; Fotheringham et al. 2002; Goodman and Thibodeau, 2003 Kuminoff et al., 2010), remains at an academic level.

This paper aims at the statistical analysis and spatial visualization of commercial property values due to the regeneration plan of NeaParalia through the combination of such methodologies. Particular emphasis is placed on statistical and spatial methods of assessment of the influence of renewal plans on values. Three methodological steps (ordinary least squares (OLS), spatial autocorrelation and geographically weighted regression (GWR)) are combined in order to identify any significant changes in commercial values as well as in the willingness to pay (WTP) of professionals towards sustaining the area at a good condition.

Specially designed questionnaires with the necessary information (urban, environmental, social factors, profile of professionals etc.) are created and distributed to professionals via live interviews and e-mails. This information formed 41 independent variables, which were categorized in 5 groups: economic, real estate characteristics, urban-environmental/impact of regeneration, social and spatial (Appendix). It is important to mention that the population of commercial properties included each and every commercial property of the area, amounting up to 2.780 properties. Vacant spaces were included as they remain a part of the population that will be affected by the regeneration in case of utilization. With a margin of error less than 7% and a level of significance of 95%, the collected sample amounted to 244, which was over the minimum required sample. The sample was equally distributed in the whole study area.



Map 1:- Spatial distribution of the sample of commercial properties within the study area.

The sample's profile is recorded along with the characteristics of each property, the impact of the regeneration (environmental sensitivity) on each professional and on commercial values (lease fluctuations, sale values, demand-supply changes etc.). Digitization and coding of the collected data, where necessary, was the next step.

The main analysis follows a defined structure beginning with a Hot-Spot analysis via Inverse Distance Weighted method, which captured the areas where similar values are gathered. OLS and GWR analysis followed afterwards in scope of incorporating the spatial interaction of the data. After ensuring the stability and accuracy of the models, through spatial autocorrelation and other tests, conclusions were drawn on the WTP of professionals and on commercial value changes.

It is worth to mention that it is the first time in Greece that a large-scale survey of the impact of environmental and urban changes on real estate values, with the use of statistical and spatial methods via two different software (IBM SPSS® and ESRI ArcGIS®) concerning a seaside renewal plan, constructed less than 10 years ago, in a large urban area in the country as subject of study is conducted.

Results and Discussion:-

The sample is distributed in 48% women and 52% men, with the majority (71.72%) being married with two children (35.66%). The larger part of the sample was 26-55 years old with high school and University education (63%). 59.02% of the professionals worked and lived within the study area. Almost all professionals (97%) were active in the area before the regeneration. One of the first indications that the regeneration project was successful is that apart from the fact that the project was completed during the worst years of the economic recession of Greece, only 4.40% stated that the turnover was slightly decreased and 11% that there was a decrease in new commercial activities. The popularity of the area is depicted in the frequency of visits. It is noteworthy that 70.08% stated that they visit the area more often after the regeneration and over 55% on a weekly or more frequent basis. Moreover, even if the area has a low crime rate, it is further decreased (18.13%), while the aesthetic beauty is clearly increased (90.11%). The only documented disadvantage of the project is the increase of parking problem, as, before the regeneration, a part of the seaside area was used as an open parking space for the surrounding residents and professionals.

As far as the size of the properties, more than half are small commercial businesses up to 60 sqm. with façade length up to 5 m. A percentage of almost 40% has a façade ranging between 6-10 m. and 70.90% a dept within the same range. Half of the properties are renovated and are made up of a main space with WC and a separately leased storage room nearby.

Leased properties reach over 70% of the sample with most lease periods beginning between 2005-2010. Leases range between 10-18 €/sqm. (excluding leisure-entertainment uses in Maria Callas str.) and yields between 7% - 8% depending on the size, façade, brand name and location. Professionals over 86% of the sample declared an increase in their lease up to 10%. Meanwhile, just over 9% declared an increase of 11%-15% and almost 4.6% an increase over 15% - mainly in shops very close to the regenerated area located on the junction of two streets.

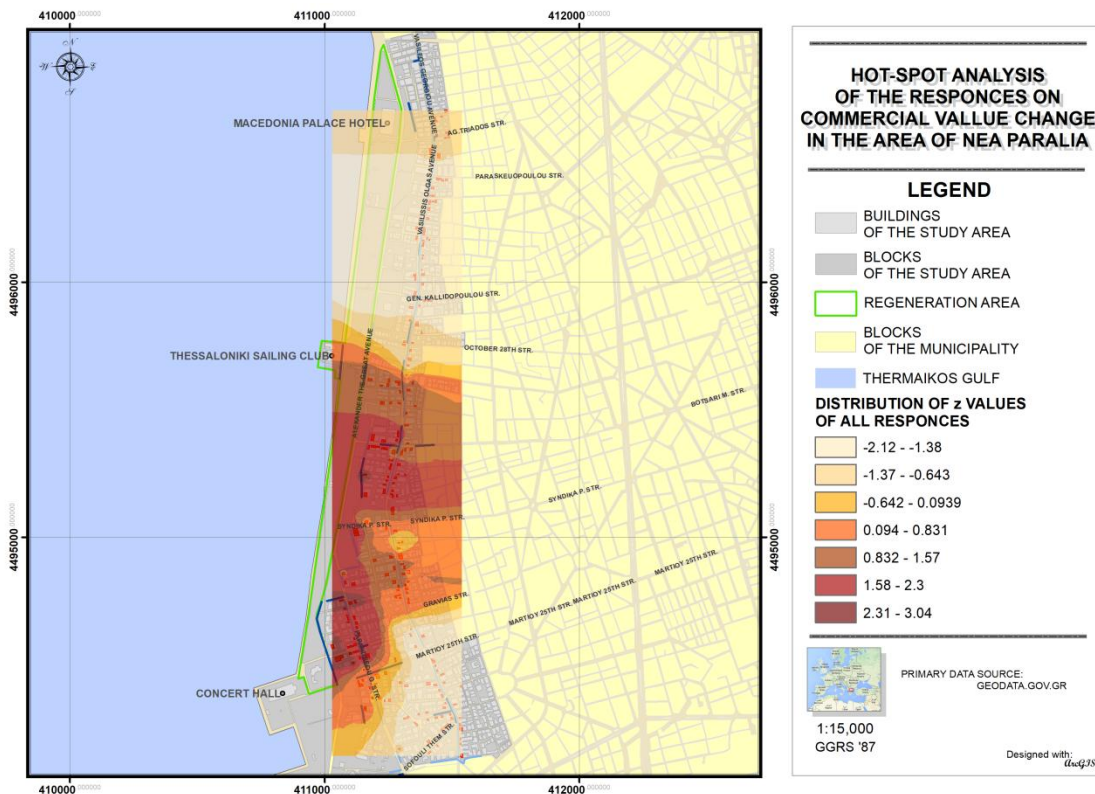
Regarding the WTP, a part of the sample stated their unwillingness to pay due to their belief that it is the municipality's obligation to retain the area at a good state and that they do not believe that the amount will be used for the regeneration. A percentage lower than 30% of those unwilling to pay stated that they cannot be charged with additional expenses in spite the fact that they welcome the regeneration and believe that it has changed the city's beauty and its citizens' habits. Positive WTP responses reached 1€ - 10€ per two months over 87%. It is noteworthy that 10% of the sample stated that they are willing to contribute with over 15€ per two months, with some stating particularly high amounts (up to 50€).

The areas with larger impact by the regeneration are initially shown through the Hot-Spot analysis by the results of Inverse Distance Weighted (IDW) method. The highest influence of the regeneration is seen in the areas where commercial activities are more closely concentrated.

It is observed that in the areas where commercial activities appear on the seafront, the influence of the regeneration is stopped by them and is not clearly recorded in the commercial areas of Vasilissis Olgas Avenue. On the contrary, where no activities are detected along the regeneration, its influence is reflected on the properties on the Avenue, especially those whose retail is related to activities within the regeneration (bicycle shops, pet shops etc.).

This observation is particularly interesting as it reveals that the direct influence of a regeneration is mainly reflected on properties with eye contact from it, regardless of the size or range of the regeneration.

On urban scale, the area of Syndika P. str.- Botsari M. str. offers the advantage of the large vertical streets that end at NeaParalia. Both roads are wide, creating easily accessible openings and views of the regeneration, resulting in citizens being attracted to the area even from more distant blocks. Respectively in the area of Papandreou G. str., the urban density is higher with small openings. However, the intense commercial activity with many restaurants, bars, cafés and the Concert Hall on Maria Calla str. in combination with the aesthetic beauty due to the regeneration enhances the attractiveness of the area and so higher demand and value changes are recorded.



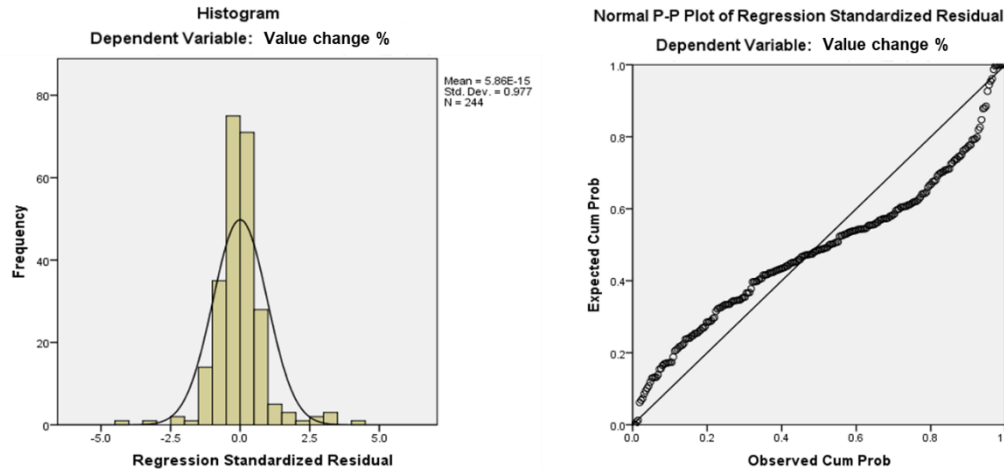
Map 2:- Hot-Spot analysis and IDW spatial display of the responses on commercial value change.

As mentioned before, the 41 independent variable were categorized in 5 groups: general (kind of ownership, amount of the WTP for the maintenance of the regeneration), urban (construction year, renovated/not renovated, size, floor, width of façade, depth, rooms, kitchen, WC, storage room, way of heating), socioeconomic (gender, marital status, children, age, education, residence area, profession, average monthly income (€)), spatial-environmental characteristics (distance from regeneration, distance from V.Olgas Avenue, distance from Alexander the Great-Maria Callas Avenues, distance from Antheon str., distance from NeaParalia's green spaces, distance from Royal Theatre's green spaces, distance from Egnatia's str. green spaces, distance from restaurant-bare-cafes and distance from other commercial spaces) and factors of influence by the regeneration (if the professional was active before the regeneration, consumption, crime, parking issues, aesthetical beauty, new commercial activities, increase in visits to the site, frequency of visits to the site, ownership of pet). The dependent variable in hedonic pricing with OLS and GWR is defined as the percentage change (%) of commercial values after the regeneration.

The analysis is conducted with a significance level equal to 5% as a criterion for the independent variables. Results on the accuracy and stability of the model are encouraging. The correlation of observed with the predicted values of the dependent variable reaches a 68.3%, whereas the adjusted R Square reaches 44.8%, revealing the predictability capacity of the model.

The significance of the listed variables is proven by t values, whereas indicators for the overall significance of the model, such as Joint Wald Statistic, are proven satisfactory. No outliers were found which in combination with the

examination of Cook’s Distance and Centered Leverage Value indicators of standardized DFFIT and Standardized DFBETA descriptive statistics tables, Mahalanobis distance, and t-tests prove no normality problems. Observing the corresponding indicators, the model is heterogeneous with residuals not normally distributed for a 95% significance level and a p-value of less than 0.05. Consequently, the importance of the Koenker (BP) statistic adds another element to the analysis. The model exhibits heteroscedasticity, which could be corrected with geographically weighted regression. In addition, the model as a whole can become more stable with GWR. Jarque-Bera Statistic records a slightly higher value than 0.05 and VIF and tolerance factors determine that residuals are normally distributed (Graph 1a and b) and that no important variable is missing.



Graph 1:- a) Histogram of standardized residuals normality, b) Normal P-P plot of standardized residuals.

Table 1:- Coefficients referring to the normality and stability of the model.

Akaike's Information Criterion (AICc)	-1120.001801		
Joint F-Statistic	6.069523	Prob(>F), (42,201) degrees of freedom	0.000000
Joint Wald Statistic	1137.455127	Prob(>chi-squared), (42) degrees of freedom	0.000000
Koenker (BP) Statistic	148.223764	Prob(>chi-squared), (42) degrees of freedom	0.000000
Jarque-Bera Statistic	1196.303057	Prob(>chi-squared), (2) degrees of freedom	0.051015

The model proved to be accurate as far as spatial autocorrelation is concerned with Moran’s I, p-value and z-score being within the limits of random distribution.

The indicators of GWR method determined a more stable and accurate model. The rate of variation of the dependent variable interpreted by the independent variables is 72.83%, a particularly significant percentage. The dependent variable can be interpreted by independent variables by almost 65%, i.e. almost 2/3 of the values of the dependent variable can be interpreted by the independent variables.

The validation of the methodology of analysis is reinforced by the AICc index, which, in this case, was decreased in comparison with the OLS method.

Table 2:- Results of Spatial autocorrelation and GWR analysis.

Spatial autocorrelation		
Moran’s I	-0.027078	
z-score	-0.757980	
p-value	0.448463	
GWR		

R Square	0.72827248883	
Adjusted R Square	0.64866188345	
AICc	-1030.91339700706	

A very interesting finding of the model is that the educational level does not go hand in hand with the change in commercial values. The negative correlation of the variable with value change is justified by the fact that professionals with up to secondary education responded at a very high rate that their properties recorded a remarkable change in values. In contrast, professionals with higher education were more restrained in their responses, with some declaring zero change in values, due to their more realistic understanding of the impact of the regeneration.

The expected result is the negative correlation of crime in the region. Reducing criminality through improved lighting and increased safety offered by the regeneration's increase in visits increases the changes in commercial values, as costs of any potential criminal or illegal activity are subsequently reduced.

The residence area seems to play a very important role in assessing the change in values. It is recorded that the residents who live in areas with characteristics similar to or even better than the regeneration (urban green, free spaces, lighting, etc.) tend to accept and evaluate economically the benefits of regeneration at a greater extent.

Two structural features of the properties are the size and any recent renovation. Both variables show a positive correlation with the dependent variable. The larger the size, the higher the impact rate of regeneration. In addition, if the property has been renovated, the change in its value is more noticeable. In areas where high positive percentages of value changes appear, businesses that require large properties in good condition predominantly exist. Therefore, large renovated properties in an area where almost all buildings were constructed during the 70s-80s tend to record higher demand and value change. Reduced costs for refurbishment, concentration of similar uses and attractiveness - popularity of the area drive demand and values upwards.

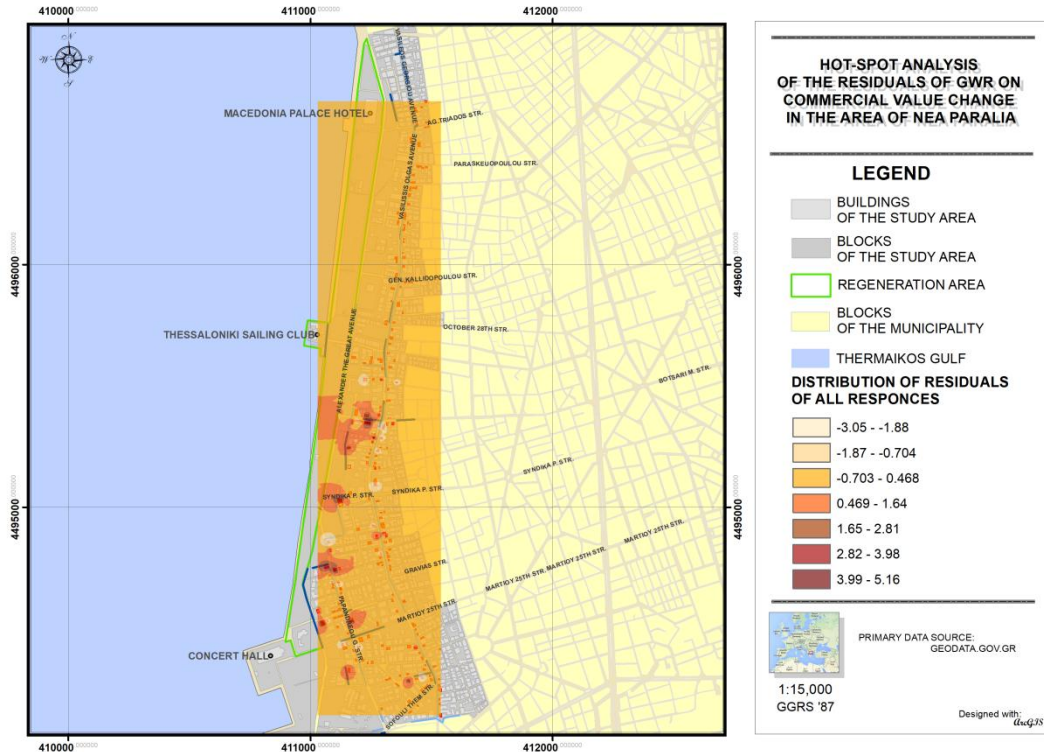
Two spatial urban variables that remained in the model are the distance from the green space of Papandreou G. str. and the distance from Alexander the Great Avenue. The distance from both roads increases the distance from the regeneration. As a result, the change in commercial values is negatively correlated, as the influence of regeneration gradually decreases up to 200 m. where it is almost eliminated.

Finally, professionals who declared positive WTP for the maintenance of the renovation stated, also, that their properties increased in value due to the regeneration. It is, therefore, clearly documented that their desire to retain the regeneration is reflected both in the amount of payment and in the positively accepted commercial value change.

As far as residuals are concerned, Hot-Spot analysis with IDW revealed only specific points of the seaside front documenting variations. The intersection of Maria Callas str. (extension of Alexander the Great Avenue) with Papandreou G. str., Botsari M. str. and Syndika P. str. are spots where professionals estimated value changes relatively high, in relation to changes estimated by the model itself, mainly due to their location and the concentration of similar uses. On the contrary, high negative values are developing vertically on the coastal front at the intersection of Vasilissis Olgas Avenue with Syndika P. str.

Different responses in combination with the special features of each area (e.g. direct sea view) led to the appearance of high residual values.

The coastal areas enjoy the existence of the urban greenery and the sea view which is clearly a comparative advantage. Overall, however, the deviations are very limited and the results of the model are satisfactory.



Map 3:- Hot-Spot analysis and IDW spatial display of the residuals on commercial value change.

Overall, it should be mentioned that the acceptance of the regeneration of NeaParalia was particularly positive by residents and professionals of all areas of Thessaloniki. The importance of similar urban and environmental interventions is reflected in the fact that NeaParalia is a new landmark for the city.

The commercial market in Greece has gone through the most difficult and unproductive period of the last 40 years struggling to maintain a share of economic activity. Nowadays, excluding the coronavirus era, the real estate market in Greece and Thessaloniki is under a significant upturn with foreign investments and domestic demands steadily increasing.

Especially, after the economic crisis, it has become clear that the revitalization of the real estate market is an interactive procedure which does not refer solely to economic parameters. Spatial, urban, structural and locational factors are affecting real estate values at a great extent and that is the reason for which regeneration projects can easily alter the market of an area.

Proximity

Spatially, the greater the proximity to the regeneration, the higher the effect is. The regeneration has a similar impact on professionals, who benefit from increased popularity and decreased criminality. Despite the low rates of criminality before the regeneration, an even larger rate decrease acts as a multiplier to professionals' WTP. Whether their areas of activity are located on Alexander the Great Avenue or on Vasilissis Olgas Avenue, the augmenting consumption - turnover increases both the financial ability and the desire to maintain the area that leads to this increase.

Related commercial activity

In particular, professionals with commercial activity directly related to regeneration activities (selling bicycles, pets, etc.) stated that they were willing to pay for its maintenance.

Age and shape of property

The study strongly clarified that the regeneration places increasing pressure on values, regardless of the age and shape of the property. NeaParalia created a network of green spaces of various activities that extend to the beginning

of the historic center of the city. This continuation has had a positive effect on values, as clearly stated in the interviews.

Concentration of commercial uses

The spatial distribution of changes in commercial values shows that concentration of commercial and leisure uses is likely to be more affected by a regeneration. Especially, commercial uses related to activities inside the regeneration are affected at an even greater extent. The concentration of commercial - entertainment – restaurant and bars activities near the Concert Hall and activities related to the regeneration on Syndika P. str. increased the consumption - turnover and the demand for real estate suitable for similar uses.

Spatial continuity

However, it must be mentioned that all commercial activities are separated by the regeneration by Alexander the Great Avenue and, therefore, during the construction of the regeneration they were not impacted very negatively. Their commercial activity was certainly decreased but stabilized at an extent due to the highly visited Vasilissis Olgas and Vasilios Georgiou Avenue. Were the commercial uses located on the regeneration, the results would definitely be different.

WTP for the regeneration's maintenance

It is noteworthy that professionals who are willing to pay a certain amount for the maintenance of a regeneration are more likely to have undergone a change in market or rental values. Even if the rental increase is translated in higher monthly expenses, the upturn in turnover over-covers any losses.

Conclusion and Recommendations:-

This paper examines the economic impact of the regeneration of “NeaParalia” on surrounding commercial values in Thessaloniki, Greece, with the use of hedonic modelling and geographically weighted regression. Its objective is to highlight whether these projects have any impact on commercial values, the spatial distribution of this impact and the professionals' acceptance-willingness to maintain regenerated urban areas at a good condition.

First of all, it is clear that the amount offered by citizens for the maintenance of the regeneration is remarkably lower than those offered at periods of increased economic and social stability. Apart from that, the regeneration's influence on businesses and turnovers is mainly concentrated very close or on the regeneration due to the increase of visits. Especially professionals who deal with fields related to the regeneration (bike stores, pet shops etc.) documented a notable increase in turnover, in their willingness for maintenance of the regeneration and in the demand and frequency of new such shops. These changes in combination with the decrease in criminality rates and the low availability of such properties led to the increase in sale and lease values. As far as the spatial context is concerned, the Great Alexander Avenue which is a wide and high-speed street influences the impact of the regeneration to the seaside properties. Moreover, the shape of each regeneration determines the areas on which more attention must be given towards the improvement of the urban environment. In the case of horizontal regenerations, such as this regeneration, the vertical streets play a major role to their impact.

Concluding, this regeneration, as most in Greece, place an impact on properties up to an average distance of 300 m., in contrast to most regenerations abroad which influence properties stronger and at a greater distance, mainly due to the complex urban organization and the transportation issues of most large cities.

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Appendix:-

Context category	Variable	Explanation	Mean	St.deviat.
Economic context	Value Change	Percentage of value change due to the regeneration	0.0071	0.0295
	WTP amount/two months	The amount that citizens are willing to pay every two months for the maintenance of the regeneration	1.7602	5.5475
Real estate context	Ownership	Whether the property is owned or leased	1.2951	0.4570
	Year of construction	What year was the property constructed	1977.1393	10.5201
	Renovation	Has the commercial property been renovated?	0.4631	0.4997
	Size	The size of each commercial property	62.6680	41.7852
	Floor	On which floor is the property	-0.0061	0.1842

	Frontage	Size of frontage in meters	5.5527	2.7795
	Depth	Size of depth in meters	8.6014	3.2227
	Rooms	Number of rooms of the property	1.0984	0.3373
	Kitchen	Number of kitchens of the property	0.2295	0.4214
	WC	Number of WC of the property	0.8238	0.3818
	Storage room	Number of storage rooms of the property	0.6598	0.4747
	Heating	How is the property heated (kind of heating)	0.2742	0.2435
Urban & environmental changes / Impact of regeneration	In the area even before the regeneration	Where you located in the area even before the regeneration or did you move into it afterwards	0.9713	0.1673
	Turnover	Has your turnover increased, decreased or remained stable due to the regeneration	0.0820	0.3760
	Criminality	Has the criminality of the area increased, decreased or remained stable due to the regeneration	-0.0738	0.4383
	Parking	Has parking issues increased, decreased or remained stable due to the regeneration	0.3115	0.5531
	Aesthetic beauty	Has the aesthetic beauty of the area increased, decreased or remained stable due to the regeneration	0.6721	0.4704
	New activities	Have new activities/businesses increased, decreased or remained stable due to the regeneration	0.0000	0.4157
	More visits	Do you visit the regeneration area more often after its completion	0.7008	0.4588
	Frequency of visits	Which is the frequency of visits in the regeneration	0.4791	0.3192
	Pet	Do you own a pet for which you visit the regeneration	0.3566	0.4800
Social context	Sex	Are you male or female	1.4754	0.5004
	Family status	Whether you are married or not	0.7172	0.4513
	Children	Number of children in the family	1.3320	1.0186
	Age	In which age category are you	3.5123	1.1421
	Educational level	What is the level of education of each citizen	0.6898	0.1717
	Residence area	Which is the area where each citizen's residence is located	1.3975	0.6680
	Occupation	What is your occupation	1.6598	1.0478
	Average family income	In which category does you	3.3238	1.1211

		family income fall into		
Spatial context	Distance from regeneration	What is the distance of the property from the regeneration	224.4901	132.3752
	Distance from V.Olgas Avenue (150 m. – 350 m.)	What is the distance of the property from V.Olgas Avenue (one of the main city avenues parallel to the regeneration with direction to the CBD)	68.8420	86.8728
	Distance from Alexander the Great Avenue (seaside avenue)	Distance of the commercial property from the avenue alongside with the sea	197.8812	105.1382
	Distance from Papandreou G. str. (parallel to the seaside) (20 m. – 120 m.)	Distance of the commercial property from the avenue alongside with the sea (Papandreou G. str. is the road extension of Alexander the Great Avenue)	535.5675	516.3806
	Distance from urban green of regeneration	Distance from the urban green areas in the regeneration	143.5994	97.2394
	Distance from urban green of V.Olgas Avenue (150 m. – 350 m.)	Distance from the urban green areas of V.Olgas Avenue	366.1584	150.8326
	Distance from urban green of the royal park (at the end of the regeneration)	Distance from urban green of the royal park (a park at the end of the regeneration)	1763.2783	722.4129
	Distance from urban green of Egnatia str. (800 m. – 1000 m.)	Distance from the urban green from Egnatia str. (the main two direction city street parallel to the regeneration at the south-north)	980.2659	178.2678
	Distance from restaurants/entertainment (40 m. – 60 m.)	Distance of the property from the restaurants/entertainment businesses opposite to the regeneration	70.5569	68.5530
	Distance from market (100 m. – 350 m.)	Distance from the market of V.Olgas Avenue	22.9329	22.6695