
Defining Housing Market Area: A case study of Greater Manchester

An Extended Abstract for ERSA 2026-S26

Contents

1.0	INTRODUCTION	2
1.1.	BACKGROUND OF THE TOPIC;(Sustainable cities 11 th SDG Agenda).	2
1.2.	THE SHAPE AND SCOPE OF THE PAPER.....	3
2.0	METHODOLOGY	4

1.0 INTRODUCTION

1.1. BACKGROUND OF THE TOPIC.

Housing market has been and still one of the hottest topics in field of urban development because it touches the fundamental necessity of every human being regardless of the race, age or gender who by any means must live in a house. Individuals/Households make decisions on where to live basing on factors that maximizes household/individual satisfactions. Moreover, population change either by natural means (birth and death) or artificial means of migration (in-migration and out-migration) has an adverse impact on housing demand and supply in many countries especially to the advanced and emerging economies whereby the house is a market oriented product

Emanating from the United Nation 11th sustainable development goals (SDG.11) which focus on ensuring that human settlements are safe, secured, resilient and inclusive for the thriving of any community (Radovic, 2019) The top two targets of this goal are having adequate, safe and affordable housing as well as accessible transport systems by 2030 (Radovic, 2019) make this research viable and a catalyst indicator in speeding up the rate of attainment by proposing urban planning basing on functional boundaries apart from the default administrative boundaries. Hence, brainstorming the science and mechanism behind the housing market is crucial to glimpse the hidden trends and patterns for predicting the accurate, reliable, and sustainable housing future.

Though delineation of housing market boundaries has undergone constant changes over time and space by various scholars and professionals to cater the intended objective of classification. Such as (Alonso, 1964; Alonso, 1964; Kain, 1962; Muth, 1969) who modelled and demarcated the labour market areas and housing market areas by evaluating the commuting statistics to produce Travel to Work Areas(TTWAs) which later was used as an intelligent guess for defining housing market areas (Hincks, 2006; Hincks, 2010). The assumption of perfect environment was used such that house prices were inversely proportional to travel distance to the city centre and the jobs were highly concentrated in the city Center (Access-space model) (Alonso, 1964)

Later, (Jones, 2002; Macclennan, 1992; Brown, 2008) defined Housing Market Areas based on the migration pattern from contiguous settlements through measuring the rate

of self-containment in an area where by the rate of in migration and out migration is of minor significance. Although there are push and pull factors influencing the interregional migration such as lucrative careers, housing prices, safety, and accessibility factors, in results they define and shape the urban housing settlements in a region.

1.2. THE SHAPE AND SCOPE OF THE RESEARCH PAPER

There has been a long debate on who, how and when to define a housing market area over time and space of economic and population dynamics. Various scholars, government councils, professionals and developers have tried to explore different paradigms of demarcating a housing market area. Such as (Colin Jones, 2009) used the household search and migration trend to define the self-contained housing market areas, and specifically provided the definition of the Housing Market Area (HMA) as the area where there is a balance between demand and supply of housing amenities. Moreover, (Vargas, 2009; Wong, 2010) discovered inadequacies in relying on migration patterns only or commuting patterns only thus produced the HMA by using the combined approach with upper tier and lower tiers of commuting patterns thresholds and migration pattern thresholds respectively.

However, with recent dynamics and fluctuations, has created the room of housing analytics research such that the increase in population over a fixed space due to economies of scale on the area or household preferences will be led to limited supply of houses in short run hence leading to increase in prices of residential houses due to limited supply of houses.

Moreover, the migration and commuting statistics which were dominantly adopted have time lag (are recorded once over a decade horizon through census), The results have been hiding the important patterns and trends that occurred in between the years, hence underestimating, or overestimating the policy planning impacts on the area. With the rise of online dataset platforms on houses for residential purposes and rental spaces like Zoopla (Zoopla-team, 2023), Right move (Rightmove-team, 2023), Home.co.uk (Home-team, 2023) that has recorded and updated time series on sale and sold house prices, houses for rents on a daily, weekly monthly, quarterly and annual basis over two decades).

There has been imminent change in population, house prices, rental prices, commuting flow and migration flow over time. Hence this research aims at utilising the potential of up-to-date house prices data, rental statistics, commuting and migration flow data to bridge the gap created in housing market research. Because housing market area is defined and characterized by some levels of self-containment where demand and supply are at ease/equilibrium.

2.0 METHODOLOGY

2.1. OBJECTIVES OF THE RESEARCH

The main aim of the research is finding the maximum likelihood estimator of housing market areas that enable the formulation of appropriate housing policies in Greater Manchester.

Hence, this paper aim to answer the following specific questions.

- i. Why deriving housing market area is important?
- ii. How to derive the housing market area?
- iii. Are there innovations in delineating the house market area?

2.2. CONCEPTUAL FRAMEWORK IN DEFINING HOUSING MARKET AREA.

Following the inadequacy realised in previous research and publications, rental sector was highly neglected due to inadequate data collected since the online property searches and market was at its infant stage. Also house prices as an alarming indicator was not properly utilised due to absence of good quality data for carrying out rigorous predictive and prescriptive analytics in housing demand and supply. Hence in order to fill the gap , the housing prices and rents factor was the adopted methodology in demarcating housing market area because of the presence of big data generated up to postcode level from Online property websites such as Zoopla, Rightmove and Home.co.uk. The exploratory spatial data analysis was carried out and visualized using the Moran scatter plot.

2.3. THE CASE STUDY OF GREATER MANCHESTER

Greater Manchester is a metropolitan county and combined authority area in Northwest England. It has grown to become the second most populous urban area in United Kingdom hosting about 2.8 million people distributed across 1.2 million residential units on its 10 boroughs (2021 Census-ONS Statistics). It is bordered by Lancashire to the north, Cheshire to the South, Derbyshire and Yorkshire to the east and Merseyside to the West

The distribution of population among Greater Manchester boroughs is uneven, majority are highly concentrated in Manchester metropolitan with average share of 18 percent of total greater Manchester population, followed by Wigan having percentage share of 12 to total population in the county, and approximately similar averages share for Bolton and Stockport equating to 11 percent while the rest of the boroughs have an average share of less than 10 percent. Given that the land is fixed (neither expands nor contracts), fluctuations in population on these boroughs form an alarming case for designing and implementing strong policy mechanism that will align with the market responsive planning on housing amenities.

2.4. DATA SOURCES AND SPATIAL SCALE OF DATA

Data used in this research comprise of secondary data gathered and stored in official statistics websites, such as <https://www.ons.gov.uk>. Population data by age category as well as absolute total from 2001, 2011 and 2021 Census respectively. They are in Borough spatial scale with a ten-year lag because census is undertaken after every 10 years and are attributed to Office of National Statistics that were extracted from the NOMIS website(<https://www.nomisweb.co.uk/>). The household statistics have also been extracted from NOMIS website for 2011 and 2021 censuses, which were further broken down into subcategories of owner occupied, social rented as well as private rented with negligible number in shared ownership and living rent free category which is accumulated at Greater Manchester County level for confidentiality and data protection.

Moreover, rental statistics at Borough level have been extracted from Valuation Office Agency from 2011 to 2019, estimation will be done with the backing up of online dataset to reach 2021 which is the final year of analysis. To take full advantage of the big data so

as to find the interaction between housing price and rental prices at postcode level, the median rental and house price data of August 2021 have been web scrapped from online real estate website (<https://www.home.co.uk/company/data/>) at median unit statistic which is a robust measure of central tendency apart from mean which is mostly affected by outliers. The significance of the sampled website over other online websites of Zoopla and Right move is because of the efficient time series summary recorded at postcode level such that reduce bias and improves precision in analysis.

The sampled house type in the analysis is a two-bedroom house which has been proved from the UK census average household size of England, Northwest England, and Greater Manchester particular of approximately to 2 members per household for both 2011 and 2021 Censuses. Also, from the Housing Market Area profile summary of Northwest England as part of the Strategic Housing Market Assessment recommends a two-bed house as the efficient and most demandable property for purchasing, private renting as well as social renting (Sutton, 2020). This will automatically eliminate the large number of student's accommodation which are temporary and locational (close to universities) so student accommodations are out of scope.

Moreover, to prove level of self-containment concept in migration, the migration statistics for 2011 have been extracted from ONS website depicting the high level of internal migration while the in-migration and out migration rate is of minor significance.

Finally, to phase out the application of TTWAs as a means of determining housing market area due to instability and replicability problems, a 50-year data from 1971 Census to 2011 census that depict the overall change in the number of TTWAs in England have been extracted from the NOMIS website. The fact that there is increase in number of homes working individuals, commuting patterns will be an unreliable means of depicting housing market areas.

2.5. THE KEY ANALYTICAL METHODS USED IN HOUSING MARKET RESEARCH.

All the data on house price, household, population, migration and TTWAs are in excel file format. Migration and TTWAs are analysed in the same file format of Microsoft Excel files while House price data, Population data, and Rental data per borough is geovisualized by using Python programming language thus the files will be converted into comma separated value (CSV) format for easy manipulation of data. They will be transformed into long format as a necessary form for data importing.

The geographical boundaries file for Greater Manchester 10 Boroughs names Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan are in GeoJSON format which is a Java Script Object Notation format for storing geospatial data. Moreover, Middle layer Super Output Areas(MSOAs) level data were extracted from the Office of National Statistics, they were later spatially joined for efficient analysis. Moreover, the House price to rent ratio was computed to demarcate areas into clusters.

Python programming language was applied in importing, transforming, merging, cleaning data, modelling, and geo-visualising data. With the practical application of geographical python packages such as Geopandas and pandas for importing and reading geographical files, Contextily, Shapely, Fiona, seaborn and matplotlib for static visualization of data while folium package was used in visualizing interactive maps.

Since the research problem is diagnostic in nature whose aim at unveiling and evaluating the authenticity of previous methods used in clustering housing market areas based on gap realised. Exploratory spatial data analysis techniques such as Spatial Autocorrelation with the assumption of the absence of spatial randomness was applied for consistency for replication of the estimator realized. Pysal and libpysal packages were used to compute spatial autocorrelation and spatial weights(Queen) respectively. Before analysis the coordinate reference system was checked across dataset, they were projected to British National Grid(EPSC:27700).