Urban regeneration and economic sustainability of office market: the case of Manchester, UK

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Abstract

The market impact of planning policy became the focus of the debate on state-market relations (Heurkens et al., 2015). This research aims to expand this debate by employing a conceptual framework of market sustainability to ask whether regeneration policies have assisted Manchester office market evolving sustainably in the notion of market maturity, investment competitiveness and economic resilience. Since the late 1970s, property-led regeneration has been one of prevailing planning instruments expected to deliver economic growth through real estate development. Despite receiving criticism on lacking the social focus, the main purpose of property-led regeneration is to foster economic development of cities; however, little attention is drawn to test the policy outcomes in the context of economic sustainability. The investigation upon the historical evolution of policy impact on property market explains the long-term effect of economic sustainability reflecting the extent of market maturity, competitiveness and resilience since the behaviour of real estate market is highly sensitive to cyclical movements in economy indicating the various concerns over investment risk. A quantitative method is employed by constructing the regeneration office index by collecting rental value of office buildings in Manchester provided by CoStar. Office market in Manchester is an interesting case since it expanded substantially from the 1980s and arguably claimed to be the second largest market outside London by the late 1990s as a popular real estate investment hub for institutional investors. The research suggests that this market transformation is likely attributed to the city's regeneration strategies, which intentionally enlarged the scale of office market particularly since the 1980s. Empirical evidence from this study suggests that entrepreneurial regeneration strategies led by the City Council over time did not increase the level of systemic risk through the financialization of property market. Office market in Manchester as a whole demonstrates signs of sustainable performance.

Keywords: Regeneration, Economic Sustainability, Office Market, Market Maturity, Competitiveness, Resilience

Introduction

The market impact of planning policy became the focus of the debate on state-market relations (Heurkens et al., 2015). Since the late 1970s, property-led regeneration has been one of prevailing planning instruments expected to deliver economic growth through real estate development. Office market in Manchester is an interesting case since it expanded substantially from the 1980s

and arguably claimed to be the second largest market outside London by the late 1990s as a popular real estate investment hub for institutional investors. The enormous growth of market size in office sector has been deliberately encouraged and facilitated by the regeneration policies of Manchester City Council since the 1970s since the Council noted that the growing finance services could be the next economic engine for the city to revive its economic prosperity.

Office markets attract a substantial volume of international real estate investment in the large cities which rely heavily on the financial services sector. The dual concentration of office market investment and financial services centres points out the likely adverse effect due to less investment benefits has arisen from weakened economic diversification (Stevenson et al., 2014). Lizieri and Pain (2014) proclaim that,

"Systemic risk arises through the process of real estate investment in such cities due to the locking together of occupational markets (functionally specialized in financial services activities), investment markets (through acquisition of offices), supply markets (both through demand drivers and the supply of finance for development), and real estate finance (through property as collateral for lending)".

Guironnet and his colleages (2016) observe that investors' expectations on commercial properties are met by translating investment risk into the built environment through regeneration development. Under the increasing austerity pressure, the shortage of funding drives many city governments to rely on property markets, whereby regeneration development becomes a platform to turn properties into investment assets for financial investors as a form of property market financialization.

Since the late 1970s, property-led regeneration has been one of prevailing planning instruments expected to deliver economic growth through real estate development. Despite receiving criticism on lacking the social focus, the main purpose of property-led regeneration is to foster economic development of cities; however, little attention is drawn to test the policy outcomes in the context of economic sustainability. This research focuses on the analysis of quantitative data to evaluate the level of market maturity, economic resilience and competitiveness for determining individually whether the regeneration office market has reached its mature state; how resilient the market has been during cyclical economic downturns as well as its competitiveness for attracting inward investment. All these findings feed into a collective reflection on whether the whole Manchester office market in the city centre became more sustainable over the designated period.

The structure of this paper is arranged by firstly introducing the essential elements of constructing an index including the rationale of selecting Rental Value as the market indicator; the use of transaction-based data and CoStar databank; the boundary of research area and regeneration areas; the process of constructing a real estate index; then the concept of property cycles. Then the measurement variables and data analysis are explained following with the conclusion section and finally the limitation of the data collected.

Rental Value as the key market indicator

According to Peter Wyatt, (2013), the typical appraisal information such as market indicators include (1) current market rents; (2) rental growth; (3) yields; (4) movements in market indices. For the purpose of this research and design, the emphasis is placed on analyzing Rental Value and Rental Growth as well as market movements of the indices.

Property as an investment has to compete with other asset classes primarily equities and bonds. Institutional investments heavily concentrate on the prime commercial markets and are held in a form of portfolio asset, which is an important element for the observation of institutional investor behaviour. For portfolio information, one of the key criteria in determining allocations across the respective asset classes is performance-based measure of risk (Adair et al., 2005, p151; Wyatt, 2013). Consequently, the focus is placed on analyzing the level of investment risk based on the formula of calculating rental value.

As explained in the previous chapter, the rationale of choosing rents over other popular variables for measuring market performance, such as returns, yields or capital values comes from the fact that rent level determines the profitability for developers and investors and hence the level of new developments (Jadevicius and Huston, 2017; Barras, 1984). Also since rent is used to estimate the value of the property in the capital market, it plays a central role in bringing four inter-related commercial property markets (user, investment, development and land) into simultaneous equilibrium (Ball et al., 1998).

Transaction-based rental value and CoStar databank

The data of the real transactions for 4 star office spaces were collected from the CoStar property database including actual lettings, rent reviews and lease renewals but excluding the asking prices. This research intends to observe partly the behaviour of institutional investors who demonstrate certain habit-persistent or adaptive behaviour during their decision-making process in investment. They tend to prefer prime market when considering investing in office market. According to this requirement, 5 and 4 star office buildings classified in the CoStar databank are qualified (CoStar, 2017). However, the limitation of much lower number of transactions of 5 star office suggests greater imperfection due to the smaller pool of sample size.

The CoStar Building Rating System is a national rating for commercial buildings on a universally recognized 5 Star scale. The elements of an office building were segmented into five main categories: Architectural Design, Structure/Systems, Amenities/Management, Site/Landscaping/Exterior Spaces and Certifications. The characteristics of a 4-Star office building are very similar to a 5-Star building with a slightly lower quality in terms of building age. It is useful to list the definitions for both 5-star and 4-star office building as follows (see the Appendix 1).

Analysing prime rents has at least two uses: first, it provides a means of measuring the varying effects of the interaction of supply and demand; second, it gives an impression of comparative rental growth between different areas. However, one difficulty in analysing rents in an area for a certain period is that because they represent the state of the market at each reference point, the inclusion of prime rents for prime properties leads to an overstatement of the rental growth exhibited by a particular property between any two dates and ignores obsolescence (Stapleton, 1989, p59).

Research area and regeneration areas

As mentioned in the previous chapter, the defined research area adopts the same boundary defined in this 1967 report. It is bounded by the Mancunian Way, River Irwell and a line (following now the inner ring road) to the North of Great Ancoats Street, comprising about 1100 acres; at that time, more than 80% of the land use of the designated area was for business and retail and 20% for industrial use. There were six redevelopment areas (labeled with A – F, see Figure 1) identified in the 1967 report but this research excludes the redevelopment area further south beyond the Mancunian Way because it is further away from the Central Business District (CBD) of the city centre.

Figure 1 Redevelopment Appraisal Plan 1967 and research area
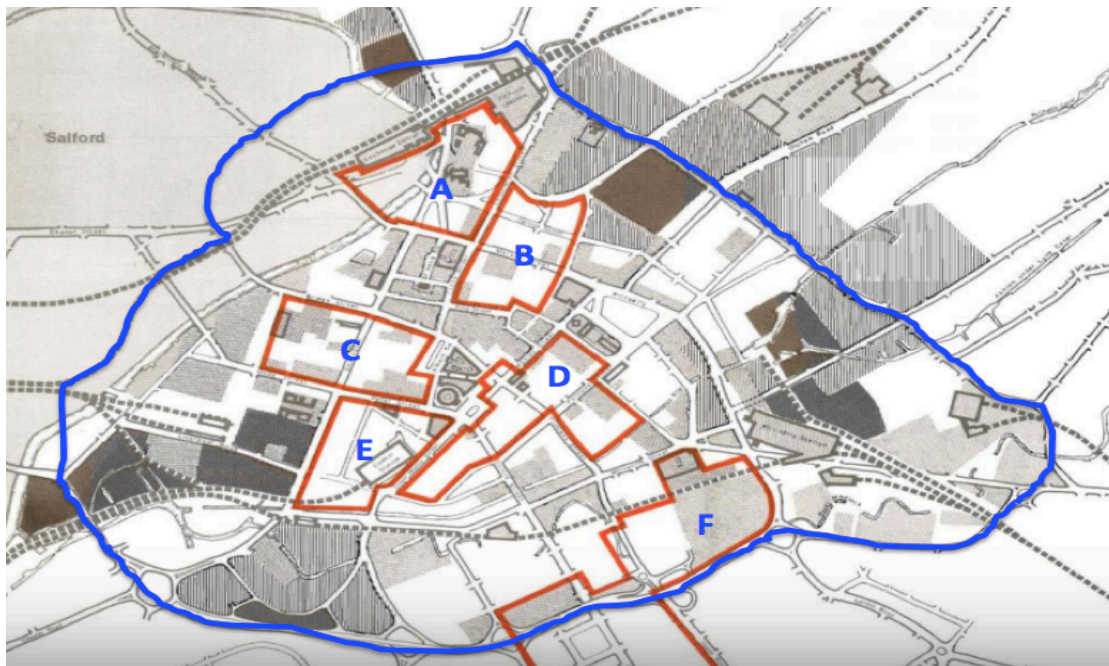
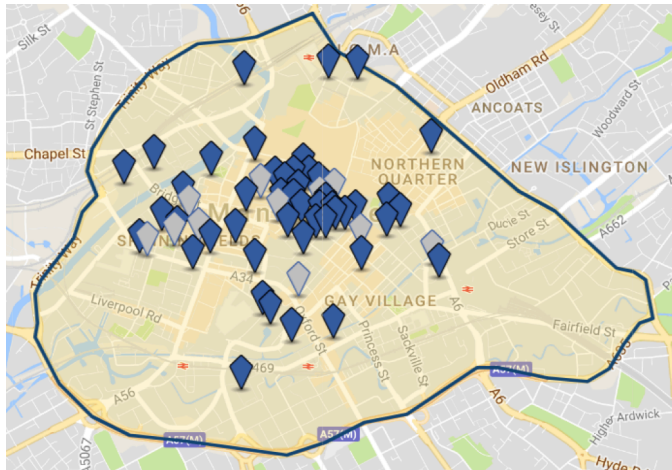**Figure 2 Four-star office buildings**

Figure 2 displays all office developments constructed by 2017 (including 2017) with new lettings, rent reviews, lease renewals and available space on the market with asking price. The search requirements include the real transaction of lettings, rent reviews and lease renewals completed between 1984 and 2017.

The construction of a real estate index

An index shows numerical change in the form of price or percentage over time. The indices constructed in this research comprise a single variable to highlight inter-submarket and inter-city differences. The single statistical series avoid a common problem of multi-variable series, which combine several variables expressed in different units or in categories of the same unit to a common scale and this standardising process could eliminate certain change factors (Horn, 1993, p47).

Mean and median

The first step of index construction is to determine the annual figure for each year, which normally refers to mean or average rental value. Mean or average refers to the sum of the values of each of the members of the sample divided by the total number in the sample; while the median figure refers to the value of the middle member of that sample. The average rental value calculated here is a mean figure. Table 1 and 2 demonstrate the process of calculating the average mean of Rental Value for each year and components used to obtain the figures. Total value is summed up and divided by the number of transactions for that year to achieve the average rental value. Take the year of 1990 for example, the total value is £58.92 divided by 5 times transactions that gives an average value of £11.78 in rent.

Table 1 Calculation format for Non-regeneration 4-star office Rental Value

Non-Reg/ Year-Rent	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
No of transactions	1	0	3	4	4	5	5	1	1	4	4	3
Total value	6.95	0	17.95	22.12	30.75	58.2	58.92	7	13.5	36.5	51.4	28.5
Average	6.95	0	5.983	5.53	7.688	11.64	11.78	7	13.5	9.125	12.85	9.5
Non-Reg/ Year-Rent	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
No of transactions	3	12	5	3	2	5	6	10	17	22	23	31
Total value	33	184.9	62	37	32.5	74.25	97.58	151.3	269.8	400	387.4	585.2
Average	11	15.41	12.4	12.33	16.25	14.85	16.26	15.13	15.87	18.18	16.84	18.88
Non-Reg/ Year-Rent	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
No of transactions	19	19	11	6	10	17	29	35	22	12		
Total value	379.55	321.9	193.8	116	183.5	303.5	580.8	695	476.2	290.4		
Average	19.976	16.94	17.62	19.33	18.35	17.85	20.03	19.86	21.65	24.2		

Table 2 Calculation format for Regeneration 4-star office Rental Value

Reg/ Year-Rent	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
No of transactions	1	0	2	3	1	0	2	1	1	0	0	3
Total value	6.75	0.00	14.45	21.70	7.50	0.00	20.67	7.00	10.00	0.00	0.00	34.00
Average	6.75	0.00	7.23	7.23	7.50	0.00	10.34	7.00	10.00	0.00	0.00	11.33
Reg/ Year-Rent	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
No of transactions	1	3	5	1	4	4	3	5	13	18	14	18
Total value	12.00	45.00	61.00	13.00	69.50	71.50	51.47	100.40	273.25	350.05	317.85	433.65
Average	12.00	15.00	12.20	13.00	17.38	17.88	17.16	20.08	21.02	19.45	22.70	24.09
Reg/ Year-Rent	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
No of transactions	14	9	13	12	10	15	11	16	10	2		
Total value	333.25	165.79	263.48	254.95	191.10	323.42	243.28	378.52	231.00	49.40		
Average	23.80	18.42	20.27	21.25	19.11	21.56	22.12	23.66	23.10	24.70		

As noted in these tables, Rental Values for several years are missing, for regeneration office, including the years of 1985, 1989, 1993 and 1994; for non-regeneration, only one year, 1985 (see Table 3). To overcome this problem, these rental values have to be estimated by using the previous average rental value multiplying the rental growth of office market for that year provided by IPD. This method could increase the level of the calculation error for accuracy but the estimated figures only take up a marginally small proportion of about 7% of total statistics used and this should not cause a significant impact on the overall outcome.

Table 3 Estimated Value

Rental Value	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
RV average R 4-star	6.75	7.17	7.23	7.23	7.50	9.62	10.34	7.00	10.00	9.51	9.36	11.33
RV average NR 4-star	6.95	7.38	5.98	5.53	7.69	11.64	11.78	7.00	13.50	9.13	12.85	9.50
Rental Value	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
RV average R 4-star	12.00	15.00	12.20	13.00	17.38	17.88	17.16	20.08	21.02	19.45	22.70	24.09
RV average NR 4-star	11.00	15.41	12.40	12.33	16.25	14.85	16.26	15.13	15.87	18.18	16.84	18.88
Rental Value	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
RV average R 4-star	23.80	18.42	20.27	21.25	19.11	21.56	22.12	23.66	23.10	24.70		
RV average NR 4-star	19.98	16.94	17.62	19.33	18.35	17.85	20.03	19.86	21.65	24.20		

Index numbers and time-series data

The concept of index numbers is explained as follows. The Index method employed in this research comprises time-series data that presents information that depicts how a variable, for example, in this research, rental values, changes over time. Time-series analysis seeks to discover the patterns underlying the series, which can capture fluctuations reflecting the variable effects of time on statistical series. The basic approach of time-series analysis used here is to compare values with different periods and markets to identify trends (Horn, 1993, p58).

This method has the advantage of giving the precise figures and is therefore a useful reference if one wishes to test any theory and see if it predicts accurately. Time-series data can be shown graphically and it gives a obvious picture of how the figures have moved over time and whether the changes are getting bigger, meaning the curve is getting steeper, or smaller, meaning the curve is getting shallower. Also it provides a reading on what the likely figure would be for some point between two observations. Furthermore, it is possible to combine multiple

sets of time-series data on one graph to show their relative movements over time.

Time-series data are often expressed in terms of index numbers. One year is selected as the base year and this is given the value of 100. The use of index numbers allows us to see clearly any upward and downward movements and to make an easy comparison of one year with another.

Index numbers are a useful way to present a series so that it is easy to see how it has changed over time, and they facilitate comparisons of series with different units of measurement (2010, Brooks and Tsolacos, pp. 21-24). They are widely used in economics, real estate and finance. Index numbers also make comparisons of the rates of change between series easier to comprehend. The simplest way to do this is to construct a set of price relatives. This is usually achieved by establishing a base period, for which the index is given a notional value of 100, and then the other values of the index are defined relative to this and are calculated by the formula

$$I_t = \frac{P_t}{P_0} \times 100$$

An arguably more important use of index numbers is to present the change over time in the values of groups of series together. This would be termed an aggregate or composite index number, for example, a stock market index, an index of consumer prices or a real estate market index. In all three cases, the values of a number of series are combined or weighted at each point in time and an index formed on the aggregate measure. Three commonly used methods of the weighting scheme employed to combine the component series are listed as follows:

- Equal weighting of the components;
- Base period weighting by quantity, also known as Laspeyres weighting; and
- Current period weighting by quantity, also known as Paasche weighting.

Equal weighting evidently has simplicity and ease of interpretation on its side; it may be inappropriate, however, if some components of the series are viewed as more important than others.

In this research, only a single variable is required, the office rental value; therefore, there is no issue to weigh different components in accordance to the level of their importance. As a result, the equal weighted index is employed.

The easiest way to form an equally weighted index would be to first construct the average, meaning un-weighted or equally weighted office rental values across the selected buildings, which are given in the Table 3 and 4.

Effectively, the equally weighting method ignores the sales information in assigning equal importance to all the buildings. Then a value of 100 is assigned to

the 1984 figure for the index £6.75 for regeneration office and £6.95 for non-regeneration office respectively, so that the figures for all other years are divided by £6.75/£6.95 and multiplied by 100 (see Figure 5 below).

Using index numbers to measure percentage change in the index from the previous year. To work this out the following formula is used:

$$((I_t - I_{t-1})/I_{t-1}) \times 100$$

where I_t is the index in the year in question and I_{t-1} is the index in the previous year. Thus to find the growth rate from X year to Y year we first see how much the index has risen $(I_t - I_{t-1})$ then divided by the index of the previous year (I_{t-1}).

Property Cycles

Within a market economy such as UK, its market mechanism is mainly based on the supply and demand theory with an assumption that through competition between suppliers and demanders, the actual price, i.e. market price, could go above or below the equilibrant natural price; but for long term, the price of every commodity would reach its natural price (Smith, 1776; Walras, 1889; Dome, 1994). Property cycles capture similar phenomenon to business cycles mainly described, "(cycles) reflect fluctuations in economic activity, with recurrent periods of expansion followed by contractions, recessions and revivals over periods usually varying from 1 to 12 years (Horn, 1993)".

Following the similar functions, property cycles can act as market indicators to identify recurring patterns and of the changes that mark the ups and downs of the chosen property market for its market experience and prospects. This leads to the formulation of theorising its market dynamics for the chosen sector.

Government policy could also significantly influence the market performance. In the built environment sector, Government could regulate the markets through the planning system, initiate direct development channeled through land policy and regeneration initiatives, and influence the behaviour of property institutions through taxation and fiscal mechanisms (p. 3, Adams et al., 2005). As Grover and Grover (2013) observed that the possible cyclical effect of policy on property markets, "Economic policy is subject to regular changes for political reasons. Cycles in the property market could therefore reflect the electoral cycle of the major economies. Turning points might then be associated with changes of administration and the pursuit of different economic policies or ideologies". They further explained the causes of property cycles, "Although endogenous factors are necessary for the existence of property cycles, exogenous shocks increase volatility and lead to the generation of a new round of cycles".

Consequently, it is sensible to analyse the performance of office market in Manchester in the context of property cycles. According to Huston and Jadevicius (2017), between 1978 and 2015, there are four cycles identified, see the Table 4 and Figure 3 as follows: 1978 – 1984; 1985 – 1993; 1994 – 2003; 2004 – 2009

that are adopted as reference cycles for the comparison with regeneration, non-regeneration office rent series as well as the office rent series for the whole Manchester to bring our their conformity, leads, lags and their respective turning points (Horn, 1993).

Table 4 UK all property rental series cycle timing

Cycle phase	All property Year	Duration	Retail Year	Duration	Office Year	Duration	Industrial Year	Duration
Trough	1978		1978		1978		1978	
Peak	1980	2	1980	2	1980	2	1980	2
Trough	1985	5	1985	5	1985	5	1986	6
Peak	1990	5	1989	4	1989	4	1990	4
Trough	1995	5	1995	6	1994	5	1995	5
Peak	2001	6	2000	5	2001	6	2002	7
Trough	2003	2	2002	2	2004	3	2004	2
Peak	2007	4	2007	5	2007	3	2007	3
Trough	2010	3	2013	6	2010	3	2012	5
Average		4		4		4		4
Average cycle		8		8		8		8

Source: Huston and Jadevicius, 2017

In this research, due to the available data, the period collected runs from 1984 to 2017, which covers the last three cycles from 1985 to 2009. The normal distribution of both Rental Value and Rental Growth is calculated to measure the level of investment risk for each property cycle in order to assess the level of economic resilience of the office market in Manchester.

Figure 3 UK all property rental series cycle performance
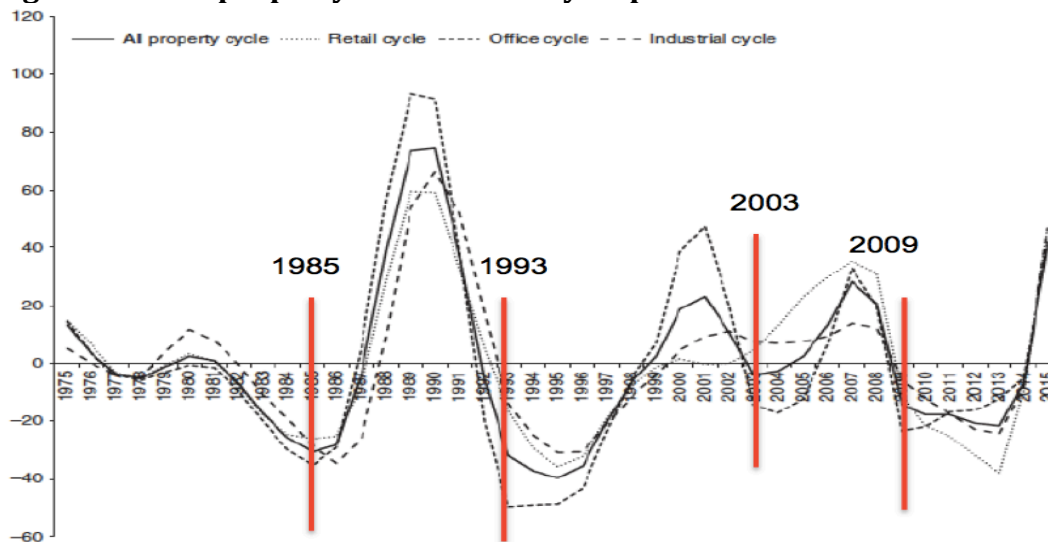
Source: Huston and Jadevicius, 2017

The phenomenon of property cycles can be seen in the history of development, occupier and investment markets (Baum, 2010; Barras, 2009). These repeatable patterns are expressed in the form of real estate developments, rents and yields, with these in turn driving capital values and returns, which explains the close connection between rents and returns.

Rents have been strongly pro-cyclical with GDP. For example, Barras (2009) shows that periods of growth in GDP above the long-term trend growth have coincided with periods of growth in rents above long-term trend growth. Then the demand side is also pro-cyclical with economic growth indicators, such as GDP growth, but the inelasticity of supply means that even highly regular demand cycles can generate irregular rental cycles. Hence rents will rise in response to economic growth, and with a static supply in the short term rents will continue to rise as construction activity gathers momentum; but the peak in construction activity may arrive after the peak in GDP growth, and an oversupply will result (Baum, 2010, p26).

The Analysis Outcomes

Market Maturity

The discussions of this section consist of analyzing the general movements of rental value and rental growth over the research timeframe to assess the maturity of regeneration office market in comparison with non-regeneration market. Also, with a consideration of inflation effect on rental value, the concepts of nominal and real value are explained. Real rental growth for these two sets of data was calculated and analysed. Two primary measurement criteria suggested by (Jones and Watkins, 1996) include (1) values rising to a point at which the long-run price makes private sector development viable and (2) evidence exhibits a long-run period of sustained letting and re-letting activity. Property cycles are used to identify their conformity, leads, lags and their respective turning points over time (Horn, 1993).

Rental Value

Between 1988 and 1998 shown in Figure 5, Rental Value of non-regeneration properties from time to time exceeded the value of regeneration properties. However, after 1998, the rental value of regeneration properties remains higher than the value of non-regeneration ones. The average values of non-regeneration and regeneration office came really close in 1998 at £12.40 and £12.20 respectively; then grew to £14.85 and £17.88 in 2001; before the downturn of the last property cycle in 2008, they reached to £18.88 and £24.09 in 2007. This means that between 1998 and 2007, the growth rates of rental value increased to 52.26% for non-regeneration office market and 97.46% for regeneration market, almost two-folds.

The movement of both markets seems to act contradictorily from 1984 to 2007. Such as between 1984 and 1988, the regeneration market remained flat but the non-regeneration one went down and then bounced back. Between 1984 and 1998, the curve of rental values for non-regeneration office market seems to be steeper than regeneration one, meaning greater changes in value. Or in 1995, the rental value of non-regeneration market went down dramatically in contrast to the steadily upward movement of regeneration market. This phenomenon

happened also in 2001, 2003 and 2006. After 2007, both markets tend to behave more consistently.

Figure 4 Rental Value Index 4-star Office 1984-2017
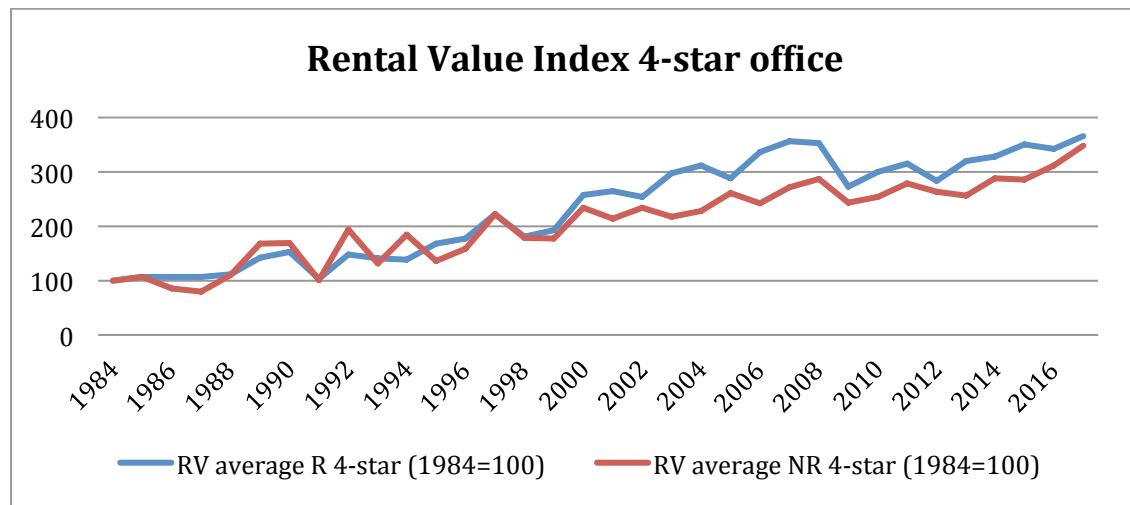
This may be able to be explained by examining the location of these regeneration office buildings. Figure 3 exhibits three regeneration areas that have the most office developments located in the current city zones including Central Retail District, Civic Quarter and Spinningfield. Office spaces located in these city zones are classified as the prime market with one of the highest rents in the city centre. Take Spinningfield as an example; the area is described "one of Europe's most successful urban regeneration projects…(and it is) the leading regional business quarter in the UK" and "the biggest commercial district in the city and home to some of the largest corporations in the North West" (See Figure 5).

**Figure 5 The current boundary of Redevelopment Area C**

According to one of the criteria to measure market maturity mentioned before, rental values seem to rise to a point at which the long-run price makes private sector development viable around 1998. Since then, the value of office rent in regeneration areas has steadily enjoyed a long-lasting increase of the price that

evidently looks favourable to private investors. The gap between both markets grew wider until 2009 when both sub-markets had a deep dip; however, regeneration office market still outperformed non-regeneration office market. Towards 2017, the gap grew slightly smaller.

The year of 1998 seems to be the turning point that regeneration office market consistently outperformed the non-regeneration market; it remains like this up to 2017 for 17 years. This certainly is a desirable outcome to impress investors for injecting their capital in these office developments expecting a likely higher return for their investment, which may further strengthen their confidence in a positive prospect of investing in such a market. Rental evidence suggests a robust demand from occupiers and investors who are willing to pay a higher rent for the office spaces located in the regeneration areas, which is one of the most significant factors to sustain healthy transaction activities in real estate market. This supports a sign of mature market behaviour that rental values grow to a point at which the long-term price makes private sector development viable.

The level of rental value has continuously gone up during these three cycles both for Regeneration and Non-Regeneration office market (shown in Figure 6). For the first property cycles, the gap of rental value between regeneration and non-regeneration office market is relatively small then evidently grew wider toward the end of the second cycle around 2000; the difference grew even wider during the third cycle and sharply narrowed down after 2008. The fluctuations in rent seem to subside for both markets since then. However, inconsistent movements of regeneration market in comparison with both the non-regeneration market and the reference cycles are noted. For the second cycle, the non-regeneration market started at a lower point in 1993; peaked in 1997 and ended at a dimmed figure to finish the cycle. But regeneration market moved in an opposite direction to the non-regeneration market from 2001 to 2003 with an up-lift curve at the supposed downturn of the cycle. The implication of this sign could be that the regeneration market is not yet vigorously stable and less mature.

Figure 6 Cyclical change of rental value
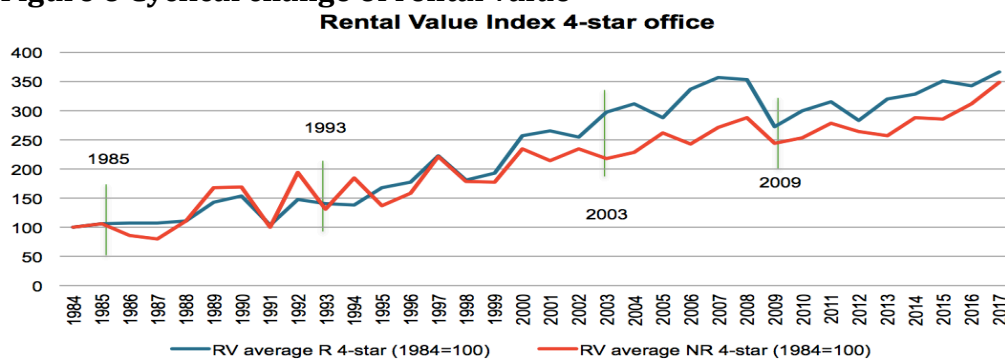
Transactions for rent value

There is a total number of 79 buildings qualified in accordance to the criteria, 31 developments located within regeneration areas and 48 in non-regeneration

areas (see Table 5) providing 569 transactions in total with a ratio 2 to 3, regeneration to non-regeneration office market.

Table 5 Number of transactions and buildings 1984-2017

Research area	Total transactions	No of building
Regeneration 4-star	215 (37.76%)	31 (39.24%)
Non-Regeneration 4-star	354 (62.24%)	48 (60.76%)
Total	569	79

Figure 7 shows the location of these office developments with three regeneration areas (B, C and D) highlighted in a red line where office developments are concentrated. There are 215 transactions collected from these regeneration buildings.

Figure 7 Regeneration office developments
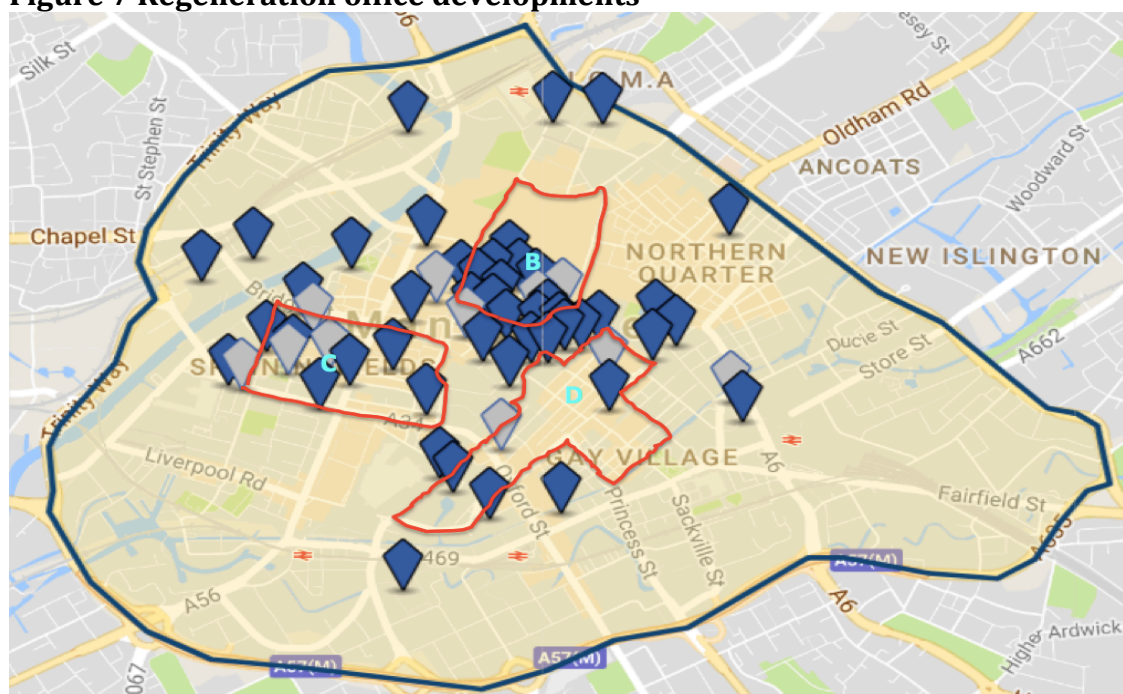
Regeneration Area B, C and D that comprise respectively 10, 13 and 4 developments (Table 6) account for 27 buildings out of 31 buildings in total for regeneration areas. Area B represents the city zone of Central Retail District defined in the 2017 city map. Two city zones, Civic Quarter and Spinningfield constitute the regeneration area C; also, the Gay Village and Chinatown for Area D.

**Table 6 Number of building in regeneration area and city zone 2017**

Regeneration area	2017 City zone	Zone No	Total No
Area B	Central Retail District	10	10
Area C	Civic Quarter	8	
	Spinningfield	5	13
Area D	The Gay Village	3	
	Chinatown	1	4

Examining the volume of the transactions in rent for the regeneration office spaces for the time of 1984-2017, the difference of the number of transaction for each office building between regeneration and non-regeneration market is slim: 31 regeneration buildings to 215 done deals equivalent to 7 deals for each building comparing to 48 to 354 for non-regeneration ones, which is 7.38 transactions for one development. This exhibits a long-run period of sustained letting and re-letting activity, which will demonstrate the credibility of the new office developments as an investment and Jones and Watkins (1996) consider this implies a critical mass with regard to market activity as the second criterion of measuring market maturity.
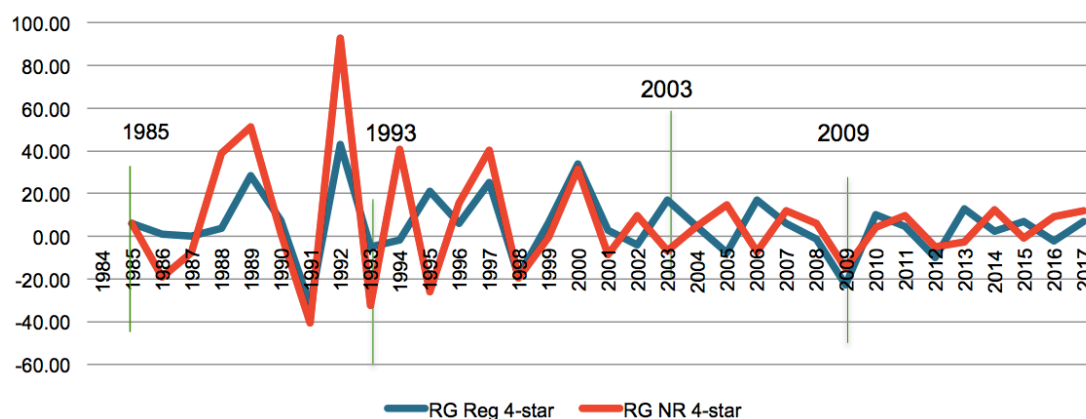
Rental Growth

Between 1985 and 2017 exhibited in Figure 8, the growth rate of Regeneration and Non-Regeneration office markets indicates a lot of fluctuations but seems to move towards a similar direction. Before 2001 and 2002, the movement of both sub-markets shows more volatility than the later period and the Non-regeneration market indicates marginally less stability than the regeneration one. The smaller fluctuations after 2002 for both markets indicate a sign of market stabilization and maturity.

Figure 8 Rental Growth 4-star Office 1984-2017
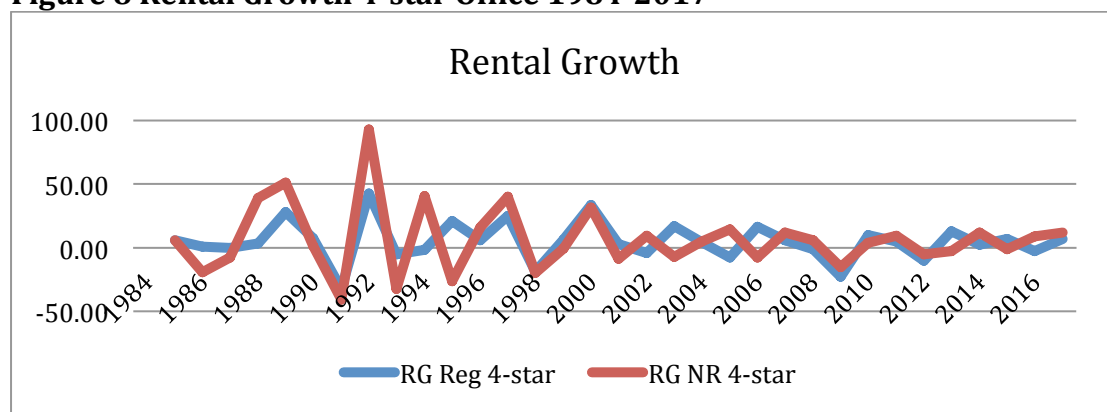
The movement of rental growth during the first cycle both was the most volatile among the three cycles and the last cycle the least (see the Figure 9). The possible explanation could be the market getting more mature and resilient to the changes of economic circumstances and market behaviour. Another likely reason could be more transactions available later on and this efficiency of market information increases the accuracy of data analysis.

Figure 9 Cyclical change of rental growth

Rental Growth

Again both figure 8 and figure 9 demonstrate some inconsistent movements in rental growth particularly between 2001 and 2007 as well as from 2013 to 2016. But the scale of fluctuations seems to be less volatile for the latter period. In general, the pattern of rental movement is becoming more stable and less volatile indicating a state of mature market behaviour.

Nominal and real value

While property rents appear to be closely correlated with inflation in the long run (2015, Baum, pp. 21), it is helpful to distinguish the difference between nominal values and real values. Nominal values or figures are the simple monetary values at the prices ruling at the time. Real figures or values are figures or values corrected for inflation. Thus, real growth has to deduct the inflation from the nominal growth. In order to show how much better or worse off an investment is, the nominal figure must be corrected for inflation. The general level of prices in most economies around the world has a general tendency to rise almost all the time, it is important to ensure that prices are compared on a like-for-like basis (2010, Brooks and Tsolacos, pp. 29). In the case of this research, the rise of rental values comprises two elements: it could be partly attributable to an increase in demand for office space, and partly because of inflation. It would be useful to separate the two effects and to be able to answer the question 'How much have office rental values risen when the effects of general inflation are removed?', or, equivalently, 'How much are office spaces valued now if they are measured in 1984 terms?'. To do this, the nominal office rental values need to be deflated to create a series of real office rental values, which is then in inflation-adjusted terms.

A price deflator series is required to deflate a series to their real values. It is a series measuring price levels in the economy, such as the Consumer Price Index (CPI), Retail Price Index (RPI) or the GDP implicit price deflator that are often

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used. In this research, the Retail Price Index (RPI) for X year to Y year and Consumer Price Index (CPI) for X year to Y year are employed since they are commonly used to adjust nominal values for inflation to real values. The real price series is obtained by taking the nominal series, dividing it by the price deflator index and multiplying by 100 under the assumption that the deflator has a base value of 100. Thus, the formula is in the following:

$$real\ series_1 = \frac{norminal\ series_1}{deflator_1} \times 100$$

And here, to plot into the variable for this research is Rental Value (RV); then, the formula becomes

$$real\ RV_t = \frac{norminal\ RV_t}{RPI_t\ or\ CPI_t} \times RPI_t\ or\ CPI\ reference\ year$$

Real rental growth

The Retail Price Index (RPI) figures provided by Office for National Statistics (ONS) from 1987 to 2017 are used to compute these rental figures with the formula above. For these 30 years, the rental value of the non-regeneration office market has grown 63.62%, equivalent to a real increase of 2.12% each year; comparing to 27.69% for the regeneration market, just less than 1% of the annual growth (see Table 7). This indicates that the non-regeneration market performed significantly better than the regeneration market and would be considered more favourably by investors in terms of the real profit gain through real estate investment. On the contrary, the performance of real growth in regeneration market could look less desirable and unattractive to potential investors that this suggests its less mature nature.

Table 7 Net Rental Growth minus inflation 1987-2017

Research area	Non-Regeneration	Regeneration
Total net growth (%)	63.62	27.69

Economic Resilience

Resilience and volatility

Economic variety might influence regional economic resilience and its vulnerability to exogenous shocks since a region with more diversified economic industries is less prone to shocks and more likely to recover from them (Simmie and Martin, 2010). The author of this research shares the view of Briguglio and colleagues (2009) on economic vulnerability and resilience; they define economic vulnerability as the exposure of an economy to exogenous shocks; and economic resilience as the policy-induced ability of an economy to withstand or recover from the effects of such shocks. Good governance is essential to provide an economic mechanism to eliminate or ease adverse shocks caused, for example, by business cycles to enhance the level of economic resilience together with strong macroeconomic stability (Hill et al., 2008; Stevenson et al., 2014).

Economic vulnerability could constitute a disadvantage to economic development and resilience by magnifying the element of risk in the growth process and increased risk could adversely affect economic growth (Briguglio, et al., 2009; Cordina, 2004).

As Zhu (2005) observed, the boom-bust nature of property price fluctuations play an important role in business cycles as a result, a resilient and stable property market in contrasting to a volatile and vulnerable one could be a major source of strength for the global economy, particular, during an economic downturn. Commercial property market tends to be more responsive to macroeconomic conditions and it is common to observe that commercial property prices could have a sharp decline during an economic downturn. The fluctuations in property prices can arise not only due to cyclical economic movements but also the changing perception of the risk premium with the phases of the cycle.

Through the discussions on the nature of economic resilience above, the level of economic vulnerability and stability affects the degree of economic resilience and market stability or in opposite, market volatility. In order to measure the level of economic resilience related to its volatility and stability in a market environment, the level of the investment risk is a critical evaluation variable used widely by the real estate and finance analysts. As a result, the investment risk is employed in this research to assess the level of economic resilience by calculating the normal distribution standard deviation of Rental Value and Rental Growth that reflects the level of investment risk within the defined property cycles explained in the next section.

The involvement of private sector, such as institutional investors into regeneration development has been emphasized by the government policy (for example, 2002, ODPM). This is because self-sustained schemes require both short-term investors, such as, development companies, and long-term investors, such as institutional investors. The role of the public sector is to create confidence in a regeneration area as an investment location thereby reducing the level of risk to investors. The raising of land values and achievement of profitability are positive influences in achieving self-sustaining investment.

Portfolio theory plays an important role in the investment market that explains the desire of institutional investors for an investment portfolio that produces higher returns, low individual asset risk and great diversification. This theory is based on the assumption that diversification reduces risk (2000, Brown and Matysiak, p249).

In practice, this means that strong holding property assets require strong prospective returns, low standard deviation of returns and a low correlation with equities and gilts. Returns reflect on the level of rental growth. This provides reasoning to analyse the level of investment risk with regard to the sustaining investment from the institutional investors' perspective that contributes to economic resilience of the market.

Economic Resilience and Investment Risk

The data is grouped into different time frame based on the three identified between 1985 and 2009. The average (mean) rental level of the value and growth is calculated under each cycle as well as the long-run average of the same period covering the three cycles with extra years up to 2017. The next step is to calculate the standard deviation (Lim et al., 2008) for these periods to provide information about the volatility or stability of market movements during each examined timeframe. The assumption of the normal distribution (Jorion, 1996; Higgins, 2015) is employed to analyse the results of the standard deviations derived from the data set.

For investment, return is one side of the coin; risk is the other (2015, Baum, p22) and growth reflects the probability of positive or negative return. Investment professionals, such as institutional investors, who work with a pension fund or life insurance company, use measures of risk based either on the concept of volatility or on the probability of a potential loss. Volatility is the fluctuation of returns around an average return (2015, Baum, p23). For example, one property (A) might show a 10 per cent return each year for five years. Over the five-year period, it would have shown zero per cent volatility, equivalently standard deviation (SD)=0, as the actual return in each year was the same as the average return. If another property (B) has shown a positive return of 20 per cent for the first two years, followed by a negative return of 40 per cent in the third year and two further years of a positive return of 25 per cent, it would have produced the same average return of 10 per cent per annum. However, the volatility in returns would have been much great, its SD=28.06. This implies the greater the SD figure, the higher risk.

Applying the same rationale of growth reflecting the level of probable return, volatility also could be measured on the fluctuation of growth for a year around the average growth over a certain period. The level of volatility in returns is usually measured in units of standard deviation, which means a measure of the average distance of each observation or data item from the mean of that data. For this research, following the same reasoning, the level of rental growth is adopted instead of returns to measure the level of volatility.

Standard Deviation and investment risk

It is interesting to see the average rental value of regeneration office market is higher than the one for non-regeneration office market by £15.95 to £14.58 (see Table 8), even though, the average rent of regeneration office for the first cycle started with a lower value at £8.4 than £8.85 of non-regeneration office; however, both of the second and third property cycles witness the higher value for regeneration office rent. But the real growth of regeneration office rent between 1987 and 2017 only halves to the non-regeneration market suggesting the greater fluctuations of rental changes for these office spaces meaning a better potential for rental growth which also is reflected in the Figure 9, showing bigger waves in rental growth for non-regeneration office market. Therefore, this explains the importance of analyzing the rental value by using different

evaluation tools and concepts to really understand and assess how office market performs as an investment asset.

Table 8 The average/mean of Rental Value for 4-star office

Average (£)	cycle 1985-1993	cycle 1994-2003	cycle 2004-2009	1985-2017
Rent/NR/4	8.85	13.6	17.78	14.58
Rent/R/4	8.4	14.54	21.58	15.95

The standard deviations of Regeneration office market (see Table 9) for the three cycles indicate that Non-Regeneration office market steadily became less volatile from 2.83 reducing to 2.32 and then 1.51; however, the trends for Regeneration office seem to be different, as the market became more volatile entering the second cycle and then improved during the third cycle with the figure of 1.42, 3.47 and 2.34 respectively. On average, it seems that from 1985 to 2017, Regeneration office market (6.09) is relatively more volatile than Non-Regeneration office market (4.83), suggesting less resilience economically.

Table 9 The standard deviation of Rental Value for 4-star office

Standard Dev	cycle 1985-1993	cycle 1994-2003	cycle 2004-2009	1985-2017
Rent/NR/4	2.83	2.32	1.51	4.83
Rent/R/4	1.42	3.47	2.34	6.09

Competitiveness for Investment

Regional comparison

As attracting investment in property remains an important vehicle for securing private sector involvement (Adair et al., 2005), in assessing the success of a regeneration policy highlighted by the government (Adair et al., 2002; CLG, 2012; DIT, 2016) for promoting sustainable economic development, it is sensible to include this factor. New investment may bring more businesses into the city and this therefore requires more space available which is fit for purpose to be constructed or refurbished. D'Arcy and Keogh (1997a & 1999) define that urban competitiveness refers to the ability of a city to exploit or create comparative advantage, and thereby to generate high and sustainable economic growth relative to its competitors.

Consequently, it is useful to compare the market performance of Manchester to other regional cities. Birmingham and Glasgow are selected due to their role as a regional centre and data availability. For the purpose of this research, the level of investment volume and the movement of rental value are examined.

Investment Volume

Figure 10 exhibits the investment volume for these three regional cities between 2007 and 2016. After the credit crunch occurred in 2007, the investment volume of Manchester office market suffered relatively longer than the other two cities. In 2007, Manchester still attracted more than £700 million to commercial property market but did not recover for six years until 2014 with halved

investment inflow; unlike Birmingham, the City's investment level bounced back to the pre-recession level at around £500 million within two years in 2010; even Glasgow, the volume of the investment by 2010 has gone back 88% of the 2007 level comparing to 52% of the investment capital in the same year for Manchester.

However, with regards to the average of total investment flown into these cities between 2007 and 2016, Manchester secured the highest investment volume of all to nearly £500 million comparing to £400 million for Birmingham and just over £200 million for Glasgow, meaning within these ten years, Manchester has received more total investment capital to its commercial property market than Birmingham (25%) and Glasgow (150%).

Figure 10 Investment Volume (CnW; PIA, 2016)
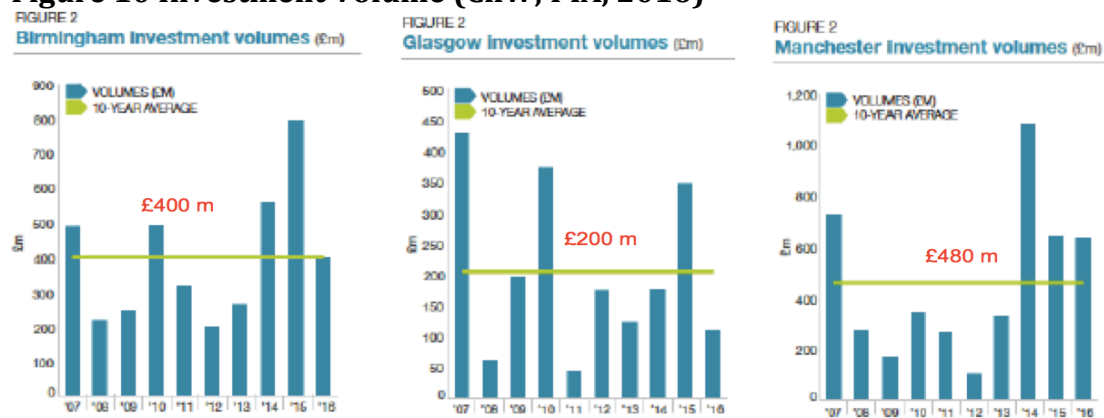
Rental Value of Regional Cities

One of the measurement criteria for competitiveness is the level of rental values. The following chart explains the market movements for the three regional cities selected from 1981 to 2017 based primarily on the CBRE Regional Office Rent Index (1990-2006) comprising estimated rental values between 1980 and 1989 based on the IPD rental growth. Between 2008 and 2017, the data source uses the second half-year CBRE market report for 2017. The definition of rental value in the CBRE report is stated as, "the open market rental value of a rack rented property of a standard specification at the relevant date" (CBRE, 2007). There is no indication of whether these rental values are headline or effective, provable or achievable, and what incentives are assumed. Again, the assumption must be that they are based on headline rental values. Rental growth definition of IPD says that the annual compounded increase in monthly estimated rental values is expressed as a percentage of the rental value.

It is understandable that there may be some inaccuracy of the data sets due to using the estimated figures and two different reports even though both produced by the same source, CBRE and the author of this research ensured that they are consistent in terms of rental values. The main purpose of examining these rental figures is to observe the market movements and economic trends not the accuracy of each rental value.

However, in order to be as accurate as possible, the analysis is divided into three periods: 1980-1989; 1990-2007; 2008-2017 based on the data source.

1. 1980-1989: as it can be seen, the rental value of Manchester office market started at a much lower point than Birmingham and Glasgow in 1981. The similar rental gap between them remained until 1989 and Birmingham evidently outperformed the other two cities.

2. 1990-2007: the 2001 recession seems to affect Birmingham and Manchester marginally sharper that Glasgow but since 1992, the level of rental value in Manchester had caught up dramatically with the other two cities. It reached the same level as Glasgow office rent in 1997 and Birmingham in 2000 but remained slightly lower than Birmingham until 2008 and 2009. The office market in Birmingham took a heavy hit by the credit crunch and recovered slowly since then. However, Manchester office market seemed to sail through the financial crisis without significant loss in the rental value but only with a small but steady growth.

In terms of analyzing the office market, the angle has to be focused on the institutional investors for several reasons. Institutional investors are important shareholders in office market. According to the report published by the Investment Property Forum (IPF) in 2016, offices remain the largest sector in investor portfolios, representing 44% of their total holdings in the commercial property market. Furthermore, institutional investors were one of the largest office holders just second behind overseas investors. They have an influential role on the property market, particularly, prime office market, which is the focus of the data collected in this research.

The level of rental value in Manchester office market reached its equivalent status as to other two cities in 2000 at £24 per square foot and after 2008, the office rent of Manchester became the highest one among them (see Figure 11). From the investor's prospect, Manchester showed a better performance in rental value for a long-term period, which indicates the level of market maturity to secure a better position to compete with other cities for investment funds with greater confidence that Manchester is more likely to deliver a bigger growth in rent. With the proof of attracting the most inflowing investment capital to office market, Manchester just demonstrated its greater capacity to compete with other components in terms of investment.

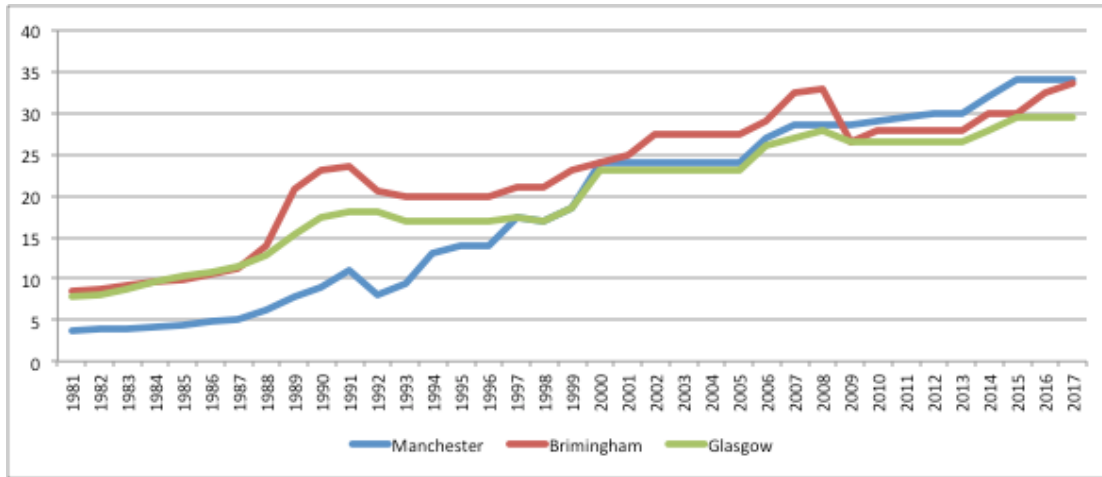**Figure 11 Regional cities rental value compare 1981-2017**

Figure 12 exhibits how these three regional cities performed during property cycles. For the 1985-1992 cycle, Manchester seemed to react to the downturn more severely with the greatest dip in the rental value but then behaved consistently with Glasgow for the 1993-2003 cycle. But then for the latest cycle, Manchester seemed to be affected the least with no downward correction in rental value, which can be seen for Birmingham and Glasgow. This signals that the capability of Manchester office market to deal with economic shock like this became better and more resilient.

Another positive sign for stronger economic resilience is to look at how quickly and well a market could bounce back after the downturn of a property cycle. After a deep cut in the rent around 1992, the speed of recovery in Manchester office market was the fastest one among three. This also applied to the recovery after the credit crunch; all three cities took an uplift turn around 2012 but Manchester demonstrated the strongest growth up to 2015. This indicates Manchester is more competitive due to its advantage of economic resilience.

Figure 12 Cyclical changes of rental values for regional cities
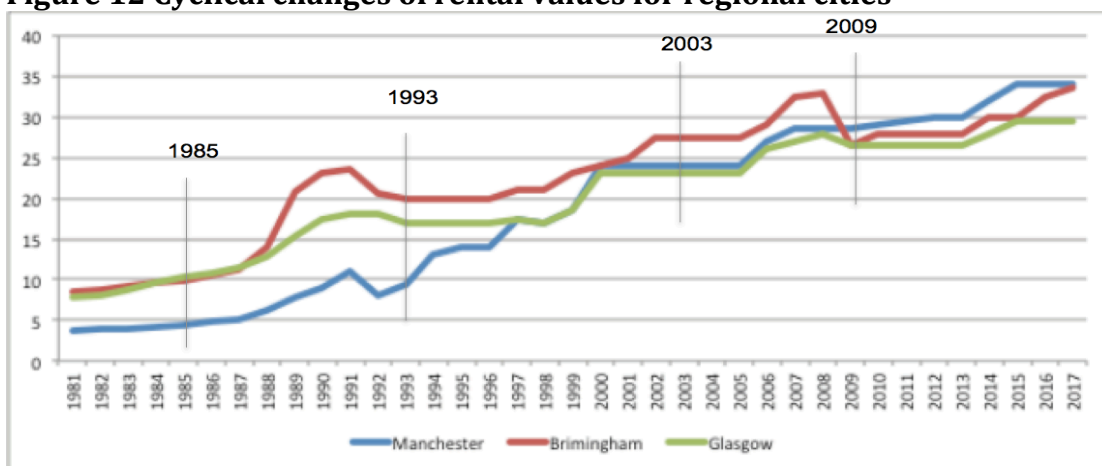
Conclusions

Section 5 presents the conclusions of the findings derived from the quantitative data analysis categorized under the three measurement indicators of market sustainability with five measurement variables comprising Rental Values, Rental Growth, Investment Volume, Investment Risk - Rental Values, and Rental Value (See Table 10).

Table 10 Measurement variables and indicators

Market sustainability indicator	Measurement variable
Market Maturity	• Rental Values (RV) • Rental Growth (RG) • Investment Volume (IV)
Economic Resilience	• Investment Volume (IV) • Investment Risk - Rental Values (IR - RV)
Competitiveness for investment	• Investment Volume (IV) • Rental Value (Regional cities)

The evidence of rental value movement between 1984 and 2017 shows that regeneration market has become more mature particularly after 1998 with steadily stable trends. This also applies to the change of rental growth. Even though there were some inconsistent movements but only for a relatively shorter time span. Within the timeframe of the three property cycles, it can be observed that the rental value of regeneration properties after 1997 became more closely aligned with that of non-regeneration properties indicating a sign of market maturity. Also, the higher level of consistency in the rental value of regeneration properties shows less volatility in price change compared to non-regeneration properties. After 1998, the change of rental growth for both regeneration and non-regeneration markets appears to track the general cyclical market movements showing the Manchester office market becoming more mature.

The fact of regeneration office rent outperforming strongly for almost twenty years could attract more investors to invest in regeneration market but this could be offset due to the real growth of regeneration market looks less competitive to the non-regeneration one. The lack of sufficient property data between 1987 and 1997 shows that the office market has not reached its mature state. After 1998, there seems to be more transactional data indicating greater depth of market maturity. The healthy volume of market transactions in regeneration areas suggests the improvement of efficiency in market information as well as sustainable market activities. This could also improve the confidence of future investors.

The evidence indicates regeneration office market is less economically resilient due to the higher possibility of being exposed to greater investment risk. But Manchester office as a whole seems to be relatively resilient comparing to the other two regional cities based on its better capacity of recovering from a cyclical downturn. Manchester office market shows greater economic resilience because it recovered quicker during the second and third property cycles. Also Manchester demonstrated the strongest growth up to 2015. This indicates Manchester is more competitive due to its advantage of economic resilience.

Looking at the long-term performance during the targeted period, Manchester overtook the Birmingham and Glasgow market after 2008 and 2009. This exhibits Manchester became more favourable with regard to external investment competing to the other cities. Manchester proves its competitive ability to draw in investment money by securing £480 billion annually between 2008 and 2017 with one of the highest office rent among these regional cities.

Regeneration office market in Manchester city centre demonstrates overall economic sustainability with assistance of Manchester as a city to be more resilient economically and competitive for investment.

The limitation of constructed property database and indices

Apart from the data limitations mentioned as above, the author acknowledges that there was a range of uncertainty attached to the out-turn figures which were at best variables of the size and patterns within the property market rather than representing a definitive picture.

Appendix 1 The CoStar Building Rating System: 5-star and 4-star office

RATING	GROUP		DEFINITION
⭐⭐ ⭐⭐⭐	A 5-Star office building is exemplary of a state-of-the-art, category defining structure that represents the latest trends and quality in design and construction, prominent in its context or of a landmark status, and very likely a certified sustainable and energy efficient building. Buildings rated to exhibit the nation's current set of highest quality structures and form the benchmark of current excellence in office buildings.		
	Architectural Design	Exterior Materials/ Façade	High-quality durable materials – natural stone, glass, well detailed metal panels; accentuating lighting.
		Lobby/ Common Areas	Double height or atrium lobby with top quality finishes/materials and artwork, clear and intuitive layout for visitors, comfortable waiting area, accentuating lighting, high level of finish in other common areas and elevator cabs/lobbies.
		Fenestration/ Glazing/ Views	Full height glass, corner windows, abundant natural day lighting, generally available exterior views, high ratio of glazed to opaque exterior walls, highly efficient glazing specifications.
		Overall Aesthetics	Positively differentiated from background buildings yet contextually appropriate. Representing current trends and standards in design and/or of a timeless, perhaps a historic quality. Aesthetically exceptional arrangement of forms, massing and materials. Likely designed by a notable or signature architect.
		Access	Clearly articulated entrance identified with an architectural feature; truck and service entrance distanced from main entrance.
	Structure/Systems		High ceiling heights/slab-to-slab dimensions, efficient and virtually column free floor plans; modern energy-efficient HVAC, digitally controlled building automation systems, individual control/VAV units, efficient elevators with continuous shafts serving parking levels and upper floors, dedicated freight elevator. These buildings are likely to be constructed recently or undergone a significant renovation.
	Amenities/ Management		Concierge, on-site management, fitness center, services (dry cleaning, shoe repair, etc.), security with streamlined ID and badging process, on-site conference facilities, bicycle storage, shower facilities, and other highly demanded amenities.
	Site/Landscaping/ Exterior Spaces		Continually maintained landscaping where applicable; exterior gathering spaces, roof terrace or courtyard.
	Certifications		Very likely a certified/labeled green and energy efficient building.
	At a minimum level, a 5-Star building typically includes the following: exterior materials listed above, a glazing ratio of approximately 75%, 12' slab-to-slab dimension, a column free floor plan, a regular floor plate shape, and multiple desired amenities.		
⭐⭐⭐⭐	A very high quality building that maintains market leadership through the strength of its initial construction, continual above average maintenance and desirability for tenants and investors over time, These buildings are likely to be older than the current 5 Star set.		
	Architectural Design	Exterior Materials/ Façade	High-quality durable materials – likely similar to 5 Star type yet possibly exhibiting signs of age and wear.
		Lobby/Common Areas	Large lobby with clear circulation, above average finishes, comfortable waiting area.
		Fenestration/ Glazing/Views	Full height glass or ribbon windows/large punched windows, great natural day lighting and views.
		Overall Aesthetics	Positively differentiated from background buildings yet contextually appropriate. Representing recent trends and standards in design and/or of a timeless, perhaps a historic quality.
		Access	Clearly articulated entrance identified with an architectural feature, truck and service entrance distanced from main entrance.
	Structure/Systems		Likely to have some 5 Star qualities, or of a prior generation of buildings.
	Amenities/ Management		Likely to have some 5 Star qualities, possibly without service oriented amenities.
	Site/Landscaping/ Exterior Spaces		Well maintained landscaping where applicable; likely to have exterior gathering spaces, a roof terrace or courtyard.
	Certifications		Likely a certified/labeled green and energy efficient building.

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