

MASTER THESIS – ERASMUS UNIVERSITEIT  
ROTTERDAM



## THE REALITY OF LEGACY

URBAN TRANSFORMATION & THE ECONOMIC IMPACT OF THE LONDON  
2012 OLYMPIC GAMES

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## Abstract

**The Reality of Legacy: Urban Transformation & the Economic Impact of the London 2012 Olympic Games** is an academic Master thesis which explores the reality of the urban regeneration of East London as spurred by the 2012 Games. The dichotomous concept of Olympic legacy is evaluated from its linguistic beginnings at the Montreal 1976 Olympic Games to its centrality at the London 2012 Olympic Games. The overarching research question is: *What is the reality of Olympic Legacy?* This is supported by two further research questions. Firstly, it is asked how, *as a conceptually broad, yet central tenant of the Olympics, how has legacy been exhibited in past Olympic Games?* Thus, Section I is a qualitative analysis of the legacy of five landmark Olympic Games: Montreal, Los Angeles, Barcelona, Atlanta and Athens. The conclusion of Section I is that the historical evolution of legacy has been centred on its malleability and it is now inextricably intertwined with the modern Olympics; one cannot exist without the other, never more the case than with London 2012.

Upon this rich foundation, rests the second research question: *did the regeneration of Stratford as part of the London 2012 Olympic lead to direct benefit of the community as reflected through a change in local house prices?*

Section II thereby presents a quantitative study focusing specifically on the real estate market of the London Borough of Newham. A hedonic pricing model is built, using a range of house- and neighbourhood- characteristics for transactions between 2007 and 2015. It is concluded that there is a statistically significant proximity premium relating to the Queen Elizabeth Olympic Park extending to approximately 3km from the centre of the Park. Furthermore, there is evidence of negative externalities within the immediate proximity of the park and a positive influence on transaction prices as a result of the April 2014 reopening. The key findings of the study are discussed before the various limitations of the methodology employed are acknowledged. Lastly, the scope for further study is explored, particularly the need for retesting within a different spatial context in order to ensure the credibility of the statistical methods employed.

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## 1. Introduction

*“So this summer is going to be obviously a magnificent sporting event. We’re going to be celebrating the medals, the heroes, the heroines. It will be inspirational. But we’ve got to make sure that these are the inspirational Games for the future. Really making the most of them, we have got to make sure this inspiration is about more than a one-off, one summer wonder.*

*It can be so much more. It can be one of those really special moments in our national story. A time that caught the mood. A time that lifted us. A time that created something amazing.”* (Cameron, 2012) – David Cameron on the Olympic legacy at Loughborough University on Thursday 5<sup>th</sup> July, 2012.

A ‘one-off summer wonder’. On many occasions, the Summer Olympic and Paralympic Games and their four weeks have failed to be anything more than that; a ‘one-off summer wonder’, a one-off socio-economic phenomenon which leaves no trace other than emptiness. Empty stadiums looming over the skyline, an equally empty state wallet and an empty Olympic legacy. There is a growing quantity of documented accounts on the transiency of the Olympic Games and this has spurred a transition in the mind-set of the various organising committees who have stepped up to the plate with each Olympiad. Whilst the earliest iterations of the modern Olympics were low profile and “left no footprints” (Cashman, 1998, p. 108), by the Stockholm Games of 1912, ‘legacy was built to last’ (Cashman, 1998, p. 108). And so, the Olympics became the spectacle that they are today; the world’s most attended, viewed, participated and prestigious sporting event (Slater, 2014) (Essex & Chalkley, 1998). With origins in Ancient Greece it is now one of the longest-standing sporting events in human history and has been transformed from a Hellenic tribute to the Gods of Olympus into a global celebration of sport which often brings a whirlwind of change to the city upon which the rights to host are bestowed.

Now couple this with what is arguably the Olympic city of the modern age; London. It is the world’s most powerful city (MMF, 2015), an Alpha++ world city (Beaverstock, Smith, & Taylor, 1999) and a financial capital comfortably brushing shoulders with Tokyo and New York. There is subsequently little doubt that the partnership between the world’s greatest city and the world’s greatest sporting event was bound to be a sweet one. London’s position as *the* Olympic city, though subjective in nature, is supported by the following fact: London has bid to host the Games only on three occasions and was ultimately successful each time, granting it the distinction of being the only city to have hosted the modern Olympic Games three times; 1908, 1948 and 2012.

The Olympic Games of recent years are one of the most transformative spectacles to befall a city and there is a substantial and protracted history of “cities using the Games to obtain some lasting physical benefit” (Thornley, 2012). As a significant catalyst for urban change (Essex & Chalkley, 1998), the arrival of the Games brings the eyes of the world, its people and most importantly their money. When the Games depart, cities are often left with new infrastructure, new facilities, new parks, and new districts. These shiny new toys do not come for free and indeed, with the Olympics increasingly costing more and more, their financial justification often relies on this accompanying “programme of regeneration and improvement” (Essex & Chalkley, 1998). This ‘regeneration and improvement’ is termed

'Legacy', a word that will appear with ever-increasing frequency throughout this thesis. Indeed, Gold & Gold (2008) acknowledge the peculiarity of such an "ordinary English world...becom[ing] so central to Olympic discourse" (pg. 9).

Legacy is defined in the dictionary as "something left or handed down by a predecessor (OED, Legacy, 2016)" Whilst it most commonly is used in reference to the bequeathing of an inheritance, in the context of the Olympic Games, that *something* which is left or handed down is often conceptually broad, fluid and erratic. It can at once refer to the sporting culture left behind which inspires a generation to go on to win medals, trophies and championships, whilst simultaneously referring to the brand new metro line running beneath the city streets. It can mean the wealth of facilities handed down by a predecessor whilst also referring to the crippling debts left in its wake. It is both tangible and intangible with measurable outputs and immeasurable outcomes. This conceptual elusiveness exacerbates the difficulties involved not only in its creation, but in its assessment and with such a wide remit encapsulated by the term 'legacy', assessing the entire legacy of an Olympic Games in a qualitative and cardinal sense has remained an unfeasibly challenging task. Nevertheless, unfeasible has never been enough to stop researchers, and a substantial number of papers have been written on both the concept and its measurement.

Richard Cashman (1998) makes effort to make clear the conceptual breadth of legacy, presenting the various forms it can take; "almost every Olympic city has some form of legacy whether it be in the form of buildings, monuments, art, galleries and museums, repositories and archives, stamps, souvenirs, memorabilia, plaques and even street names" (pg. 107). This list does not end with the tangible; Cashman draws attention to the other side of legacy bringing to light the "local Olympic champions who are living reminders...the oral memories and stories...treasured by individuals...the more mundane debts". Cashman also acknowledges the vast levels of variances in Olympic legacies, sometimes a single Olympiad apart, contrasting the 1896 restoration of the ancient Panathenian Stadium in Athens to the 'footprintless' legacy of the 1900 Paris Olympics with "no monuments and little memorabilia". Praising the former and condemning the latter, he catalogues the ever more "extravagant attempts to create permanent Olympic monuments and precincts" ranging from the failed Olympic Stadium of Montreal to the citywide enhancement of Barcelona. He states, in conclusion, that legacy is a neglected area in need of a more systematic and sustained analysis.

As the most tangible and long-standing form of Olympic Legacy, the stadium deserves special attention. Their place within the city has varied from being utilitarian structures surrounded by a "moat of surface parking (Baade & Dye, 1990)" to "architectural symbols with tourist appeal...built into the urban fabric to facilitate synergy (Santo, 2005, p. 178)". This heterogeneity of placement inspires a dichotomous empirical response to the debate on the economic outcomes of stadium investment. Siegfried & Zimbalist (2000) declare an unanimity to the findings; "there is no statistically significant positive correlation between sports facility construction and economic development (p. 98)", a sentiment echoed by Baade (1996) - "The overwhelming consensus... is that the local economic effect of a sports facility is between non-existent and extremely modest (p. 15)". Extremely modest, yet to this day millions of (public) money is spent on the construction of sports facilities, often in the form of subsidies. Contradicting the above, impact studies tellingly commissioned by sports franchise owners vying for subsidies speak of "hundreds of millions of additional tax revenues and income... thousands of new jobs (Coates & Humphreys, 2003, p. 5)". Additionally, cities can anticipate spending by spectators, vendors, media teams etc. that would not occur were it not for the

existence of the facility (Crompton, 2004). Santo proposes a recasting of the analysis – a rerun of past studies with updated data on the more recent generation of stadiums – to a new, more positive conclusion. The results are mixed, the crucial outcome being that context matter; where stadiums are well integrated into the urban fabric of a city they can encourage ancillary spending before or after the games therefore benefiting the local economy. Still, the results are not conclusive and with opposing and contradictory conclusions as to the economic impact of stadiums on the urban area it becomes ever more apparent that further study is required.

## 1.2 Research Questions & Aim of Study

This impact of stadiums, however inconclusive, falls under the umbrella of legacy. As has been demonstrated, it is without a doubt the most important feature of the modern Olympic era. As a term it has assumed magical properties in Olympic circles (MacAloon J. J., 2008) and is now an ever-present element in current debate about cities staging the Olympics as well as the touchstone for measuring their worth (Gold & Gold, 2008b). A central tenant of the London 2012 Olympic Games was that “By staging the Games in this part of the city, the most enduring legacy of the Games will be the regeneration of an entire community for the direct benefit of everyone who lives there” (LOCOG, 2005). Displaying foresight, the Department for Culture, Media and Sport (DCMS) anticipated the need to investigate the post-Games legacy of the Olympic Games and with eleven presented areas of inquiry, focus is given to the sixth: *to analyse whether or not Games-related development delivers a regenerated Lea Valley and East London and draws to related regeneration projects, for example, in the Thames Gateway.*

Hence, the aim of study within this thesis will be to assess this regeneration and thereby determine the effect of the London Olympic Games on the transaction prices of properties in the London Borough of Newham. Whilst there are indeed empirical studies on the dynamic by which sports-facilities and their accompaniments can impact the urban economy, results are often inconclusive and in need of further study.

In evaluating the legacy of the London 2012 Olympic Games, the principal research question of this thesis asks, as is reflected in the title,

*What is the reality of the Olympic legacy?*

This question simply considers the reality of what is one of the most driving influences in the Olympic discourse. In a period of *'fake news'* and *#alternative facts*, it is evermore essential to scrutinize the actual, as opposed to idealistic. The idealistic has its appeal; it is positive, it is utopian, it imagines an outcome which, in the right hands can be used to inspire. Yet, at its core, it is essentially impractical and this impracticality is its downfall. The hyperbolic nature with which Olympic organisers regard legacy leads to often insubstantial justifications for vast expenditures. In the context of the Olympic legacy, this research question therefore aims to disengage the fantasy from reality. This is a complex challenge – forcing more difficult questions of defining legacy and its quantification and therefore, an additional pair of more exhaustive research questions are proposed, each with its own resultant section.

The first of this pair acknowledges that, in order to understand the reality of legacy, its incidence in past Games must first be understood and therefore research question I asks -



*As a conceptually broad, yet central tenant of the Olympics how has legacy been exhibited in past Olympic Games?*

In order to answer this question, section 1 of this thesis will be a qualitative analysis of the legacy of five past landmark Olympic Games, performed through an in-depth literature review. The review will provide an understanding of the historical context, the intended legacy and the 'reality of legacy'. Each Olympic Game chosen is known for their standout legacies, ranging from the positive to the negative.

The five Games under the microscope will be:

- The 1976 Montreal Olympic Games
- The 1984 Los Angeles Olympic Games
- The 1992 Barcelona Olympic Games
- The 1996 Atlanta Olympic Games
- The 2004 Athens Olympic Games

The provision of an understanding of how legacy has been expressed in past years is a cogent foundation upon which to evaluate the legacy of the London 2012 Olympic Games. And therefore the empirical core of this thesis will allow for a substantive effort to be made towards a "full and rigorous longitudinal evaluation of the legacy from an Olympic Games" (Gold & Gold, 2011, pp. 8). Research question II is subsequently:

*How successful was the intended legacy of the London 2012 Olympics and in particular, did the regeneration of Stratford as part of the London 2012 Olympics lead to direct benefit of the community as reflected through a change in local house prices?*

In order to answer this question, section II of this thesis will be a quantitative study of the economic legacy of the '*Games of the XXX Olympiad*' held in London in the summer of 2012. As will be established in section I, legacy can take many different forms and the LOCOG had well-publicised ambitions of transforming the East End of London. This transformation was centred on Stratford, the centre piece being the large-scale construction of the Queen Elizabeth Olympic Park and its constituent sporting facilities. With infrequent documentation of relationship between sports facilities and local housing markets, the empirical study will aim to determine the 'direct benefit to the community' through the construction of a longitudinal hedonic pricing model of transactions within Olympic host borough, Newham. A hedonic pricing model treats the value of the final good (in this case the transaction price of a residential property) as a dependent variable. The property is then regressed upon its attributes; its physical characteristics such as date of construction, and the UK-centric number of bedrooms, and also neighbourhood attributes such as the accessibility of the property, local crime rates and the availability of urban amenities. Through this method, the intrinsic value of each of these attributes can be determined and furthermore, the transaction prices can be predicted (Monson, 2009). By accounting for the house and neighbourhood level characteristics amongst the residential dwellings within Newham, the specific Olympic-driven influence on the housing prices will be separated from that of the house characteristics.

Every city has a core set of objectives as to why they should host the Olympic Games. These objectives vary between each iteration of the Olympic Games but recent decades have exposed a trend towards the strengthening of the urban economy through regeneration and urban redevelopment. As stated above, 'there is a need to analyse whether or not Games-

related development delivers a regenerated Lea Valley and East London' and therefore, by undertaking this study, there is the aim of providing an answer to this essential question. With regards to existing literature, research abounds on the economic impact of Olympic Games, with authors investigating the primary, secondary and tertiary economic impact through the oft-mentioned multiplier effect. In addition to this there also exist more specific studies, burrowing in to an assessment of the cultural benefits, the environmental repercussions, the societal impacts of hosting the Games. It is this literature that will form the basis of Section 1 of this thesis. The second half of this will focus purely on the impact on housing prices. Whilst this thesis is not the first empirical study addressing this dynamic, there is a noticeable dearth of literature as to how sports facilities, particularly Olympic stadiums, will influence local real estate markets. This topic is alluded to in the work of Dennis Coates (2007); amongst a run-down of the theoretical benefits of stadium construction is its position as a valued amenity by residents "in the same way that clean air, good public schools, and low crime are desirable attributes of a city (p. 570)". Hence, it is argued, that in line with Glaeser's (2001) theory on urban amenities, this increased valuation will lead to an amenity premium, and most importantly, a subsequent willingness to pay in the form of higher house prices. Further studies focus specifically on magnitude of this premium, utilising, as within this thesis, hedonic pricing models to varying conclusion.

Returning to London, the core assumption within this thesis is that the development of the Queen Elizabeth Olympic Park and its constituent sports facilities transpire to be urban amenities, having injected substantial investment into the borough of Newham and therefore it is not a stretch to assume that this will have led to a change in house prices in the locality, if not across East London. The assumptions in place here are that this price change will be positive and more specifically will be of greater magnitude in the direct vicinity of the Park.

There is a rising consensus that the hosting of the Olympics is no longer, or was hardly ever the economic elixir it was thought to be; that the reality of legacy is often so far from that which is planned by the organisers. This thesis, through the analysis of London, will provide some clarity on this. The intended legacy of the London 2012 Olympic Games was the regeneration of an entire community for the direct benefit of everyone who lives there: this thesis will determine the reality of this legacy.

## 2. Section I: A Literature Review

*'What is the reality of the Olympic legacy?'* is a deliberately open question, posed exactly like this to reflect its conceptual breadth. From the English 'legacy' to the French 'héritage', a spectrum is present ranging from the commonly recognised aspects of architecture and sports infrastructure (IOC, 2003) to the lesser mentioned "cultural values, popular memory. "Buildings, monuments, champions, stories, debts" (Cashman, 1998); the list is extensive, leaping about from the tangible to the intangible, the miniscule to prodigious, the fleeting to the immovable. This breadth brings theoretical challenges, its categorisation an ever-present obstacle; the aforementioned Cashman (2005) proposing six sub-genres (sport, economics; infrastructure; information and education; public life, politics and culture; symbols, memory and history). With a myriad of possible means of classification, it is important to place some constraints upon the dimensions through which legacy can be exhibited. Furthermore, by consistently structuring the forthcoming evaluation of historical legacies a more comprehensive analysis will be attained, and it is critical that this structure sufficiently addresses the research question of this thesis.

Again, *"What is the reality of the Olympic legacy?"* As such a commonplace word, its ascension within the Olympic movement is in part influenced by its vagueness and subsequent adaptability. Embellishing the 'tangible/intangible' distinction of Cashman, John R Gold and Margaret M Gold (2008) bring to light further dimensions; the planned and unplanned dimensions of legacy and the positive and negative, (for example, improved infrastructure in the case of the former, debts for the latter). They chart the lexical history of legacy in Olympic documentation and its rapid transition from an implicit and unintended consequence to an explicit and incidental feature of the Olympic Games, acknowledging that it is a 'constantly evolving concept' and that the difference in perspective between the International Organising Committee (IOC) and the host city shapes this evolution. Indeed, whilst the IOC is forced to consider legacy at an arm's length the host city is required to embrace and approach it in a more forthright manner.

Before evaluating the incidences of legacy in the past, this section will begin with a brief overview of the historical context of the Olympic Games from its atavistic beginnings through to its modern reincarnation. This will be followed by a tracking of the rise of legacy as an integral tenant of the Olympiad planning process. The following sections will then present a chronological assessment of the chosen Games:

- The 1976 Montreal Olympic Games
- The 1984 Los Angeles Olympic Games
- The 1992 Barcelona Olympic Games
- The 1996 Atlanta Olympic Games
- The 2004 Athens Olympic Games

A study of the Olympic Games cannot be undertaken without an understanding of the historical beginnings of what is now the world's most watched sporting event and therefore it is import to commence at the beginning; Ancient Greece.

## 2.1 Welcome to Olympia

*“The Olympic Games are a pilgrimage to the past and an act of faith in the future”*

*Pierre de Coubertin, Founder of the Olympic Movement*

As with all from time immemorial, at the centre of the Olympic Games were the Gods – or in this case, a demi-God. Heracles, son of Zeus, established a celebration of sport as a tribute to his father after a military victory. Thus titled the ‘Panhellenic Games’ (*Pan* = all, *Hellene* = Greek), the Games, as documented by Homer were held every four years in Peloponnese, west of modern-day Athens. In the politically tumultuous environment of the day, the Games acted as a unifying event, bringing together approximately 40,000 citizens and also establishing an ‘*Ekecheiria*’, a sacred truce between the warring Greek city-states; this mandate of peace allowing safe and uninterrupted travel by participating athletes to and from the games.

With the tradition set in place, the ‘*Olympic Millennium*’ began, a thousand-year period in which Greeks and Romans came together in Olympia to compete in honour of their ancient Gods and also for personal honour - champion athletes being amongst the most esteemed members of ancient Greek society.

Ultimately, it was the symbiosis between the Games and religion that brought about its downfall. In approximately 393 A.D, Roman Emperor Theodosius banned the Games in a decree against pagan cults. The site was abandoned, millennia elapsed; the Games were buried – the temples and statues destroyed by earthquakes and the ravages of time, the concept confined to the writings of ancient historians.

This confinement was lengthy and it wasn’t until 1776 that the ancient site of Olympia was discovered by English traveller Richard Chandler. Even with this discovery a further century still elapsed before archaeologist properly explored the site and sunlight fell upon the ancient stadium of Panathinaikos again.

Bringing the Games out of the annals of history fell upon the shoulders of Pierre de Coubertin. Born in Paris in 1863, Coubertin was awed by the archaeological discovery of the until-then lost arenas of the Panhellenic Games, when displayed at the Universal Exhibition in Paris in 1889. An early attendance at the modest Wedlock Olympian Games in rural Middle England combined with the inspiration of the sporting culture of English private schools fed a dream in Coubertin’s mind, a dream that was eventually realised with a closing speech at the 1892 conference for the Union of French Societies of Athletic Sports. Later termed the ‘*Olympic Manifesto*’, Coubertin used this speech to launch the idea of the Modern Olympic Games and with the Latin motto ‘*Citius, Altius, Fortius*’ - “Faster, higher, stronger” – this new iteration of the Panhellenic Games began again.

The first of Coubertin’s Olympic Games took place in their rightful and historical home of Athens in 1896. Opened by King George I, the Games of the I Olympiad lasted 9 days, with 241 all male athletes participating across 43 events. The transition from vision to reality was not an easy one, which was rife with political and financial stability. With costs running well past previous estimates it took grassroots donations and business sponsorships to get the first Games of the Olympiad off the ground. However, with 80,000 attendees packed in to the restored Panathinaikos stadium, the Games attained a level of success which cemented their future. The newly instituted International Olympic Committee (IOC) subsequently mandated that the Games would occur every Olympiad and the 4-year tradition of the Games was born.

## 2.2 The Modern Day Olympic Games

The Panhellenic Games were rooted in an ethos of honour, unity and victory, encapsulated by the Greek concept *'Kalokagathia'*, a combining of “beauty with goodness, morality with beauty” (Takács, 1992). Lacking the religious oaths, offerings to Zeus and slaughter of oxen of the Games of Olympia, the modern Olympic Games as revived by Coubertin were a broadly secular event. The differences did not end here: whilst the ancient Games were based solely at the Olympia site, the modern Games were geographically transient, moving around the globe with each iteration, and in contrast to the 5-day span of old, the modern Games take place over a 16-day period. Further evolutions were the participation of women from 1900 onwards and the creation of a second event, devoted entirely to ice and snow events, the Olympic Winter Games. Lastly, from 1984 the Olympics were no longer exclusively for amateur athletes with professional athletes finally permitted to participate.

Despite these changes, many integral aspects of the original Olympic Games were preserved for its reinstatement. The Panhellenic Games acted as a unifier between the Greek states and in the 20<sup>th</sup> Century, the Olympic Games brought together nations from across the globe all in the name of sport and upholding international relationships.

Celebrated every Olympiad bar 3 (due to global war), there have been 31 Olympic Games across every inhabited continent except Africa. Now, with over 10,000 athletes participating in 302 events, it has been transformed from a ritualistic ode to the Gods into a global celebration of sport. It is now the largest sporting event in the world; participants number in the thousands, attendees in the millions and viewers in the billions. An event of such scale, thus has a substantial and far-reaching impact on the host city. As each host city is different with varying priorities and circumstances, this impact also varies (International Olympic Committee, 2013). It can be positive or negative, short or long term, tangible or intangible, direct or indirect, intended or unintended, benign or malign (Mangan, 2008).

The 1992 Barcelona Olympic Games is one example of an Olympic Games that achieved a positive impact. Indeed, “the best Olympics regenerate neglected districts, inspire children to take up sport and leave a city furnished with world-class venues and rolling in Olympic dollars” (Usborne, 2008) and Barcelona exemplified this; the Olympics are credited with transforming the urban landscape of the city and assisting its ascension to the seventh best city brand in the world (CBI, 2007). A monumentalisation process involving the establishment of imageable buildings coupled with a beachfront regeneration led to a highly photogenic city with a strong city image (Balibrea, 2001). The resulting impact of the Barcelona Games did not stop with the urban fabric of the city. Spain’s sporting ‘Golden Age’, Nadal, Sastre and the national teams’ victory at the European Championship is often traced back to both the inspiration of the 1992 Games and the plethora of high-quality facilities left over by the Games.

On the flipside, for every Barcelona, there is a Montreal. With C\$1.6bn of debt, a string of corruption scandals and a substantial economic slowdown, the “40 year hangover” (Todd, 2016) of the Montreal Games will not be easily forgotten. Whilst the Olympics provided a facelift for Barcelona in the name of a new beachfront and iconic buildings, in Montreal’s case the city was left with a useless and expensive stadium and a price-tag 13 times higher than planned. Intentions were for a modest and inexpensive Games, with Montreal Mayor Jean Drapeau declaring “The Olympics can no more run a deficit than a man can have a baby”.

Whilst the latter never came to pass, the former became an embarrassing eventuality, the Montreal Games running a deficit unseen by any other Olympic Games. Construction delays, union strikes and widespread corruption, boycotts, enlisting of the army and doping accusations. The Montreal Games' impact on the city was a debt that took over 30 years to pay off. The stadium, on paper presented as a space-age masterpiece, remains an inescapable reminder of the failure that was the Games as it has sat empty since 2004 and was so poorly planned that it cannot be used in more than 3cm of snow, damningly inadequate for a city with 50cm of monthly snow each winter.

These impacts, the good, the bad and the ugly, are all facets of the concept of legacy. Encompassing a broad range of cultural, economic, educational and political outcomes (Llewellyn, Gleaves, & Wilson, 2015) it captures the inspiration left in the hearts of citizens, the new infrastructure criss-crossing the city and it also captures the venues left derelict and abandoned.

In London's case, the objective of the Olympics was to "Transform the heart of the East End of London for the direct benefit of everyone who lives there" (Growth Boroughs, 2008). As stated earlier, the primary goal of this thesis is to assess the reality of this legacy and in order to do this there must first be an understanding of how and why the Olympic Games has become so intertwined with the concept of legacy and how this buzzword has become such a mainstay in historic Olympic literature of the last century.

### 2.3 Legacy and the Olympic Games

*"An important role of the IOC is to promote a positive legacy from the Olympic Games to the host cities and host countries"- Rule 2, Article 14 of the Olympic Charter*

Prepping for the Olympic Games takes decades. The Games themselves last weeks. The post-Olympic period can last a century and yet, despite this, it is often the least planned and articulated of the three (Cashman, 1998). As one of the most substantial civic expenditures a city can make there is risk of community opposition and as a result, convincing the public and allaying citizen opposition is of great concern. In the run up to Vancouver's ultimately successful bid for the 2010 Winter Olympic Games, much was done to build a supportive plebiscite. Implemented to avoid the perception of the bid as an initiative by the elites (Hiller, 2013) all city residents were given the opportunity to express their opinion. Residents were more than just observers to the Games and actively had a hand in its coming about. The message pushed was one of optimism; the Olympics were 'in the best interests of the city' and it would be "[Vancouver's] time to shine" and with heavy-hitters of local business and the sport community coming together on the 'Yes side', 'Team Yes 2010' crushed the 'No Games 2010' campaign 64 to 36 percent. The main weapon of the Team Yes arsenal came in the form of a crystal ball. As with many Olympics of the last decade, politicians and councillors suddenly found themselves fortune tellers, publishing papers, making speeches and presenting graphics full of visions of a post-Olympics future in which citizens' lives are changed, the urban landscape transformed. With the Games come tourists, their footfall and their money. Jobs will be created, businesses will flourish and the treasury coffers will be filled anew. The eyes of the world will be on the city and everybody will see it as the global metropolis it is. It is through this rose-tinted view that councillors and government officials justify the colossal investments behind staging the Olympic Games. This is not limited to the Olympic Games. In the US, the provision of sports league facilities has often relied on the use

of taxpayer finance with franchises successfully luring state and local government officials into rabid competition to build stadiums and arenas with the team subsequently retaining most, if not all of the generated revenues (Siegfried & Zimbalist, 2000). In the 1990's alone, \$21.7 billion was spent on 95 stadiums and arenas, with the public funds contributing nearly two-thirds of this total. This scenario, in which public expenditure is accompanied by public support, can be perceived as surprising. For sports franchise owners, such expenditure makes sense; sports facilities can function as "important engines of economic development in the urban area" (Coates & Humphreys, 2003) contributing millions to the economy, boosting employment and successfully kick-starting urban regeneration. Non-pecuniary benefits are also promoted; the enhanced community image which purportedly acts as a beacon of prosperity, attract businesses, conferences and elevates the position of the city in the global hierarchy.

This abundance of urban success has become the crux of the Olympic proposal. The future legacy of the Games and the Olympics themselves have arguably become so tightly intertwined that the presentation of legacy is central to getting the Games off the ground. The IOC now sees the active promotion of an explicit legacy as part of its mission (Gold & Gold, 2008b), with IOC president Jacques Rogge stating that "Legacy is our *raison d'être*" (CCGA (Chicago Council on Global Affairs), 2007). According to Rogge, "Once an Olympic City, always an Olympic City. Wherever the Games have appeared, cities are changed forever". Whilst Rogge makes little distinction regarding the direction of this change, there is a large element of truth to his statement. In recent years each Olympic host has presented fully-fledged plans for the post-Games legacy and whilst the level of success of implementation is questionable, it often is not for lack of trying.

#### 2.4 Research Question I

As established earlier, the overarching research question of this thesis is *What is the reality of legacy?* In order to better answer this, the first of the two research questions asks *how as a conceptually broad, yet central tenant of the Olympics has legacy been exhibited in past Olympic Games?* This requires looking to the past and thus, the next section of the literature review will provide a historical presentation of five standout Olympic legacies.

The legacies will be presented chronologically as follows:

- The 1976 Montreal Olympic Games
- The 1984 Los Angeles Olympic Games
- The 1992 Barcelona Olympic Games
- The 1996 Atlanta Olympic Games
- The 2004 Athens Olympic Games

The five Games to be analysed have been selected for their standout legacy ambitions and realities, both positive and negative. Montreal is known as one of the most financially crippling Games in recent decades, with a repayment period lasting decades and a profound impact on Canadian political proceedings in following years. Los Angeles is often cited as the model of financial sustainability - the first of the modern Olympics to make a profit. Barcelona is the exemplar Games, "effectively restoring the Summer Olympics as the acme of desire for place promoters and urban regenerators" (Gold & Gold, 2008a). The centennial 1996 Atlanta Games saw the Los Angeles model of financial sustainability expanded to its extremes, unleashing the full force of commercialism much to the ire of the IOC. Finally, Athens saw the return of the Games to their historical birthplace and also brought with it the beginnings of the Greek debt crisis.

Any assessment of past legacy must correctly address the research question of this thesis and therefore a framework has been chosen which sufficiently confronts the challenges involved in evaluating the reality of legacy. This framework is built upon four statements of contextualisation as presented by Gold & Gold (2011). These four statements are:

1. Legacy is the *raison d'être* for the Olympic Games yet still no city has undergone a full evaluation of legacy from an Olympic Games.
2. There is a tendency to accent the positive.
3. There is a changing balance of sports to non-sports legacy.
4. The question of inclusion and exclusion regarding the equity of legacy.

These statements will be expanded below, in addition to an explanation of how they address the research question.

*Legacy is the raison d'être for the Olympic Games yet still no city has undergone a full evaluation of legacy from an Olympic Games.*

Recent IOC development, namely the establishment of the Olympic Games Global Impact (OGGI) project encourages host cities to report on staging the Games after one and three years have elapsed. With limited cooperation from eligible cities, there still remains a dearth of official, host-driven post-Games analysis of legacy. Henceforth, each analysis will begin with an abridged compendium of the intended legacy of the relevant Olympic Games; this will address the first challenge of understanding the reality of legacy through the determination of its socioeconomic impact, and an appreciation of the historical context against which it transpired. With more than a decade since the most recent Olympics of study (Athens 2004), sufficient time has elapsed for a substantial evaluation of the legacy of the relevant Games.

*There is a tendency to accent the positive.*

The abridged title of this thesis is 'The Reality of Legacy' and with the Games comes hyperbole to no end, with politicians and organisers alike extolling the forthcoming socio-economic transformation that will be brought about by the Olympic Games. The rewards will last generations and future citizens "will be repaid handsomely for costs borne by current citizens" (Gold & Gold, 2008b). This disconnect from economic sensibility leads to an arguably deliberate blind-eye being turned to the potential misgivings associated with the Games: "poor stadia design, withdrawal of sponsors and heavy cost overruns" (Fussey, Coaffee, & Hobbs, 2016). Therefore, there must be an analysis past this tendency to accent the positive. In order to do this, a wide range of sources will be used when evaluating the legacy of the Games. A narrow focus on official documentation is likely to find itself mired in the partisanship-tinged bias behind such reports. Subsequently, national and international media coverage and impartial academic studies will be referenced alongside organising committee reports in order to provide a well-rounded impartial review of the legacy of the relevant Games which will hopefully sit closer to reality.



*There is a changing balance of sports to non-sports legacy.*

As an international celebration of sport, the Olympic Games bestows upon its host substantial sporting infrastructure - few and far between are the cities with the required level of facilities suited to the ever-increasing list of Olympic disciplines. Therefore, construction is a necessity. Even in the rare cases where a city is blessed with facilities, the global attention that comes with the Games often encourages expenditure on extravagant stadiums in addition to existing facilities. An additional aspect of sports legacy is the encouragement of increased sport participation by the general population. In London particularly, one of the central legacies of the Games was the enhancement of “sport in London and the United Kingdom forever” (London 2012, 2004). Headline ambitions of the sitting Labour government were to “inspire young people through sport” and to “get people more active: helping at least two million more people in England be more active by 2012”. Whilst the tangible goal of two million was dropped by the subsequent government under the premise of being “counterproductive”, the coalition government presented a legacy plan for “increasing grassroots sporting participation, particularly by young people, and to encourage the whole population to be more physically active” (Woodhouse, 2016, p. 5). With regards to the research questions within this thesis, an analysis of the success of this ambition is not the remit of this thesis; what is of importance is the expanded dimension of sporting legacy as part of the overarching concept of legacy. Furthermore, Section II of this thesis will quantitatively evaluate the expanded non-sporting legacy of the London 2012 Games. Therefore, in order to competently understand the reality of legacy, attention will be paid to this balance, its changing nature, and its actuality in London.

*The question of inclusion and exclusion regarding the equity of legacy.*

With the Olympics, the eyes of the world are drawn to the host city. Hence, the Games become a readily available stage upon which to parade the tensions and frictions of a tormented society (COJO, 1978). With this in mind, many hosts have utilised the event as a means of healing these tensions and promoting an agenda of social equity through sport. In order to assess the equity dimension of the legacy the key recipients of the legacy benefits will be noted as well as those that bear the associated costs. These costs and benefits rarely fall equally. In Atlanta, host of the 1996 Olympic Games, overbearing commercialization and targeted regeneration led to criticisms of inequity. The city’s business community stood to benefit from the influx of hotels, offices and new public plazas, whilst the downtown residents found themselves displaced by gentrification and redevelopment that arguably deliberately neglected them. Gold & Gold note four dimensions of equity; social, economic, environmental and spatial. The first refers to an egalitarian distribution of the rights and opportunities that arise as a result of legacy. The second, economic, refers to the equitable distribution of legacy induced wealth. The third focuses on the ‘greener’ side of the Games and the environmental legacy of the Games. The final refers to a spatial distribution of legacy outcomes regardless of location. Whilst these dimensions are not presented as achievable and realistic goals - the authors admit that they can in fact lead to tensions with each other – they are without a doubt integral to the achievement of a well-rounded legacy. Thus, an understanding of the reality of legacy must consider how the after-effects are distributed.

By utilising the above framework, a consistent, comprehensive evaluation is aspired towards. An attempt will be made to explore the above through the use of range of sources including but not limited to official Olympic reports, academic literature and media coverage. Each Olympiad has been distinct in its means of interpretation of the concept of legacy and therefore despite a more unanimous acceptance of the centrality of the concept, its implementation is as varied as the cities themselves.

## 2.5 Montreal 1976 - The 40-Year Hangover

### 2.5.1 The Legacy of the Montreal Olympic Games - A Historical Context

It is only fitting that an analysis of legacy as the *'raison d'être'* for the Games begins with 'Les XXles olympiques d'été', or the 'Games of the XXI Olympiad' as titled by the English-speaking world. As one of the most connotative words in Olympic history 'legacy' arguably came in to play with the Montreal 1976 Summer Olympics. Until that moment it had made one solitary appearance in Olympic reports before a then-striking four in the Montreal Olympic organising committee (Comité de contrôle des Jeux olympiques - COJO) documentation (The University of Greenwich, 2008). With this iteration of the Olympic Games, the resultant legacy encompassed a broad yet disparate range of socio-economic changes on a startlingly far-reaching level. The fires of local pride stoked by the Games fuelled the Quebecois separatist movement, leading to a failed referendum four years later. Local sporting heroes were found in worlds' fastest teenager Hank Palmer, who was inspired to sporting glory by the Olympic pendant given to him by his mother. Furthermore, the funding method utilised for the Games, the 'Mission Million Possible' lottery, popularised lotteries across Canada in addition to raising an indispensable \$15 million (Purdon & Palleja, 2016). Unfortunately for Montreal, the prevalent legacy of the 1976 Olympic Games is debt. So vast were the staggering financial failures, the payback period was termed "The 40 Year Hangover" (Todd J., 2016) and the centre piece stadium, an elliptical donut of a building is locally known as 'The Big Owe' a repurposing of the original 'The Big O' as befits its shape. Public opinion in the wake of the Games is mixed: "It took us 30 years to pay it off and as a taxpayer I'm not too happy about it" (Newton, 2012). Former Vice-President of the International Olympic Committee and Montreal resident Dick Pound stated "It was not very well managed as a financial project. And we have a fabulous stadium, but I think it cost more than all the covered stadia in North America put together, " (Newton, 2012). All in all, the prevailing legacy of the Games is not a positive one. As the Games left town, "Montreal woke up to what remains the worst hangover in Olympic history: not just a bill that came in at 13 times the original estimate, a string of officials convicted of breach of trust and the greatest white elephant of a stadium ever built, but a creeping sense of economic and social decline. Forty years on, no other Olympics has so thoroughly broken a city."

### 2.5.2 The Reality of the Montreal Olympic Legacy - The Tendency to Accent the Positive

The accentuation of the positive aspects of the legacy of the Games is most often performed by the optimistic organisers behind the Games. The man behind Montreal's disaster was none other than city mayor Jean Drapeau. Launching the organising period with a series of sanguine yet soon-regretted statements, Drapeau's first misstep was the proclamation of a financial guarantee: "The Games would cost a maximum of \$124 million and the history and reputation of Montreal would stand in the place of a guarantee (Auf der Maur, 1976)". Within two years,

Drapeau was forced to triple this cost projection. With a new price tag of \$310 million, more than one-third was set aside for the construction of the new stadium, a figure almost in excess of the original estimation for the total Games. Ever the optimist, Drapeau promised his citizens that the challenge of the Games would be “figuring out how to spend the surplus from the first self-financing Games in Olympic history” (Howell, 2009). To round off his trifecta of optimism, is the oft-quoted (and oft-derided (Patel, Bosela, & Delatte, 2013)) statement that “the Montreal Olympics can no more have a deficit than a man can have a baby” (Howell, 2009). In reality, the financial failings of the Montreal Olympic Games were so excessive that it has become a case study of project management failure (Patel, Bosela, & Delatte, 2013). Whilst man is yet to give birth, the deficit Drapeau was adamant would not come to pass, crippled his city for decades.

The impartial and uncontested reality of Montreal’s legacy was decades of repayments. It took the city until November 2006 (Purdon & Palleja, 2016) to complete repayments on an oft reported price tag of approximately \$1.4 billion. The stadium - an extravagant totalitarian creation - was the brainchild of French architect Roger Taillibert. Following a series of construction complications, poor project management and substantial cost overruns, within one year of construction starting, the COJO found themselves exploring alternative options such as building a cheaper stadium in the vicinity. Labour demonstrations, strikes and a bizarre insistence on the construction of a waterfall on top of the parking garages (to the tune of \$60 million) eventually concluded with the ejection of Drapeau and Taillibert. With problems piling up (COJO, 1978) the City of Montreal took the reins, also inheriting the expenses (Howell, 2009). The Olympics concluded with the most expensive stadium ever built in North America (Pound, 2010) and whilst the media may have regarded the city in quite a harsh light, much like Athens, the Games cannot be termed an abject failure. Drapeau’s pre-bid ambitions were for Montreal to be “establish[ed]...among the great cities of the world”. The reality of this legacy is questionable, and as with all Games, there has been a veritable abundance of research conducted in order to determine the socio-economic legacy of the Olympic Games. Canadian scholar Bruce Kidd “challenges the prevailing view of the Montreal Games as a complete financial debacle” (Kidd, 1992). In fact, he argues that, despite being remembered as an embarrassing failure, the Games are a reminder that “Olympic legacies may have long fuses (p. 151)”. Writing from the perspective of a historian and Olympic participant - Kidd himself was a member of the 1964 Canadian track and field delegation to Tokyo – he believes that the Games rekindled the spirit of a united country and kick-started a proud new age for Quebec sport. The increased social investment helped Quebec become one of the most progressive regions of Canadian sport and physical activity.

The concern with many assessments is that they are written by Canadian academics such as Kidd, wishing to present a more positive post-Games picture of the Montreal Olympics. Another such assessment is that of Dick Pound. Keen to substitute ‘fact for fiction and media exaggeration’ (Pound, 2010), Pound, most likely spurred by his own personal investment as a Montrealer and a COJO member alike, insists that Drapeau was a visionary who “rightly believed that we should play on the world stage”. In his post Games article, *‘Montreal: The Olympic Legacy’* it is postulated that Drapeau’s chief mistake was to not “separate Olympic-specific costs from basic infrastructure improvements”. These, Pound argues, were a necessity with or without the Olympics and therefore should not be attached so negatively to the \$1.3 billion ‘cost’ of the Olympics. Assessed from this perspective, the legacy of the Games is less black-or-white; the Games did indeed contribute to the global recognition (or notoriety) of Montreal. They contributed to a changed perception towards

sport and they equipped the city with the organisational capabilities to host a range of cosmopolitan-affirming events. Consequently, the source of contention is the colossal financial costs behind the stadium and the lengthy repayment period. Whilst Pound occupies the smaller subset of defensive Montrealers, despite this positive perspective of the Games legacy, most, it seems, are slightly prickly about the Games. Many are still incensed by the financial burden placed upon them and their city by Drapeau and his affiliates. Others are “weary... about Montreal being known for staging the Olympic Games that almost bankrupted the city (Newton, 2010)”.

### 2.5.3 The Balance of sport to non-sport legacy

The strongest indicator of the misbalance of sport to non-sport legacy of the Montreal Olympic Games is in the balance sheet. In Montreal there was an overall cost-overrun of 796% (Flyvbjerg & Stewart, 2012) and a sports-related overrun of 1266%, a total of 6.0 billion USD spending on sporting infrastructure, most of this on the Olympic stadium. This sports related expenditure was part of the intended ambitions of the COJO to inspire greater sporting participation amongst citizens of Montreal. Prior to the Games, the city lacked an Olympic-sized swimming pool and did not have a single 8-lane running track. With the departure of the Games, the city was left with 3 pools, 3 international level running tracks, 3 hockey stadiums and a hugely accessible aquatics basin in the centre of the city (Guay, 1996). This abundance of sporting facilities had a clear influence, as reflected in the improved sporting participation rates amongst citizens, with Montrealers more than doubling the performance of Torontonians (Robin, 1998). The Games arguably popularized the principles of sound physical health and inspired a generation of athletes through the simultaneous provision of world-class training facilities and personal stimulation resulting from civic pride (Robin, 1998). Indeed, as of 2012, ‘The Big O’ has finally earned its rights to stay. Manon Barbe, Montreal’s councillor for Sports and Leisure stated the following: “Now it is paid, and it’s profitable for Montreal to keep it,” As an indirect result of the Games and the sporting infrastructure it created, “Montreal has more than 1,000 elite athletes and more than 100 coaches”. According to Barbe, this is because “...we decided to keep most of our sporting facilities,”(Newton, 2012).

Further research postulates that the Games resulted in a range of socio-cultural legacies for Montreal. Guay (1996) in his legacy analysis argues that the Games “bring a broader exposure of the nation to the world community, internally it strengthen[s] the sense of community, heighten[s] civic spirit, invigorate[s] [the] national economy”. The hosting of the Games was, according to Guay, Montreal’s ‘passport’ to join the western world advanced society.

In this instance, there are many aspects of reality that fall in line with the legacy goals. The ‘one-two punch’ of the 1967 International and Universal Exposition and the Games of the XXI Olympiad, both orchestrated by Drapeau, afforded Montreal a ‘legacy of knowledge’, an organisational capacity which arguably led to the successful hosting and establishment of the Montreal International Marathon, the Formula 1 Grand Prix, the Montreal Jazz Festival and the Montreal Film Festival amongst others. As events, these cultural and sporting extravaganzas have contributed to the elevated national image of the city and therefore reflect the success of Drapeau’s ambition for his city to be “establish[ed]...among the great cities of the world”.

## 2.5.4 The Equity of the Montreal Olympic Legacy

As quoted earlier from the Montreal 1976 Official Report, the Games become a readily available stage upon which to parade the tensions and frictions of a tormented society (COJO, 1978). These frictions in the case of Montreal and Quebec were the general distrust between the Anglophone 'elite' and the wider Francophone population of the province. Referred to as the 'cultural wars' by Kidd, the growing federalist-separatist/English-French tensions were consuming the province and therefore the COJO promoted the noble goal of unity. The agenda was inclusiveness, and to promote this inclusiveness, firstly amongst the athletes themselves, Mission 76 was set up; a special programme aimed to maximise the number of Quebecois places on the Canadian delegation (Boileau, Landry, & Trempe, 1976). Secondary to this was the less centralised approach of directing resources towards mass participation and social equity (Kidd, 1992). Despite a 'lyrical evocation' of the social benefits of mass participation (p. 476), the social equity goals were largely forgotten for two reasons. One, Olympic funding, under Drapeau's directive, was channelled towards the construction of standout venues. And two, resources were mostly channelled into high-performance sports, rather than the lower-level mass participation sport.

In conclusion, whilst the city did receive a range of sporting facilities and the subsequent improved accessibility, as one of the most expensive Olympic Games to date, the fiscal implications of such spending lasted for decades. Taxpayers were heavily burdened for generations as the "40-year hangover" took hold.

## 2.6 Los Angeles 1984 – Selling the Five Rings

### 2.6.1 The Legacy of the Los Angeles Olympic Games – A Historical Context

Bring the Games to the entertainment capital of world and you're guaranteed a show. With "Hollywood-crafted" opening and closing ceremonies, the 'Games of the XXIII Olympiad Los Angeles 1984' are now regarded as the sparkling saviour of the Olympic Games (Llewellyn, Gleaves, & Wilson, 2015). As the capital of the "world's popular culture industry", the Los Angeles hosting of the Games "redesigned and revitalised the modern Olympic Movement and reenergised the Games at a crucial time". As the capital of the Golden Coast, Los Angeles enjoys an almost symbiotic relationship with Olympic Games yet despite its self-proclaimed status as the 'Olympic City', the Los Angeles relationship with the Olympic Games can hardly be described as easy. From 1939 onwards, the Southern California Committee for the Olympic Games (SCCOG) bid for each and every Olympic Games, losing for four straight decades, arguably allowing the city to perfect the art of bidding (Dyreson & Llewellyn, 2008). As the 1984 Games approached, the Olympics were in dire straits. Mired in political controversy; with a series of boycotts and fatal terrorist attacks, the financial disaster of the 1976 Montreal Games had "scared away every potential suitor (p. 2001)" leaving only Tehran and Los Angeles in the running. The descent in to the 1979 revolution forced the Iranian capital to drop out leaving Los Angeles as the winner by default (Reich, 1977).

With a clear road ahead, the Los Angeles Olympic Organising Committee (LAOOC) began the process of building the Games they had tirelessly fought to host. The LAOOC, much like Montreal, was built of entrepreneurs and 'financially savvy' business leaders (Walker, 2014). Dubbed the LA84, the committee was led by Peter Ueberroth, a "relatively unknown but successful business mogul (Llewellyn, Gleaves, & Wilson, 2015, p. 3) and it was mostly by his hand that the LA84 developed strategies that "limited costs and maximised revenue

(Kennedy, 1982)” These strategies were ultimately successful; the reality of the LA84 legacy was of profit - \$232.5 million of it. Ueberroth, aware of the withholding of public money (Ueberroth, Levin, & Quinn, 1985) had committed himself to delivering an event that could pay for itself (Wenn, 2015). This feat, of successfully accomplishing a financially successful Olympic Games, had occurred only once before in modern Olympic history: with the 1932 Los Angeles Olympic Games and it is likely that the decades of unsuccessful bids prepared LA to host the “most profitable and ... arguably the most important event in the history of the modern Olympic Movement (Llewellyn, Gleaves, & Wilson, 2015, p. 1)”.

### 2.6.2 The Reality of the Los Angeles Olympic Legacy – The Tendency to Accent the Positive

The glimmer of positivity shimmering around the Los Angeles Olympic Games was no mean feat. Carefully crafted for the TV, LA 1984 assisted the city in its rise to becoming the capital of the entertainment industry (Dyreson & Llewellyn, 2008). As established by Dyerson and Llewellyn, a deliberate attempt was made to manufacture an Olympic legacy for Los Angeles (p. 1992) and therefore “Los Angeles is *the* Olympic City,”. This is a sentiment with which most Angelinos agree’; termed the “Most Successful Games Ever” by LA writer Alissa Walker, LA hoped that the Games could “turn around its reputation as a smoggy, sprawling megalopolis lacking a center or any real civic pride” (Walker, 2014). This is echoed by the official report:

“But the success of the Olympic Games cannot be measured by the amount of surplus alone. The impact of the Games upon Los Angeles transcended the event. For two magical weeks, the city was united and enchanted. The eyes of the world focused on Los Angeles and saw not smog, not traffic jams, not crime, rather a city rejoicing. They saw a city that was warm, vibrant and friendly and they saw a transportation system that actually worked. The citizens of Los Angeles as well as all Americans discovered a new pride in themselves, their city and their country” (LAOOC, 1985, p. 25).

This surplus, mentioned within this quote, was the result of the financial stringency of the 1984 Games, partly stipulated by the lack of Government support (Walker, 2014). Borne of this financial handicap were the ‘Spartan’ Olympics. In reference to the budget-minded consensus with which they were staged, as opposed to the birthplace of the Games, the Spartan Olympics also garnered an alternate name; the “capitalist Olympics”. In order to overcome the financial limitations of the non-existent state funding, the LAOOC aggressively pursued sponsorship from large corporations, determined to raise as much money as possible whilst simultaneously minimizing costs (Nixon, 1988). Many expenditures were minimized through the restraint shown towards the construction of new venues and the pursuit of maximum TV revenue. Ueberroth, with a steady hand on the helm, established three ‘pillars’ of his effective game plan for a financially responsible Olympic Games.

The first ‘pillar’ of his game plan was the maximum usage of refurbished venues as opposed to the construction of new ones. LA already played host to a wealth of venues left over from its 1932 stint as the Olympic host, only three new venues were constructed, all of which were heavily sponsored (Wilson, 2015). Ultimately, the restraint shown by Ueberroth with respect to new facilities assisted in the minimisation of expenditure. In comparison to past Games, the LAOOC spent a meagre \$92.9 million compared to the \$1.7 billion spent by Moscow 4 years prior and the \$289 million spent by Seoul in 1988 (Wilson, 2015). This focus on “making these facilities Olympic-ready (p. 147)” as opposed to construction kept costs low;

the Los Angeles Memorial Coliseum, already used as the Olympic stadium of the 1932 games, was modernised to 1984 standards. Further savings were found through the use of student dormitories in the place of a newly constructed Athletes Village.

Ueberroth's second pillar was an obvious eventuality; the maximisation of TV revenue in the land of Hollywood. The accompaniment of a lucrative TV deal allowed the 1984 Games to become "truly ... a global television event (Walker, 2014)" marrying the Olympics with the modern entertainment industry (Dyreson & Llewellyn, 2008). Aided by LA's position as the sole bidder for the games Ueberroth successfully managed television negotiations in excess of \$280 million. The broadcast ran for 180 hours to the largest international audience in history presenting to billions around the world the perfectly crafted image of LA.

The third pillar, quite closely linked to the first, was the pursuit of substantial sponsorship deals through the "reconfiguration of the organising committee's corporate sponsor programme (Wenn, 2015, p. 158)". The sole new venues were the 7/11 Velodrome, the McDonalds sponsored Aquatics centre and the Fuji-funded shooting range. These naming rights supported the construction funding of the venues. In addition to this Ueberroth courted a limited number of sponsors, seeking maximum revenue from each "in exchange for product exclusivity".

In combination, these three pillars sufficiently supported Ueberroth's ambitions to create a highly regarded legacy. The 1984 Olympic Games "were the first Official Report in which it can be reasonably argued that there were more than incidental uses of the term" (Gold & Gold, 2008b). Whilst the respective committees of yesteryear had made considerations for the post-Games period, the LAOOC implemented the most substantial legacy of any Games before it, a legacy so strong that it can be surmised from two instances. Firstly, Ueberroth's machinations within Los Angeles were so highly regarded post-84 that he is the only person to earn Times' Person of the Year for work in sport; "The Achievement was Olympian" was the tagline emblazoned across his cover (Morrow, 1985). Secondly, and perhaps more tellingly, the Games left such a sweet aftertaste that the United States Olympic Committee (USOC) has crafted a bid proposal for Los Angeles' third hosting of the Games, aiming to join London as the only city to host the Games three times.

Despite the overwhelmingly positive consideration given to the LA 1984 Games, there are still points of contention. Scholars John Horne and Garry Whannel contest the existence of the surplus believing that the 'extensive hidden public support in the form of transport, infrastructure, policing and security' invalidate such a claim (Horne & Whannel, 2012). Such public spending was not included as part of the LAOOC budget and certain aspects of it, namely federal security spending, arguably would have occurred with or without the Olympics (Freund, 2013). Furthermore, the City council's increased hotel tax by 1.5% with 0.5% dedicated to offsetting any city expenses resulting from the Games. These, without a doubt, can be classified as public assistance for the Olympic Games, yet Wilson has a different opinion to the claims of Horne and Whannel. "There were no significant 'hidden' costs. The federal, state, county and municipal governments all openly reported on Olympic costs following the Games (Wilson, 2015, pg. 148)". Therefore, the reported surplus was 'strictly a reflection of the organising committee's operating budget'. Contention aside, it is an assured fact that the reality of the Los Angeles Olympic legacy was of surplus.

### 2.6.3 The Balance of sport to non-sport legacy

In Montreal, Drapeau confidently stated that the challenge of the Games would be “figuring out how to spend the surplus from the first self-financing Games in Olympic history (Howell, 2009)”. In Los Angeles, this became reality. Expenditure on new infrastructure was limited and therefore it is no surprise that ‘but a “few writers mention sports infrastructure as a 1984 legacy (Wilson, 2015, p. 145)”. This is affirmed by the table below showing the comparative construction costs amongst Olympic Games before and after the Los Angeles 1984 Games. At approximately \$93 million, spending on ‘hard legacy’ – the ‘local, tangible Olympic legacy’ (MacAloon J. , 2002) – was much lower than any recent Game before or after.

**Table 1:** Construction costs of select Olympics

City	Expenditure (in 1984 \$)
Moscow 1980	\$1 708 596 472
Los Angeles 1984	\$92 973 000
Seoul 1988	\$289 037 442
Barcelona 1992	\$358 455 155
Atlanta 1996	\$327 465 633

(Wilson, 2015)

Indeed, the real sports legacy of the LA Olympic Games was the creation of legacy from the surplus. The LA84 Foundation had a dual mission of “supporting youth sports in Southern California and educating the public about the role of sport in society (pg. 148)” through the use of grants and coaching programmes. Hence, the existence of such a substantial post-Games surplus allowed for the creation of legacy. Entitled to 40% of the \$232 million surplus (Walker, 2014), the LAOC Amateur Athletics Foundation (now the LA84 Foundation) made 257 sports infrastructure grants amounting to \$20.4 million between 1985 and 2013 (LA84 Archives, 2014). Nearly 100 sports facilities were refurbished or built in Southern California (Wilson, 2015). Stadiums were refurbished, community courts built and public-private partnerships were formed. Whilst in many cases these grants did not tip the scale in the favour of large projects being built, the grants allowed for the construction of bigger and better than would have come about through solely private funding. In some instances, the grants were the required political reinforcement, the ‘first-mover’ that went on to attract further private funding. The sporting legacy of the 1984 Games was therefore the paradox that by building ‘almost nothing’ the Games led to the building of many things.

### 2.6.4 The Equity of the Los Angeles Olympics

The reality of the Los Angeles Olympic Games legacy represented the first real divergence from the ‘idealistic vision of the IOC’ (Llewellyn, Gleaves, & Wilson, 2015). Since its conception, De Coubertin had spoken against “athletics as a show”, aware of the essentiality of commercial support but opposed to the temptations of corruption, which was, in his opinion, “the root of the evil”. The early Games, restricted by their pre-television scope, did not fully enable commercial exploitation of the likes seen today. The ‘84 Games have been described as the ‘watershed’ for the realisation of the commercial potential of sport and sporting events. In LA 1984 “everything was for sale” (Tomlinson, 2005) and with the combination of international broadcasting deals, the full torrent of commercialism was set loose on the Games. The LA Olympics saw the commodification of Olympic symbolism; the torch relay was costed at \$3000 per km to be donated to any charity, an initiative strongly



opposed by the Greek contingency. Still, it went ahead, with sponsorship provided by AT&T of course. The financial success of the 'LA model' led many others to follow in its path; ruthless commodification, abandonment of the ethos underpinning the Games and the recognition that the Games were commercially exploitable (Tomlinson, 2005). Whilst this commercial exploitation resulted in profits it also leads to questions of equity.

The beneficiaries of the Los Angeles legacy are reasonably broad. The LA84 foundation enhanced access to sporting facilities, impacting, by its own admission, over 3 million youths through 3000 grants and the training of 75,000 coaches at its education clinics (LA84 Foundation, 2016). Further beneficiaries of the infrastructure grants are public entities such as "the City of Los Angeles, County of Los Angeles and Los Angeles Unified School District,... the Boys and Girls Clubs, the YMCA" (Wilson, 2015, pg. 14). Approximately 4043 new jobs were created across the city (Baade & Matheson, 2002), and citizens also benefited from the improved image of their city.

In addition to this, taxpayers did not find themselves unnecessarily burdened financially like their Montreal counterparts. Whilst there were elements of public spending, the state also funded the majority of this through the aforementioned increase in hotel taxation, therefore limiting resident burden. In conclusion, the LA Olympic Games legacy was well distributed; the city image was vastly improved, sporting access was enhanced and various municipal bodies were bolstered through grants. The legacy of the Los Angeles Olympic Games was therefore both broad and equitable.

## 2.7 Barcelona 1992 – The Birth of the Golden Age of Sport

### 2.7.1 The Legacy of the Barcelona Olympic Games – A Historical Context

Whilst the Los Angeles 1984 Games are held up as the financial example of how to host the Olympics, the Games of the XXV Olympiad in Barcelona are often regarded as the exemplar of event-driven urban regeneration. Whilst LA had substantially improved certain aspects of the credibility of the Olympics as a beneficial event to host, it took the later Barcelona Games to restore the Summer Olympics to its position as "the acme of desire for place promoters and urban regenerators (Gold & Gold, 2008b)". Since these Games, the city has been an "inspirational model for other Olympic hosts...the standard on how to use the Olympic Games as a stimulator for urban development" (Kassens-Noor, 2012). The Barcelona Model, as it is thus called (Capel, 2005), is the implementation of "strong and long-term strategic visioning, excellence in urban design, and the importance of well-funded social programmes" (Coaffee J. , 2011) and refers to the accelerating effect the Games had on developments which would have otherwise taken decades to come to pass (Mosby, 1992).

The urban regeneration of 1980s Barcelona was much needed. Now regarded as one of the most beautiful and well-visited cities in the world – an "enchanted seaside city with boundless culture, famed architecture and a world-class drinking and dining scene. (Lonely Planet, 2014)", the consensus is that it is beautiful and the numbers do not lie. Barcelona is the fourth most visited European city after sojourning staples London, Paris and Rome. In 2012, 7.44 million tourists visited the city's hotels according to a tourism board study (CNA, 2013). So popular is the city, its mayor, Ms. Ada Colau has called for a moratorium on hotel construction wanting to avoid "end[ing] up like Venice (Leadbeater, 2015)".

Now compare this to the pre-Olympiad Barcelona. During the Spanish Civil War of 1936-39, the Catalan region had been a resisting force and with General Franco's nationalist victory, its capital was deliberately neglected, slowing becoming an industrial

backwater of Spain (Taylor, 2012). As such, the successful Olympic bid by the Organizing Committee (COOB'92) afforded the city an opportunity to counter this neglect (Gold & Gold, 2008a).

### 2.7.2 The Reality of the Barcelona Olympic Legacy – The Tendency to Accent the Positive

The COOB'92 was a not-for-profit consortium of public and private bodies under the jurisdiction of the Olympic Charter. It was made up of the Barcelona City Council, the Generalitat of Catalonia, the Spanish Government and the Spanish Olympic Committee (International Olympic Committee, 1989). In order to improve efficiency it operated as a limited company with the following objectives (only those of relevance are quoted) (Truñó, 2002):

- to use the Olympic Games as a catalyst for developing of the city;
- to not only prepare the city for the Games held over 15 days, but to work for the future, the day after the Olympic Games;
- to open up the city to the sea.

Driven by these three priority objectives, 83% of the total Olympic expenditure was directed towards urban improvement (Varley, 1992) which was not directly necessary for the holding of the Games.

Gold & Gold (2008) recognise the position of the Olympics as a mega-event and thus explore the increased scale of ambitions with respect to urban regeneration and city branding. The scale of urban transformation in Barcelona was substantial; The metro system was expanded, as was the international airport. The newly constructed Olympic village became residential, hotel and business accommodation with 4500 new flats and the telecommunications network was modernised. 5000 new hotel rooms were built and coastal access was enhanced (Coaffee J. , 2007) through the construction of a 30-mile road linking the Olympic sites (Evening Standard, 2011) (Kassens-Noor, 2012).

As Franco had ignored Barcelona, so certain neighbourhoods had been neglected. To counter this, four sports clusters were built, linked by the aforementioned link road. The vast majority of Barcelona Olympic venues were built in Montjuic, southwest of the centre. On the opposing side of the centre was the Villa Olimpica where billions were invested into leisure facilities in anticipation of the vast crowds that would fill the area. The COOB'92 acted as the principle investor, encouraging private funds to follow to much success.

Reception to, and therefore the reality of, the Barcelona Olympic legacy is overwhelmingly positive. Quoting Barcelona's 2012 mayor, the Olympic website describes the city as "totally transformed" (Trias, 2012) and the Games is now cited as the catalyst behind Barcelona's ascension into the top tiers of European tourist destinations. Overnight stays within the city more than doubled between 1990 and 2002. As a business location, it rocketed from the 11<sup>th</sup> ranked location in Europe, to the 6<sup>th</sup>, trailing only London, Paris, Berlin, Frankfurt and Amsterdam (Truñó, 2002). As a city brand, it is ranked 7<sup>th</sup>; a result of the highly effective parallel re-imaging strategy which began with the Games (Hospers, 2009). The Games kick-started a procedure monumentalisation throughout the city with the construction of new 'imageable' buildings (Balibrea, 2001).

The Olympics Games effectively acted as the impetus needed to renew the city. With the fixed deadline of the approaching Games, there was a sense of urgency which assisted with the successful execution of a broad range of projects within a short space of time. One of these central legacy goals of the COOB'92 was "to open the city up to the sea". Indeed, the

reconnection of the city with its coastline was a success. Prior to the Games, Parc de Mar (now Villa Olimpica) was an industrial area effectively separated from the city by a railway line. The Olympics driven regeneration opened up the area to the Barcelona inhabitants, providing them easy access to a 5.2km coastline (University of Lugano, 2005).

Barcelona is also referred to as the standout exemplar of the range of additional non-sports legacy functions which are now commonplace in Olympic legacy plans; the promotion of cultural tourism, the encouragement of inward investment and place promotion. With the Games, Barcelona 'found its place on the world map (Truño, 2002, p. 257)', it became a major tourist and conference destination and most important it set an example of how the private and public sector can work together.

### 2.7.3 The Balance of sport to non-sport legacy

Aside from the physical transformation of the urban landscape, the COOB'92, like many organising committees before it had ambitions to increase sports participation amongst its citizens. Aforementioned city mayor Trias was quoted extolling his city's attention to sport, "We have been very committed to sport for a long, long time now," said Trias. "It all started with the 1992 Olympic Games". Enric Truño, himself a member of the COOB'92 Permanent Commission and Sports Councilor for the Barcelona Town Council, titled his paper "Barcelona: City of sport" in light of what he saw to be a "new attitude on the part of the city's inhabitants towards active sporting activity (Truño, 1995)". The 92 Games created a set of large-scale urban transformation projects, enabling the great leap forward previously prohibited by the Francoist dictatorship. This new attitude to sporting activity is reflected in a heavily critiqued survey by the Barcelona town council reported on by the Centre d'Estudis Olímpics. Here it is claimed that the proportion of the population participating in physical/sporting activity at least once per week increased from 36% to 46% and then 51% in 1983, 1989 and 1995 respectively. Furthermore, the new sports centres, created as a result of the Games, registered membership increases of 46,000 new users. Whilst membership does not directly reflect use, it does in a way indicate an improved attitude towards sport participation.

The improved participation was spurred by the enhancement of (and improved accessibility of) the sporting facilities within the city. Through deliberation between the Barcelona Town Council and the COOB'92, a balance was found between locating facilities in locations suited to the highly stringent needs of the Olympics and also locations allowing for successful post-Games use. Many innovative strategies resulted from this criterion. Many municipal facilities became both infrastructure assets as well as sporting venues; an example is the Estació del Nord railway station, until that point abandoned, which then was restored whilst also accommodating the Olympic table tennis competitions.

The sporting legacy of the Barcelona Games can be surmised in what the Spanish media refers to as the 'Golden Age of Sport' (Usborne, 2008). In 2010, the Spanish had "the World Cup, Wimbledon and the Tour de France under Spanish control (Brown, 2010). Rafael Nadal became men's tennis No 1, Carlos Sastre won the Tour de France and the national football team won the European Championship. Further success was seen with Fernando Alonso's 2<sup>nd</sup> place position in the 2010 Formula One season. These successes are traced back by many to the Barcelona Games 92 for its inspiration of winners and upgraded sport facilities left in its wake. Quoting Mayor Trias for the last time: "We've really thrown our weight behind increasing participation in sport for everyone, especially those who are suffering physical or economic difficulties, and that is where we will continue to invest in sport. In Barcelona,

holding major sports competitions is now a key part of our development and I'm convinced that sport is the perfect way to inject life into a city, to improve its well-being and to put it on the international stage (Trias, 2012)".

#### 2.7.4 The Equity of the Barcelona Olympics

The Barcelona Olympic Games had a substantive transformative effect on the urban landscape of the city. The claimed legacy of sport is claimed to have brought sports which were "traditionally the preserve of a minority" within access of the general population (Truñó, 1995). Examples are the Municipal Sailing Centre, constructed right next to the metro. Its construction allowed for 16,000 people to partake in yachting, water-skiing, canoeing and more in the three years since the Games. Other public facilities include the Foixarda Municipal Riding School and the Picornell Swimming Pool. The cityscape was enhanced through 50km of bicycle paths and 700 of the city's now 3000 sports venues are public property. The Olympics therefore brought sport and physical activity within a closer reach of its residents, regardless of limitation.

Despite these benefits, there are accusations of social cleansing as a result of the regeneration of neighbourhoods. A COHRE study found that there were 2500 evictions, housing price increases of 139% and rental price increases of 145% in the period 1986 to 1993. Availability of public housing fell by 76%. Particularly concern was raised surrounding the displacement of over 90% of the Roma population of certain areas surrounding the Olympic village (Diamond-Welch, 2012). The locals have not been oblivious, daubing anti-gentrification graffiti across the warehouse conversions (Evening Standard, 2011).

In conclusion, the Barcelona Olympic legacy of sport is extensive; the improved accessibility to sporting facilities has benefitted large swathes of the population and inspired a generation of sport. On the other hand, whilst the city unequivocally benefited from the beautification and widespread regeneration, for some residents this came with displacement and controversial gentrification and therefore the inclusivity of the urban legacy of the Barcelona Olympic Games is more contentious.

### 2.8 Atlanta 1996 – "Taste The Feeling"

#### 2.8.1 The Legacy of the Atlanta Olympic Games – A Historical Context

1996. A full century of the modern Olympic Games. The Centennial Olympic Games – The Games of the XXVI Olympics were termed 'The Celebration of the Century'. Held in the Georgian capital, Atlanta, the 1996 Summer Games were the USA's fifth Olympic hosting. Post-Games analysis has been framed by two events which have come to define the Atlanta 1996 Games. The first was the tragedy of the Olympic Centennial Park bombing. With two fatalities and 111 injured this politically motivated attack soured what had until that point been a jubilant celebration of sport. The second was the overt commercialisation of the Games, itself the outcome of a state imposed mandate to run the Games without the use of taxpayers' money. The 1996 Games were therefore financed through heavy commercialisation in the form of sponsorship deals, fronted primarily by corporate Atlanta-natives Coca-Cola.

The bidding process was a challenging one marred with controversy. Atlanta was at a disadvantage with its bid following closely after the US's successful hosting of the 1984 Los Angeles Olympics. Furthermore, Greece, bidding for the right to host the centennial Games

in their 'rightful ancestral homes', presented a strong bid with Athens. Public support was not as forthcoming as expected; only after a "no new taxes" pledge by the Olympics organisers did political leaders and local businesses rally behind the Games. This pledge was the result of the restrictive state constitution which limited the role the city could play in financing the Games. This restriction led to the formation of the Atlanta Committee for the Olympic Games (ACOG) with the directive to operate as a private consortium. A 31-member governing board, the ACOG was made up of delegates from the United States Olympic Committee (USOC), the International Olympics Committee (IOC), and civic and business elites of the city including Atlanta Mayor, Maynard Jackson. Co-chaired by Andrew Young and Robert Holder Jr. the ACOG, much like the LA84 before it, generated large portions of its revenue through TV broadcasting rights, sponsorship deals, ticket sales and merchandising amongst others. Alongside the ACOG was the Metropolitan Atlanta Olympic Games Authority (MAOGA), acting as a financial overseer of the ACOG. Finally, the City of Atlanta adopted responsibility for the required infrastructure repairs throughout the city.

### 2.8.2 The Reality of the Atlanta Olympic Legacy – The Tendency to Accent the Positive

The organisation and directive of the 1996 Games was therefore shared between the ACOG, the MAOGA and the Corporation for Olympic Development in Atlanta (CODA) and a primary complication of the operation of this tripartite consortium, as with any collaborative governance strategy was the conflicting preferences, goals and strategies (Eshuis, Braun, & Klijn, 2013). The fragmentation limited coordination and also, as a result of the financial structure, the focus given to the priorities of the public sector. As the political face of the public sector within the ACOG, Mayor Jackson desired a legacy of "staging the best Olympic Games ever" and secondly "[to] uplift the people of Atlanta and fight poverty in the process" (Roughton Jr, 1991). Jackson's history was that of a unifying figure in the post-civil-rights political landscape of the city and therefore his ambitions to tackle the "twin peaks of Atlanta's Mount Olympus" were substantially more equity-driven than the commercially oriented goals of the ACOG. His goals were for redevelopment and through the Corporation for Olympic Development in Atlanta (CODA), a plan was developed for a "physical legacy of urban design improvements that would permanently improve the downtown" (French & Disher, 1997).

By comparison, the legacy goals of the ACOG were centred around business development (Andranovich, Burbank, & Heying, 2001) and financial profit. Spurred by the impressive financial track record of the 1984 Games in LA and the constrictions imposed by the Georgia constitution, the ACOG pushed an aggressive agenda of financial conservatism; the Games were therefore a vehicle for attracting support from Atlanta's business and political leaders (Andranovich, Burbank, & Heying, 2001), the end goal being the promotion of city's image as a tourist and conference city. A reflection of this ACOG directive was the construction of the Centennial Olympic Park; of little importance to the actual sport proceedings of the Olympics, the park was strategically located for tourism and the convention business expected in the wake of the Games, therefore exemplifying the direction of the ACOG vision throughout.

The reality of legacy within Atlanta is regarded as mixed. An Independent article on post-Games legacies describes Atlanta's as a "Legacy of opportunity" (Usborne, 2008). In a One Year Retrospective, French and Disher (1997) analyse the legacy of the Games in the Journal of the American Planning Association. Their assessment is broad; they find a

substantial legacy of world class sporting facilities, which, unlike Montreal found use following the Games. Whilst many existing facilities were utilised, an 83,100-seat Olympic stadium was built which was donated to the stadium following the closure of the Games. Another new feature was the Georgia Tech Aquatic Center, now used for student recreation and collegiate swim meets. The wealth of new construction enhanced an already “considerable inventory of sports facilities (p. 383)”. Much like Los Angeles before it, the Olympic Village was constructed in partnership with the education sector; the Georgia Tech campus expanding by 2442 rooms to the tune of \$241 million. Only \$47 million was provided by the ACOG, the rest financed by the University System of Georgia. This expansion assisted with the city goal of repopulating the downtown (Hill A. , 1994).

Mayor Jackson’s Olympic legacy goals were, through the CODA, to ensure an equitable distribution of the benefits of the Olympic Games and to “create a physical legacy of urban design improvements that would permanently improve the downtown (p. 385)”. After a detailed survey of housing conditions and household incomes (CODA, 1993), redevelopment plans were prepared and distributed. Unfortunately, the reality of legacy was limited by financial constraints. With little private funding available, implementation was stunted and the reality of any benefits to the inner city neighbourhoods was small.

Atlanta set itself commendable goals for the post Games legacy: the city aimed to “host the greatest peacetime event in the 20<sup>th</sup> Century” (Usborne, 2008)”, rejuvenate the urban landscape and create 77,026 jobs whilst boosting the state economy by \$5.14 billion in just the five years preceding the Games (French & Disher, 1997). French and Disher’s retrospective analysis reveals that they did seemingly perform the ‘impossible’, creating three of the four types of benefits believed to come from such a mega-event; The Games were financially sustainable and provided a short-term economic stimulus, there was a legacy of sport facilities and also a (spatially limited) transformation of the urban landscape. The shortfall regards the intended development of low-income areas. Still, the ACOG goal of place marketing was partially achieved. “The area surrounding the park has added major hotels, condominiums, new office structures” (Lohr, 2011). These investments, it is believed, would have still occurred without the Olympics but were accelerated with Atlanta’s hosting of the Games.

### 2.8.3 The Balance of sport to non-sport legacy

The sporting legacy of the Atlanta Olympic Games bears some similarities with that of Los Angeles. Already awash with a number of high-quality venues, the ACOG focused on enhancing community access to sport facilities and ensuring post-Games use of those that were built. Local media upholds this “lack of white elephants (Swenson, 2016)” as a source of local pride for citizens and city planners alike. Turner Field, built with \$200 million of private money is Atlanta’s former Olympic Stadium and now hosts baseball (Nickisch, 2015). The Aquatics Center, as mentioned earlier, is now in the ownership of Georgia Tech and the Lake Lanier Olympic Park has maintained its legacy as an active rowing site (Swenson, 2016). Clayton County International Park played host to the beach volleyball tournaments and Lake Lanier Olympic Park continues to host “world-class canoeing, kayaking, rowing and dragon-boat racing”, 20 years since it did so for the Games (Kirkpatrick, 2016). Unused venues are the tennis centre in Stone Mountain where “scraggly weeds grow thigh-high on the abandoned court (Arsenault, 2014)” and the Herndon Stadium, previously used for Olympic field hockey. This relative lack of white elephants is the result of a direct strategy to avoid the

failings of prior Games. “In every city you went - Montreal, Seoul – there was a big empty stadium sitting there. We built things for their afterlives, and then retrofit them for the Games”. Those are the words of Dick Yarbrough, managing director for the 1996 Games, and it was this directive that allowed Atlanta to mostly avoid the pitfalls of its predecessors.

#### 2.8.4 The Equity of the Atlanta Olympic Games

Despite the benefits of the Games, in direct contrast with Mayor Jackson’s desires, there were criticisms of substantial inequity in the outcome of the Games. The predominant beneficiaries of the Games were the city’s business community; the Games effectively marketed what was previously a city of little international standing (Kirkpatrick, 2016). Atlanta. Kirkpatrick makes reference to the intangible aspects of the Olympic legacy, the ability to “pull in the same direction in order to achieve this goal”. This, it is believed, was carried forward into global commerce and relocation of corporations to the Atlanta metropolitan region, thereby creating billions of economic impact according to Metro Atlanta Chamber President Hala Modellmog. The city is now home to 25 Fortune 1000 headquarters including home-grown corporations Coca-Cola and Home Depot. President and CEO of the Atlanta Convention and Visitors Bureau William Pate believes that the Games “gave Atlanta incredible visibility across the country and the world”.

“We as a community – a united community – we proposed what was honestly a preposterous, impossible idea. And yet, with the incredible energy and talent of this community and the sincerity with which they went about the effort, we pulled off the impossible. And that’s a great legacy because it says to me that we have that capability. It tells us that we should unite and coalesce around really big ideas for the community, because now we know that we can make them happen.” – Pate, 2016.

Despite this talk of “big ideas for the community”, the benefits of the Atlanta Olympic legacy were narrower than believed in their outpouring. The tripartite leadership ‘pulled in opposite directions’, limiting the scope of ambition, particularly financially. Downtown residents, anticipating improved job prospects and improved housing were left disappointed (Maloney, 1996) as with approximately \$100 million allocated to neighbourhood redevelopment, only areas in direct proximity to the Games were revitalised whilst those less seen were not. These controversially overlooked areas, sat just out of sight of the main Olympic thoroughfares and therefore found themselves neglected. Director of the Metro Atlanta Task Anita Beaty, quoted in the Boston Globe (2014), is heavily critical of what she calls the ‘steamrolling over Atlanta’. The Olympic building boom “decimated its public housing stock...and priced many low-income people out of their neighborhoods”. Hence, the legacy of the Atlanta Games can be described as a ‘legacy of ill will’ (Andranovich, Burbank, & Heying, 2001). Gentrification masqueraded as beautification as some residents found themselves displaced for an urban revitalisation that failed to incorporate them.

Lastly, whilst the ACOG ambition of financial sustainability led to ‘no crippling debt for the Georgians’ (Usborne, 2008), the required commercialisation of the Games led to the leasing of “public areas to small vendors and ... advertising” (Andranovich, Burbank, & Heying, 2001). Compared to a “cheap carnival” (Newman, 1999) the Atlanta Games stirred up such a strong anti-commercialist sentiment amongst the IOC that the organization dictated that it will “never again approve a privately financed Olympiad without at least a government

guarantee of the financing, the insistence on public money reducing the need for such flagrant selling of sponsorships (Applebome, 1996)”.

In conclusion, much like Barcelona, the Games enhanced the city image to the benefit of the business and tourism communities. Many residents also stood to benefit from the improved sporting facilities and redevelopment of the downtown area. Others though, found their neighbourhoods neglected, gentrified or even worse, demolished. The legacy of the Atlanta Olympic Legacy was therefore far from what was intended; a fractured leadership in the end resulted in a fractured outcome.

## 2.9 Athens 2004 – “A Homecoming”

### 2.9.1 The Legacy of the Athens Olympic Games – A Historical Context

September 5<sup>th</sup> 1997 was a day of jubilation; The Olympics were coming home. On this day, Athens defeated its rivals, Rome, Stockholm, Cape Town and Buenos Aires. It was the city’s second bid in recent years; a self-assured bid for the centennial 1996 Games had put forward Greece’s ‘entitlement’ to host the Games as the ancestral home of the ancient Games and its modern revival in 1896 (Longman, 1997). By contrast, the 2004 bid balanced humility with practicality. “We saw, back in 1990, that our desire and heritage alone would not guarantee our election to host the Games”. These words, from Gianna Angeloupoulos, the architect behind Greece’s successful bid, reflect the new attitude with which the country submitted its second bid. Greece wanted to *earn* the Games, boldly setting out its flaws and exactly how they would be addressed.

Athens, and Greece itself, were amongst the smallest host city/nation of the Olympic Games since Finland in 1954. With an Olympic year population of approximately 11 million, Greece was the veritable little guy stepping up to the same weights as its peers, smaller as a nation than the cities of Seoul (26 million) and Moscow (12 million). Yet, as the historical home of the Olympics and also the city in which the modern incarnation was revived, the challenge of the ‘homecoming’ was accepted with positivity and optimism – it was both a return to birthplace and a bridging of history.

### 2.9.2 The Reality of the Athens Olympic Legacy – The Tendency to Accent the Positive

The Games were seen as a “catalyst promoting the modern sport and culture in Greece” and intentions were for the exploitation of the legacy to be carefully planned and incorporated into the long-term strategy (Kasimati, 2015). The plans were to leave a legacy of pride among the Greeks and an actual legacy of public work, enhanced infrastructure and a dramatically improved lifestyle for the city of Athens and the whole country. (ATHOC, 2005). As such, the Games would accelerate the city’s modernisation and also lead to the acquisition of world class sports facilities. Further ambitions were to evolve the Athens tourist industry from its pre-Games seasonal form in to a year-long business through the establishment of a Tourism Development Agency. With newly improved infrastructure and upgraded hotel capacity, this was one of the welcome successes of the Athens 2004 legacy. 2005 saw tourism growth with a new high in hotel bookings reached in 2007 (Athens Tourism and Economic Development Company, 2008). In addition to the tourist goals, the Athens Organizing Committee (ATHOC) also had ‘green’ goals of improving environmental standers within Athens and improving air quality through the planting of trees and shrubs.



Greece faced many challenges as the Olympic host. As mentioned earlier, it was one of the smallest hosts of the Olympics in recent memory, inexperienced at hosting large-scale sporting events even half the size of the Games. The 2004 Games were the first post-9/11 Olympics and therefore came with substantially underestimated security costs which ultimately topped \$1.6 billion, four times the initial budget (Matheson, 2013). Lastly, this was with the inaugural imposition of strict EU regulations to their full extent (IOBE, 2015). Subject to the same if not more stringent specifications than its predecessors, the challenge was ever apparent.

Assessment of the reality of legacy presents a broadly disparate view. As mentioned earlier, the two-part ambitions were to accelerate the city's modernisation and also to acquire world class sports facilities; at the surface level, both ambitions were realised. In order to modernise Athens, the ATHOC unleashed a bevy of investment projects; a new tramway and suburban railway were constructed, the metro expanded and 90km of roads built, and a further 120km widened (Cartalis, 2003). A new Athens International Airport was built, replacing the over-capacity Athens Ellinikon International Airport. Beautification was also on the cards with the proposal of a widespread renovation of the historic centre led by the unification of archaeological sites. Some of these were old plans; the Games purely serving to accelerate them, whilst others were brand new, drawn up solely for the Games. Whatever the distinction, all of them were ambitious.

The second ambition, of facilities acquisition, was successful but only in the short run. 29 sports projects were promoted across the region and official Olympic legacy plans declared that 95% of all Olympic projects had post-Olympic use (Cartalis, 2003). With the establishment of the 'Olympic Properties S.A' with a directive to manage the venue post Games, it was expected that a positive legacy for Greece was guaranteed.

Yet, in direct contradiction of this, Baade and Matheson (2016), state that "many of the venues from the Athens Games in 2004 have fallen into disrepair". Indeed, a Telegraph article stated that "of the 22 venues . . . 21 are in a state of disrepair and under guard to prevent vandalism (Moore M. , 2008)". The old adage is that 'pictures tell a thousand words' and a Guardian photo spread shows the true fate of the 2004 venues. The benches that seated thousands at the rowing and canoeing Schinias Centre now buckle and rust in the sun. Weeds grow in the sand of the abandoned beach volleyball venue, the Aquatic Centre pool is barren of both life and water and the Olympic Hockey stadium is now a paint-peeling edifice to the concept of white elephants (Bloor, 2014).

This failure to ensure successful post-Games use is a result of a numerous factors. Presenting a comparison of the Olympic legacies of Barcelona 1992 and Athens, Nunan and O'Brien (2004) note the "better organization and cooperation" seen in Barcelona, primarily the integration with the Barcelona 2000 Strategic plan. Here, Athens struggled; political disputes hindered the implementation of plans, causing delays, sackings and even a threat from IOC president to take the Games away from Athens. A solid masterplan developed by Gianna Angelopoulos-Daskalaki and the Athens Olympic Bid Committee (ABOC) enabled Greece to win the Games, yet once the Games were won, Angelopoulos-Daskalaki and the ABOC were replaced and precious time was wasted altering and reviewing the masterplan (Gold M. M., 2011). Eventually, Miss Angelopoulos was reinstated, but also required to execute an alternative plan to what she had originally created (Gold, 2011, p. 322). This alternative plan distributed the Olympic venues across the city in order to avoid zoning legislation and as a result disallowing the same type of concentrated and focused regeneration seen in Barcelona.

A positive aspect of the Athens Olympic legacy is apparent when examining the lexical background of the word 'legacy'. The counterpart to this term in the Olympic Movement's second language of French is 'héritage' which "encompasses more of bringing the past into the present than 'legacy' does (Nunan & O'Brien, 2004, p. 22)". With greater emphasis on accumulated history, Greece's rich Olympic past was supported by the ATHOC's philosophy of 'bringing the Games back to its roots'. Hence, whilst "leaving a legacy for the future was very important to the Athenians, they placed more emphasis on the past and showing the pride of the Greek people for being the originators of an event such as the Olympics (p. 22)"

In conclusion, though the Greek bid was pragmatic a post-Games analysis of the Athens 2004 Games could not be faulted for surmising that the ATHOC did not plan for after the Games. "When a city gets the Games, it should make a business plan for big changes and then decide what the country needs for the day after the Olympics. This did not happen". These words, uttered by New Democracy politician Fani Palli-Petralia, present a disheartening view of the reality of the planning process and subsequent legacy of the Athens 2004 Games. Whilst born of ambition, the legacy failed to take off.

### 2.9.3 The Balance of sport to non-sport legacy

The Athens Olympic Games provided the city with a substantial number of upgraded and newly constructed sporting facilities, "though their subsequent utilisation is questionable (Gold M. M., 2011)". This utilisation has limited the scope of sporting legacy left by the Athens Olympics. The majority of the new venues were located north of the city centre in the Olympic Athletic Centre of Athens and as the home of the Olympic Stadium and Velodrome, the complex has found post-Games use as a sports and concerts venue. Other venues were much less fortunate. "Apart from the major transportation projects that have transformed the city, the purely Olympic projects were left in limbo like the fossils of white elephants, the decaying abandoned reminders of a collective dream that we could not translate into reality. (Kathimerini, 2008)". These 'purely Olympic projects', were intended for public recreation and leisure post-Games, (Tzouostas, 2008) yet found themselves abandoned. This poor utilization limited the sport-legacy of the Athens Olympic Games in a way unseen with the aforementioned Olympic Games. Whilst past Games from Montreal through to Barcelona improved the accessibility to the sporting facilities built for the Olympics, the ATHOC allowed them to fall in to disrepair. Regarding sports participation, numbers are disheartening; "What is evident from the statistics is that the Games in Greece had at best only a temporary impact on participation in sport and physical activity (Pappous, 2011)". Indeed, with new facilities being few and far between, a rebound effect occurred in which participation numbers actually dropped to levels lower than pre-Olympics. In conclusion, the balance of sports-legacy to non-sports legacy with Athens 2004 was substantially imbalanced. The post-Olympics realisation of aspirations was disparate; the city's image as a modern metropolis was improved (Kissoudi, 2010) yet the sports facilities left behind are unused and physical activity amongst Greeks enjoyed a short-lived increase before falling further than before.

### 2.9.4 The Equity of the Athens Olympic Games

As repeated throughout this section, the Athens Olympics acted as the catalyst for a widespread programme of urban regeneration. Hence, many city residents benefited from a legacy of enhanced infrastructure. Degraded areas such as the Faliro Zone were regenerated

(Boukas, Ziakas, & Boustras, 2012), and the city was beautified through the upgrading of urban space and the renovation of building facades. Prior to the Games, the city suffered from numerous urban problems: unplanned residential areas on the outskirts, obsolete infrastructure, traffic congestion and environmental pollution resulting from rapid and unregulated growth in the 1950s, 1960s and 1970s, when extensive internal immigration to the city took place (Kissoudi, 2010, p. 2781). Athens' five million citizens were poor users of public transport and there the Games-drive expansion of the road network and the new underground railway "improved the quality of city life by affording Athenians the possibility of travelling faster and reducing traffic congestion and air pollution".

Whilst the city of Athens was beautified extensively, it came at a cost. Just six years after spending \$11 billion dollars, the Greek government found itself requesting a €45bn bailout package from the EU and IMF in order to avoid impending bankruptcy (Pappous, 2011). The resulting austerity measures have led to poverty, social exclusion and a growing welfare crisis which has had profound effects across the entire population of Greece. Capital controls limited residents access to their own finances and restricted international bank transfers.

The Olympics represented a great deal of extravagance for what was such a small country (Smith, 2012) and as the country struggles through bankruptcy the positive legacy of the Games seems to be limited to Athens alone. For the rest of the country, the Games were the straw that broke the camels back. "It would have been better had they never taken place" (Smith, 2012) is the opinion of one Greek resident, an opinion sure to be shared across a nation in economic freefall.

## 2.10 Conclusion

### 2.10.1 Concluding Remarks

Section I of this thesis has presented an exposition of the evolution of legacy as one of the central tenants of the Olympic Games, from bid to execution to outcome. The research question under consideration is how, *as a conceptually broad, yet central tenant of the Olympics has legacy been exhibited in past Olympic Games?* From its historical home in Olympia to its globally transient modern incarnation, legacy has evolved throughout from its lingual origins in Montreal. With an ever-escalating price tag which topped out at approximately \$6.0 billion USD in 2015 terms the 40-year payback period tarnished the golden reputation of the Olympics as the bearer of renewed urban fortunes, a tarring which took the phenomenal financial success of the Los Angeles 1984 Games to repair. A 'made-for-TV' affair, the business-minded leadership of LAOOC chairman Peter Ueberroth led to the Games' second ever surplus of \$232 million. Whilst there were contentions regarding the rampant commercialism and commodification involved, the legacy of LA84 is apparent to this day; by building almost nothing, out of its surplus, LA built a new city image its and enhanced sporting access for millions. The Olympics as a machine for urban transformation truly hit a high gear with the Barcelona Olympics in 1992. Shying away from the frugal approach of LA, the COOB'92 directed 83% of the Olympic expenditure in to a long-overdue urban renewal of the cityscape. The balance of sport to non-sport legacy finds itself at its most extreme, yet the Barcelona 1992 Games are still considered the catalyst behind Spain's triumphant Golden Age of Sport. With the Atlanta Games of 1996, the ambition was for the best of both worlds; the financial diligence of its American predecessor, and the urban enrichment of Barcelona. With a fractured directorship, the reality of legacy was mixed with financial constraints

limiting the more socially equitable intentions. The outcome of financial sustainability required excessive commercialisation to the extent that the IOC banned subsequent private financing of the Olympic Games. 2004 saw legacy come full circle with the return of the Olympics to its historical home and the embracing of the linguistic aspect 'heritage'. Seen as a catalyst for the promotion of sport and culture in Greece, organisational mishaps, relative inexperience with hosting large-scale events and the challenging geo-political landscape of the post-911 world placed many substantial obstacles in front of the ATHOC. Many venues now stand abandoned and neglected and the Games are regarded as a contributing factor to the economic woes still entrenching the country to this day.

The reality of legacy is apparent; its prospectives at the Olympics Games and the two weeks of sport that surround it are now inextricably intertwined; one cannot exist without the other. Legacy is required to justify the expenditure and the Olympics are the necessary vehicle with which to bring it to fruition, never more the case than with London 2012.

### 2.10.2 London 2012 – A One Off Summer Wonder?

As acknowledged in section 1.2, the Department for Culture, Media and Sport (DCMS) anticipated the need to investigate the post-Games legacy of the Olympic Games. Presenting eleven areas of inquiry, the sixth read as follows: *to analyse whether or not Games-related development delivers a regenerated Lea Valley and East London and draws to related regeneration projects, for example, in the Thames Gateway.*

Prior to analysing the outcome of the Games-related development, its impetus, namely the LOCOG focus on legacy, is justified through a conceptual evaluation of the changing nature of legacy through five standout Olympic Games, framed against the four points of Gold & Gold. It is determined that legacy is an "evolving concept" which truly accelerated to the forefront of Olympic discourse from Rome 1960 onwards (Gold & Gold, 2008a). Each organising committee approaches it in a different way, takes hold of it and moulds it to suit its own demands, the demands of its city and the demands of its people. This malleability is the lure of legacy. Through its adaptability, it can be whatever the city wants it to be: the foot on the pedal of long-awaited infrastructure improvements, the means of repainting the city's image, the impetus for city-wide beautification. These ambitions cost money. Lots of it.

In London, the Olympics were to be the impetus for the "complete transformation of the portion of the lower Lea Valley between Stratford and Hackney (Gold & Gold, 2008b, p. 312). There would be an "environmental transformation, renewed social capital, 3600 new flats in the Olympic village and 9000 in the Olympic park area". Stratford centre would see a £4 billion metropolitan redevelopment with in excess of 100 shops, cafes, schools, hotels and more, expected to lead to employment of 200,000 workers (Newham, 2007). Documenting the expenditure on this mega-project is Bent Flyvbjerg, a Danish economic geographer with a substantive number of written works on the economics of such projects. One of these works, the 'Oxford Olympics Study: Cost and Cost Overrun at the Games (2012), details the size and financial risks of the Games with a closing chapter specifically focused on London 2012. Whereas the LOCOG bid documents forecasted a £2.375 billion capital budget (Gold & Gold, 2007), Flyvbjerg's post-Games analysis finds a final sports-related cost closer to \$15 billion dollars (in 2015 USD) (2016). At this cost, London was the most expensive Summer Olympics to date, second place belonging to Barcelona 1992 at \$9.7 billion. This high price tag, deceptively presented by the organisers as 'under-budget', represents one of the most

substantial peacetime expenditures of the UK government, all in the name of Olympic legacy. This is not a standout occurrence when it comes to the Olympic Games; with the intent of “establish[ing] the actual outturn costs of previous Games and the degree to which this exceeds projected budgets at the bid stage”, Flyvbjerg’s key findings are that the average cost overrun for Summer Games is \$5.2 million US dollars and that the Olympics have the highest average overrun of any type of megaproject; the Olympic Games have consistently exceeded its bid-stage budget without exception. Nearly half have more than doubled their budgets and London is no different. It is therefore of paramount importance that a justification is found for what was a burden upon the UK taxpayer. Just as Flyvbjerg insists that the “financial size and risks of the Games warrant study (2016, p. 3)”, so the enormous expenses behind the regenerative transformation of the Lea Valley require assessment. Was it nothing more than a “fig leaf for the enormous expenses required and incurred”(Gold & Gold, 2008a, p. 314)?

Evaluating the impact of this ‘striking regenerative transformation’ possesses its own challenges. Firstly, one must establish the counterfactual deadweight (Ploegmakers & Beckers, 2014) i.e. what would have happened if the stated urban regeneration policy did not exist? In the case of London, does this mean that Stratford - now, for the most part, transformed – would have remained a neglected East End corner of London? Indeed, without the Games, its vast expanses of post-industrial wasteland would have remained unoccupied. Secondly, urban regeneration is often a range of concocted and constituent programmes including but not limited to: infrastructure improvements, investments in the public realm, relocation of undesirable activities, acquisition and demolition of obsolete properties and the provision of building land in order to promote redevelopment. The challenge is therefore the disaggregation of the effects of these interventions in order to determine their isolated impact.

As is often quoted throughout this thesis, legacy is the *raison d’être* for the Olympic Games yet still no city has undergone a full evaluation of legacy from an Olympic Games. Challenges abound and the evaluation of the full legacy of the Olympics - given its theoretically limitless scope and conceptually fluid definition - ever appears to be an impossible undertaking. Indeed, it is acknowledged by academics that identifying and isolating specific impacts of the Olympics on regional economies is ‘at best an imprecise exercise’ (McKay & Plumb, 2001). Hence, focus on the sixth DCMS area of inquiry, reduces this analytical challenge of assessing the legacy ambitions of Lea Valley regeneration. Tapering the analysis into a more nuanced and finely-tuned statistical analysis has further benefits. One of the clearest economic indicators of the public realm investments associated with regeneration is the effect it has on house prices in the locality. Empirical evidence abounds; urban rehabilitation, of the sort seen in Newham, results in “immediate and steep price increases in price-level (Kauko, 2009, p. 102)” and therefore in order to assess the consequences of the Olympic-driven regenerative efforts, the forthcoming statistical analysis will focus on the house price dynamics within the London Borough of Newham.

The impact of the Games on the real estate market has been studied before to a number of conclusions. Analysing the experiences of a range of host cities, McKay and Plumb (2001) determine that the Games impacts are indirect and experienced over a long timeframe. An important point is made; “real estate impacts tend to be a consequence of decisions driven by other motivations, such as image and self-promotion, which provide indirect benefits to the sector (p. 2)”. Indeed, the assumed mechanism upon which the second half of this thesis rests is that urban realm improvements resulting from the London Olympic Games will lead to an increase in house prices within the Newham real estate market. Further insights from McKay & Plumb’s work is the differential real estate effect resulting from the

size and maturity of the local property market. Context is therefore important and the differences between cities is a crucial factor behind the impact of the Games on the host real estate market. Despite these differences, common motivations are acknowledged; all cities crafting an Olympic bid believe “that the benefits will be both far reaching and long-term (p. 4)”. This commonality does not extend as far as real estate sector performance. Consistent performance in the hotel industry (peaking market cycles in the Olympic years) is contrasted by the widely disparate residential market performance. Seoul and Barcelona are found to experience significant increases in housing and rental prices, whilst Atlanta and Sydney see little-to-no Olympic related boost. In conclusion, the major impact of the Olympics is found to be creation of new districts around the Olympic corridor, a phenomenon seen in Newham where the East Village residential quarter brought nearly 3000 new homes to the Queen Elizabeth Olympic Park (Moore R. , 2012). With documented incongruence amongst the residential market outcome of the Games, it is therefore an essential field of research for London and particularly Newham. Did the Olympics deliver a regenerated Lea Valley and East London? Section II will endeavour to answer that.

### 3. Section II: A Statistical Study

#### 3.1 Research Question II

*How successful was the intended legacy of the London 2012 Olympics and in particular, did the regeneration of Stratford as part of the London 2012 Olympics lead to direct benefit of the community as reflected through a change in local house prices?*

Section I of this thesis has presented a qualitative analysis of the legacy of five past landmark Olympic Games through a comprehensive and multi-faceted literature review of their legacies. A wide and varied range of source have been appraised against a consistent framing structure, allowing for an enhanced level of insight in to the conceptual evolution of Olympic legacy from its linguistic birth in Montreal to its more recent position at the heart of the London Olympic bid. This evaluation has allowed for a determination of the means by which the reality of legacy has exhibited itself, thereby setting the stage for Section II; an empirical study in to the intended legacy of the London 2012 Olympics, that “By staging the Games in this part of the city, the most enduring legacy of the Games will be the regeneration of an entire community for the direct benefit of everyone who lives there” (LOCOG, 2005). The evaluation of this goal from a statistical perspective will require a narrowing of the studied scope in contrast to that of Section I. Section I exhibited the evolving scope of legacy with each iteration of the Games and Section II will therefore focus on a more specific mechanism through which legacy imparted change upon its host. This mechanism under the microscope is the growing synergy between the Olympics and urban regeneration as cited empirically throughout Section I. Los Angeles, Barcelona, Atlanta and Athens are four Olympic Games which leveraged the financial clout of the Olympics into a transformative tool for the reshaping of their urban landscapes, much as London has done, and the assumed mechanism to be assessed is that the urban regeneration resulting from the London Olympic Games will lead to an increase in house prices within the London Borough of Newham.

Hence, the research question of Section II of this thesis will be:

*Did the regeneration of Stratford as part of the London 2012 Olympic lead to direct benefit of the community as reflected through a change in local house prices?*

The methodology by which this will be answered is set out in the following section.

#### 3.2 Methodology

In order to satisfactorily answer the research question a hedonic pricing model will be created, the aim of which will be to determine the existence and magnitude of the Olympic-driven effect on house transaction prices. Data will be collected from numerous sources, ranging from but not limited to the Land Registry of House Transactions, the Office for National Statistics (ONS), the London Data Store and the Business Register and Employment Survey (BRES). The collected dataset will be analysed using the statistical software STATA.

### 3.2.1 The Hedonic Pricing Model

The hedonic pricing model is a statistical estimation method which treats the value of the final good, in this instance, *house transaction price*, as the dependent variable, regressed upon the attributes of the good (Kavetsos, 2012). It is a form of revealed preference, in which the value of constituent elements of a final good can be determined. One of the earliest Hedonic pricing models was in the field of Land Economics. Constructed by G.C. Haas, it was applied to agricultural land prices; in his study, he focused on distance to the city centre and city size. Referred to as “The First Hedonic Analysis” (Colwell & Dilmore, 1999), Haas gathered data on farm sales in Blue Earth County, Minnesota. Whilst vastly simplified compared to modern hedonic analysis due to the lack of computational devices, Haas was capable of producing the following regression equation:

$$P = \alpha_0 + \alpha_1 B + \alpha_2 L + \alpha_3 S + \alpha_4 U,$$

where:

- P = price per acre adjusted for year of sale, road type and city size,
- B = depreciated cost of buildings per acre,
- L = land classification index
- S = soil productivity index
- U = distance in miles to the city centre (i.e. the market)

Aided by a substantial amount of self-collected data Haas performed a regression which, according to future scrutiny “stands up quite well to the standards of contemporary hedonics (Colwell & Dilmore, 1999, p. 623)”. The authors conclude that, whilst accurate and thorough, Haas cannot be conclusively stated to be ‘father’ of Hedonic Pricing Models. Furthermore, a strong case cannot be made for the influence of his study, with greater influence on the theory of hedonic pricing being credited to Wallace.

Houses are an interesting topic of study. Each has its own specific and non-transferable location occupied only by itself. Each has a unique bundle of characteristics and these characteristics are valued differently by different people and across geographical areas. As a combination of these factors, and others, the valuation of a house is not simple; it is a homogenous good which requires a specific form of analysis. This is where the hedonic pricing model makes its appearance. As a model, it allows “total housing expenditure to be broken down into the values of the individual components (Sirmans, Macpherson, & Zietz, 2005, p. 4)” through the assumption that the consumer derives utility from the various housing characteristics, and through the pursuit of maximum utility within one’s budget constraint, the value of this utility can be priced.

The Hedonic pricing model takes the following form:

$$Price = f(\text{Physical Characteristics}, \text{Other Factors})$$

This indicates that the price of a house is a function of its physical characteristics, such as square footage, number of bedrooms, presence of a garage etc. and other factors such as quality of local schools, accessibility etc. The hedonic pricing regression estimates give implicit prices of each of these estimated characteristics (Sirmans, Macpherson & Zietz, 2005).



The application of the hedonic pricing model to real estate is not a novel phenomenon. Many academics have applied this method, to case studies across the world and a review of just a small portion of these studies reveals the 'physical characteristics and other factors' appearing with relative frequency. Reviewing 125 hedonic pricing model studies from the last decade, Sirmans et al. presents the following insights into what has become one of the most popular and effective statistical tools in the analysis of house prices.

- Amongst the top twenty characteristics used to specify hedonic pricing model equations, the majority can be categorised as structural, internal, external or environmental.
- Structural characteristics of a house are the physical features of a house such as lot size, square feet, age, number of bathrooms and number of bedrooms. Internal features are those such as number and quality of bathrooms, presence of fireplaces, air-conditioning, hardwood floors.
- External features are those such as garage spaces, decking, swimming pools and porches. Environmental features are those such as neighbourhood, location, crime, distance from city centre, presence of golf courses in the locality, quality of local schools etc. These characteristics all interact to influence an individuals' valuation process of a house and therefore have a part to play in the transaction price.

### 3.2.2. Limitations and challenges of Hedonic Pricing Models

The hedonic pricing model does have some challenges and limitations which must be acknowledged before its implementation. Firstly, there are an almost limitless number of independent variables which can be included in the model. Sirmans et al. present some of the more obscure and infrequent characteristics appearing in their analysis such as the roof type, presence of a garden bird bath, garden sprinkler systems, double ovens in the kitchen etc. There are countless variables which, with a little bit of imagination and explanation could logically be presented as an influencing factor of house transaction prices. The difficulty is that there can often be high levels of correlation between these variables, leading to estimation problems. Secondly, the estimated coefficients within a hedonic pricing model are location-specific and are therefore difficult to generalise across different geographical locations. The model also assumes that all transactions are conducted with prior and perfect knowledge of the independent variable characteristics i.e. the buyer is fully aware of accessibility and crime within a neighbourhood; this is obviously not the case.

Despite these limitations, the hedonic pricing model is the best capable model of estimating the effect of (changes in) characteristics of houses in the valuation process.

### 3.3 Data Description

The use of a hedonic pricing model is a data intensive process requiring a vast amount of information on the local housing market. As the key hypothesis of this section of the thesis is the regeneration of Stratford as a result of the London 2012 Olympics, the dataset consists of real estate data from the London Borough of Newham in East London. **Figure 1** shows the location of the borough within London.

**Figure 1:** Location of the London Borough of Newham within Greater London



Source: Wikipedia

In order to determine the effect of the Olympic Games on the housing transactions within the above area, a dataset is compiled consisting of 4795 observations of transactions between the years 2007 and 2015. The variables utilised are described in detail in the following section.

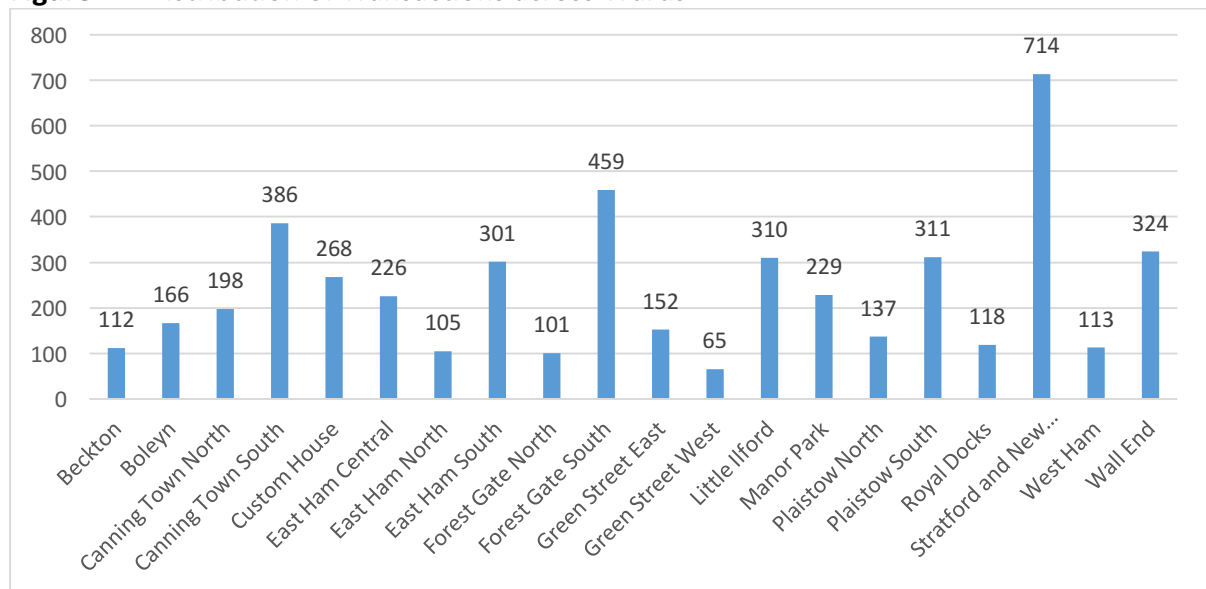
### 3.3.1 Variables

#### House Transaction Price

The dependent variable of this study will be the '*House Transaction Price*'. This, as the name describes, is the price, in British pounds, for which a property was sold. This variable is sourced from the Land Registry via Mouseprice. The Land Registry is a UK Government non-ministerial department which registers the ownership of land and property in England and Wales. Whilst predominantly used for the safeguarding of land and property ownership, as a by-product of this, they are the biggest holder of information of housing transactions within England and Wales. Mouseprice is a commercial website which provides comprehensive and up-to-date housing data. This website allows for the downloading of information from the Land Registry with specifications for location and date of transaction. Within the regression equation of this thesis, the exact variable used will be the natural log of transaction prices. The primary benefit of taking the natural log of transaction prices is that the coefficients of the independent variables can be interpreted as percentage changes. This aids ease of interpretation. To allow further analysis, the date of the transaction and postal code of the house are also collected amongst other variables.

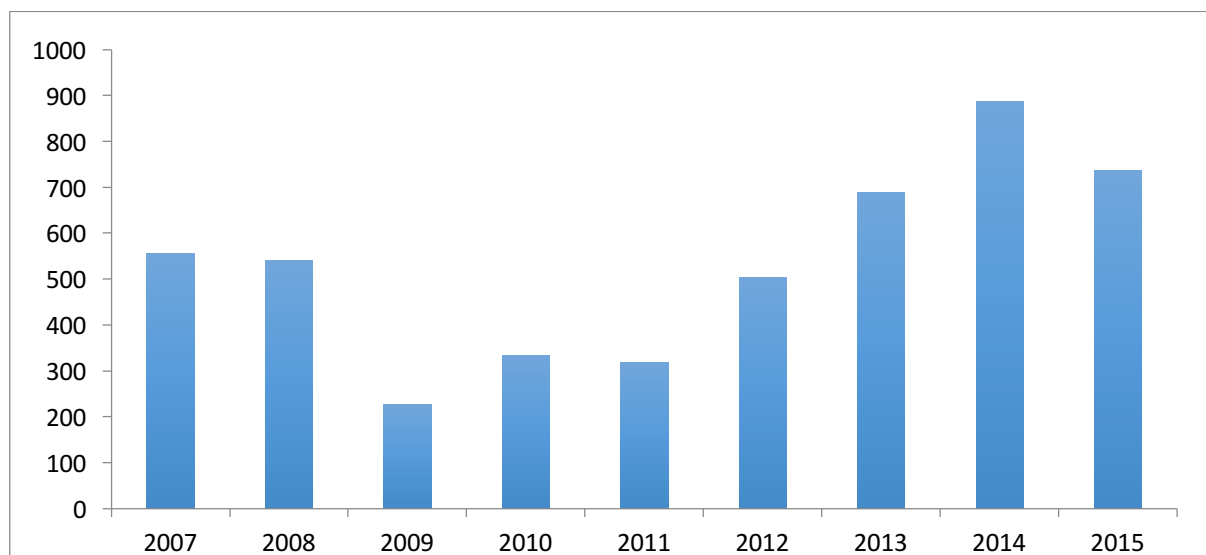
One of the primary challenges of a Hedonic Pricing Model is the broad data requirement. For each individual transaction, a host of neighbourhood characteristics are required. Furthermore, in order to improve the effectiveness of the pricing model, it is better for this data to be spatially and temporally related to the individual transaction. Data limitations lead to many observations lacking the required spatial variables and therefore such observations were dropped from the dataset. As a result of this data cleaning, from a total of 9833 observations, a lack of data reduces the total usable dataset to 4795 for which all data is available. **Figure 2** shows the distribution of transactions across the wards within the London Borough of Newham. **Figure 3** shows the distribution of transactions by year and lastly **Figure 4** shows the distribution by price.

**Figure 2 – Distribution of Transactions across Wards**

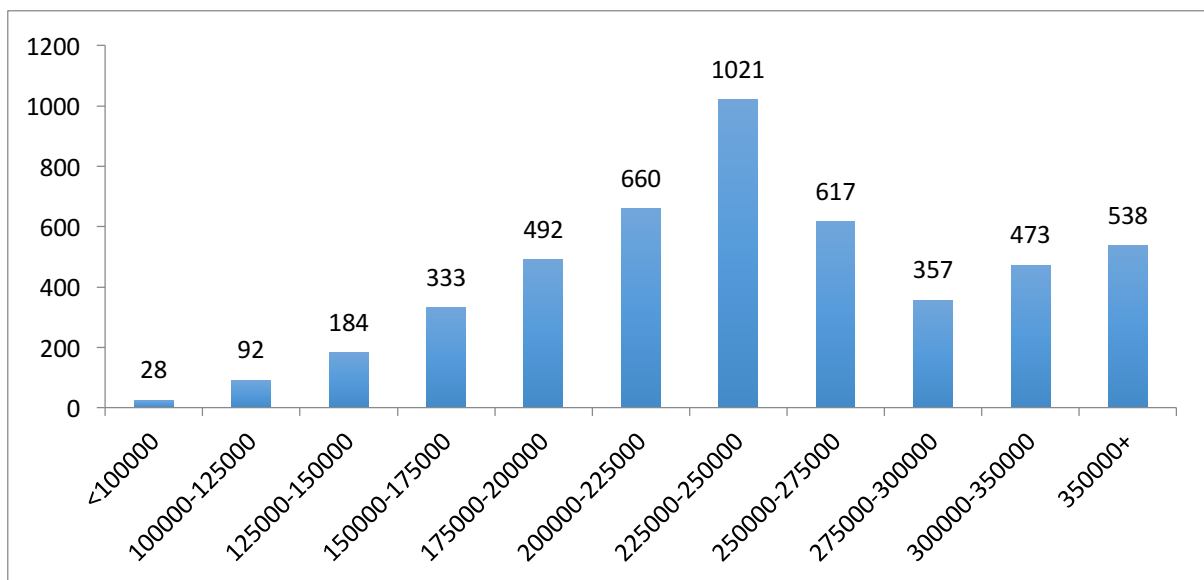


As can be seen in **Figure 2**, there is a large proportion of transactions within the Stratford and New Town Ward. This is most likely a result of the sale of apartments which previously comprised the Olympic Village in the Queen Elizabeth Olympic Park.

**Figure 3 – Distribution of Transactions by Year of Sale**



**Figure 4–** Distribution of House Transactions across Price



Due to the nature of this statistical study, the majority of independent variables are incorporated to improve the efficiency of the estimation of the hypotheses. They are the aforementioned ‘characteristics’ at both a dwelling-specific and neighbourhood-level of a property as presented by Sirmans et al. (2005) and appear with relative frequency throughout the studies examined. By utilising as many as feasibly possible, the model becomes a more effective tool to achieve the ambition of determining the Olympic-effect on house transaction prices.

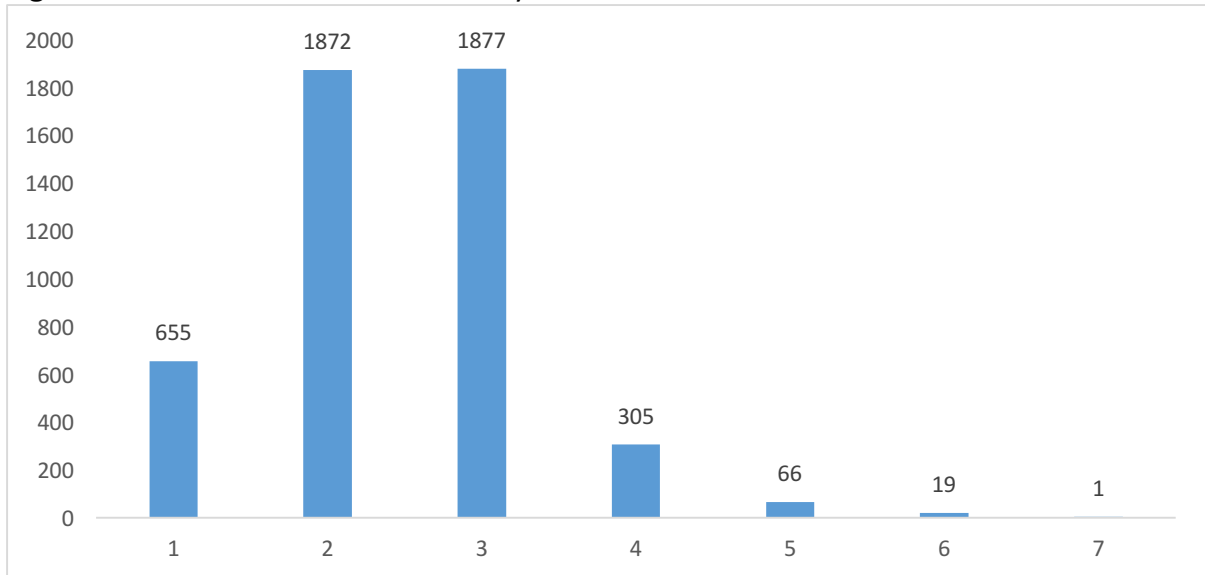
As part of this Olympic-driven effect, a subsequent hypothesis of this study will aim to assess the effect of a key year in the Olympic site development. To aid this, the year of sale is collected for each transaction.

#### Number of Bedrooms

Number of bedrooms is a very UK-centric figure, often the first mentioned characteristic of a house when it is being marketed. New-build developments are commonly advertised as “mix of 4-5 bedroom executive homes” or “1-2 bedroom modern apartments”. This is contrary to mainland Europe and the USA real estate markets, where square footage/metres is a measured and broadcasted characteristic of a property. As an additional bedroom is an indicator of a larger, more spacious home, it is expected that the number of bedrooms will have a positive and significant effect on the transaction price of a property. Within this regression, the variable ‘bedrooms’ will be mean-centred; i.e. the mean will be subtracted from all observations of ‘bedrooms’. With a mean of 2.44, interpretation of the resultant coefficient will refer to a percentage change in the transaction price of a property resulting from a unit increase in bedrooms from this mean value.

**Figure 5** shows the distribution of the observed transactions by number of bedrooms.

**Figure 5:** Distribution of Transactions by number of bedrooms



### Census Ward

Census Wards are an electoral subdivision of the local authority. They are the key building blocks of the UK administrative geography and define the spatial units used to elect local government councillors. Within this study, the Census Ward of a property is not used as a variable but is a crucial feature of the model due to its micro-scale. One of the most important aspects of a house's transaction price is its location. It is the most unique and inimitable aspect of a property and cannot be transferred and therefore it is important to collect variables at a geographically specific level. In order to achieve this, the postcode of each property is used to determine its latitude and longitude and subsequently its census ward within the London Borough of Newham. **Figure 6** show the 20 Newham census wards and their location within the borough.

**Figure 6:** Wards comprising the London Borough of Newham



Contains National Statistics data © Crown copyright and database right 2017 and contains Ordnance Survey data © Crown copyright and database right 2017

The functionality of this spatial distinction is that it allows for the neighbourhood characteristics of a property to be collected at a geographically specific level. As neighbourhood characteristics will vary from property to property, even between neighbouring houses, the use of census ward data provides a middle-ground between the near-impossible task of collecting neighbourhood characteristics for each individual property and the other extreme of using widely available local authority-level statistics. Hence, through the use of census wards, the variables (which will subsequently be described) of crime, HORECA employment and Retail employment are collected and assigned to each observed property transaction based on a) the year of sale and b) the ward within which the property is located.

## Crime

Crime defines an ‘action or omission which constitutes an offence and is punishable by law’ (OED, 2016). As to its effect on house transaction prices, in the US there is evidence that “crime rates do affect property values” and so strong is the perceived effect of crime rates on local house prices, it is reported that up to 5 million Britons would be “put off reporting crime in their area because it would hit their house price (Boyce, 2014)”. Further analysis shows

that, in the UK, criminal damage to property (vandalism, graffiti and arson) has a “huge impact on the value of property in a given area (Gibbons, 2003, p. 16)”. Hence, it is no surprise that in Sirman’s aforementioned analysis of the composition of the modern hedonic pricing model, crime is the most frequently occurring characteristic in the ‘Environmental – Neighbourhood & Location’ category. Performing a statistical analysis of the relationship between crimes and property prices, Economic Geography academic Steve Gibbons utilises the geographical detail of Metropolitan Police (London) data to determine the effects of criminal incidents on house prices. It is put forward that prices fall by 3.9% for an additional five reported incidents of criminal damage per year. With further controlling of local amenities, Gibbons gleans that incoming residents perceive criminal damage as signalling higher crime in an area, in line with the Broken Window Theory of Wilson and Kelling. This theory indicates that vandalism, whilst not directly linked to serious crime, leads to increased fear and withdrawal from residents, which then allows more serious crime to move in. Indeed, Gibbons concludes that physical disorders such as graffiti and vandalism may be symptomatic of deeper disruptions in social cohesion and community expectations. Empirical analysis by Tita et al. (2006) discover that total crime has a “negligible effect on housing values across the city of Columbus (p. 312)”. However, when advancing with a better-specified definition of crime, it is found that violent crime is a significant and negative determinant of house values along with property crime. Based on this analysis, the variable ‘*Crime*’ used within this statistical study is the total count of offences classified as:

- Violence against a Person and,
- Criminal Damage

Both counts are taken at a ward-level for the financial years 2007 to 2015. This data is taken from the London Datastore and is summed and then divided by the ward level population (in millions). It is expected that the crime rate will have a negative and significant effect on the transaction price of a house.

## Amenities

*“Living near Waitrose could add £38,666 to your house price, survey says”*. Whilst, at its core, a sensationalist headline, this statement finds credence within a 2016 Lloyds Bank research report which makes claim to the existence of this “Waitrose Effect”, named after the upmarket British supermarket chain (Furness, 2016). Comparing the average selling price and proximity to a supermarket the surveyors find a 10% (£38,666) premium for houses located within the same postal districts as Waitrose supermarkets. The effect exists for the full range of UK supermarkets down to Aldi, with a much smaller 1% (£1,333) premium. Whilst causation/correlation questions abound, in the simplest of terms, Waitrose, and other supermarkets, are seen to increase house prices and therefore fall under the category of neighbourhood amenities.

An amenity describes the quality of being pleasant or attractive and thereby increasing value. Neighbourhood amenities therefore describe qualities of an environ which make it an attractive place to live through the provision of an enhanced living experience. Parks, schools, small retail and transit are other examples of such amenities (Envision Tomorrow, n.d.) and are shown in numerous studies to be of added value in the eye of local residents. A New Zealand study evaluates the added value placed on such amenities by residents of Auckland. Here, urban amenities are defined as specific urban facilities that “contribute to the urban living experience of resident” (Kelly, 2006). Linked to the daily life and needs of residents, Randall (2008) lists examples such as grocers, convenience stores,

schools and professional services. There seems to be a general consensus amongst researchers that there are a range of amenities which are “important to a household’s sense of place (Howie, Murphy, & Wicks, 2010, p. 235)” and therefore are an uplifting factor in the transaction prices of properties.

The crucial nature of urban amenities in this study is the effect they have on the urban economy within a locality. As the intended aim of this thesis is to determine the existence and magnitude of the Olympic-driven effect on house prices, it is crucial to account for and subsequently control for additional factors which may also influence this. Empirical studies on the influence urban amenities can have on house transaction prices conclude that a wealth of such amenities can attract economic activity to a location; “the provision of amenities generates urban advantages that perpetuates the concentration of economic activity and population in, and in closer proximity to, them (Partridge & Alasia)”. Such a theory forms the backbone of research by Glaeser and Gottlieb (2006). Studying the urban resurgence of cities since the 1990s, Glaeser and Gottlieb propose two main explanations; an increasing importance of knowledge in the economy which places cities at a comparative advantage and a growth in demand for high-end urban amenities which has increased the desire to locate in cities. Cities, the authors believe, have experienced a ‘renaissance as places of consumption’ rather than production as was historically the case. Combining this with the theory of spatial economics, it is proposed that given relatively easy migration from a mobility perspective, demand will be directed towards locations rich with urban amenities. This therefore brings us to the conclusion that as accessibility and convenience of urban amenities contribute to quality of urban life experiences (Rappaport, 2008), people will be willing to pay more for this accessibility in the form of higher transaction prices for properties.

The manner by which urban amenities can be measured within a locality poses numerous challenges, as a result of both the subjectivity involving what can be defined as an amenity and the subsequent task of quantifying and measuring it. As a means of resolving this challenge, proxies will be used - measures of variables which will serve in the place of an immeasurable variable. In order to measure the level of urban amenities within the London Borough of Newham, Census Ward-level employment figures will be utilised as taken from the Business Register and Employment Survey (BRES) to determine the relative size of two economic industries within each ward. The BRES, as collated by the UK government, is the official source of employee and employment estimates by detailed geography and industry (ONS, 2016) . The survey, collects a sample from all 2 million businesses across the UK which allows the ONS to produce employee and employment estimates by detailed geography and industry split. As the premier source of information on employment by detailed geography and industry, total ward-level employment figures in the following two industries have been collected for the entire borough of Newham:

- Retail
- HORECA

It should be noted that for security and confidentiality reasons, all values are rounded to the nearest five.

The variable ‘*Retail*’ is the summation of the ward level employment in the following industries:

- Retail sale in non-specialised stores
- Retail sale of food, beverages and tobacco in specialised stores
- Retail sale of cultural and recreation goods in specialised stores.



The variable 'HORECA' (HOTels, REstaurants & CAFes) is the summation of the ward level employment in the following industries:

- Hotels and similar accommodation
- Restaurants and mobile food service activities
- Beverage serving activities

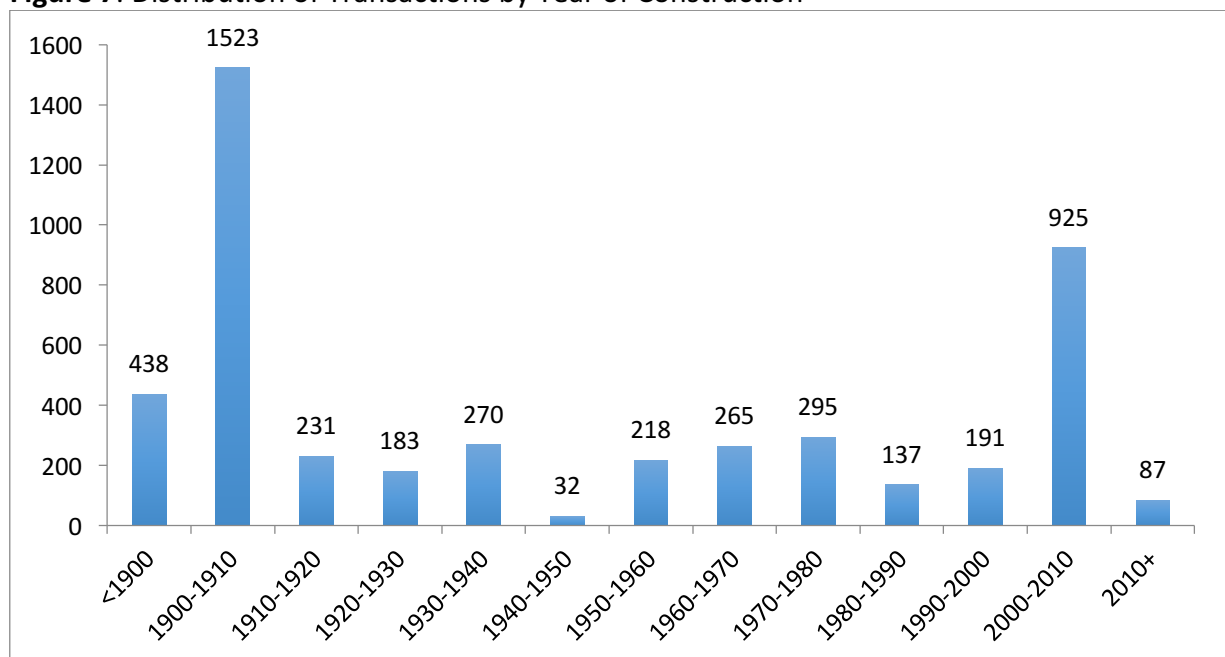
The total yearly ward-level employment in the retail industry will act as a proxy for the levels of retail amenities within each ward with the expectation that the presence of such amenities will have a significant effect on the transaction prices of properties in the locality. In a similar fashion, the total yearly ward-level employment in the accommodation and food services industry acts as a proxy for the volume of neighbourhood amenities such as restaurants, cafes and bars. Employment numbers have been collected from 2009 until 2015. In order to minimise the data lost due to missing values, ex ante value for 2007 and 2008 values have been forecast in Excel.

### Year Built (Age)

The age of a property (or another age related variable such as year built or its natural log) features in 100 of the over 120 hedonic pricing studies reviewed by Sirmans et al. As the most frequently occurring characteristic, it typically has a negative and significant sign, though in some instances it is positive. It typically is implemented as a measure of depreciation and age will therefore be calculated by determining the house age during the year of transaction using the construction year of each property as taken from the Land Registry. Hence, age will equal:

$$Age = Year\ of\ Transaction - Year\ of\ Construction$$

**Figure 7:** Distribution of Transactions by Year of Construction



### Property Type

House type is regularly included within hedonic pricing models due to its significant influence on the transaction price. Within the UK housing market, the most commonly cited property

types are detached, semi-detached, flat, terraced house and bungalow. A Nationwide study determines the ‘value of a property if only the property type is changed’ against the reference type of Detached bungalow and finds a declining value if the property is detached, semi-detached, terraced or a flat (Nationwide, 2016). These distinctions are therefore of significance to the UK real estate market and will be implemented in the regression as categorical variables with four available categories (the Land Registry does not categorise bungalows). These categories are:

**Table 2:** Frequency of Observation by Dwelling Type

Dwelling Type	Observations
Detached	21
Semi-detached	115
Terrace	2805
Flat	1854

### Accessibility

Accessibility in this thesis refers to the proximity to a London Underground (LU) or Docklands Light Railways (DLR) station. As established earlier, neighbourhood amenities make an area a more attractive place to live through the provision of an enhanced living experience. Public transport can provide access to jobs, leisure and more and therefore by inference, can be presumed to enhance living experience and therefore boost transaction price.

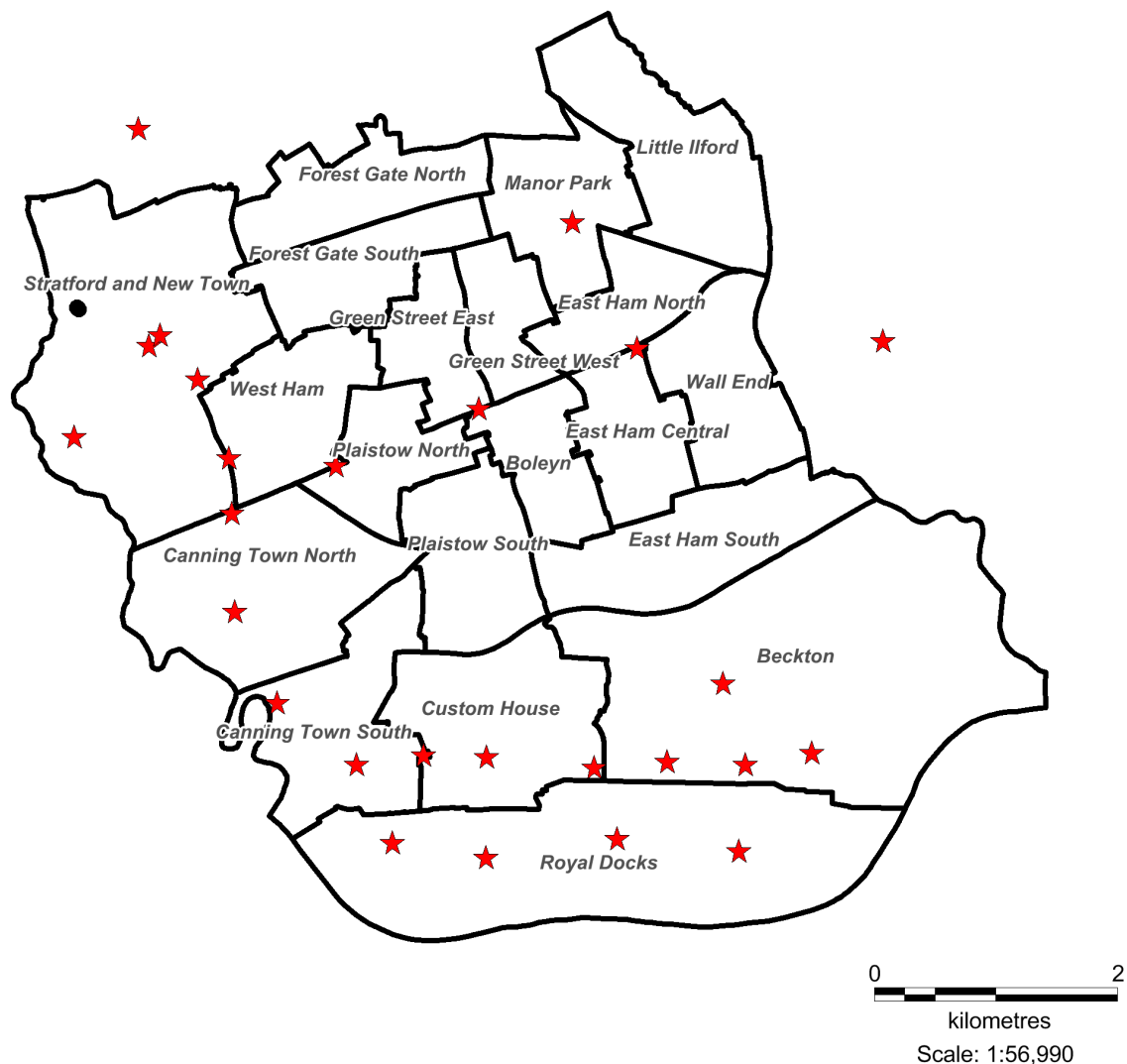
Empirical studies on the impact of accessibility on house prices are varied in conclusion. Sirmans (2005) concludes that it is an insignificant factor. Whilst UK-specific Nationwide analysis discovers a premium for transactions within 1500m of LU, Manchester Metrolink and Glasgow urban rail stations (Collinson, 2014). In numbers, Nationwide estimate a £42,000 uplift to the price of the average London property as a result of being within 500m of a tube station. When compared to the premium for Manchester and Glasgow, this is particularly substantial given the denser nature of the London public transport network; approximately 94% of London’s homes are within 1500m of a station.

Further insights in to this effect can be found in the works of Adair et al. (Adair, McGreal, Smyth, Cooper, & Ryley, 2000). Constructing an accessibility index across the Belfast Urban Area, a hedonic pricing model is used to reach two main conclusions. Firstly, at a city-wide scale, accessibility is of little significance with regards to house price variation. Secondly, “at a sub-market level, particularly in lower-income areas” when income is constrained, accessibility accounts for a larger variation in house price. The conclusion that it is therefore important to investigate at the sub-market level, lends credence to the spatial focus on the London Borough of Newham seen within this model.

Within this study, the distance to the nearest public transport station will be calculated and implemented in metres. Latitude and longitudes of each property have been determined through the postal codes attached to each transaction from the Land Registry. Latitudes and longitudes of LU and DLR stations within the London Borough of Newham have been collected from Google Maps. Using the Pythagorean Theorem, the straight line distances to the nearest public transport station have been calculated for each property and this will form the variable ‘Accessibility’. As this variable therefore reflects an increasing distance from a public transport station, it is expected that its coefficient will reveal a negative

and significant effect on the transaction price. The location of all public transport stations considered within this study are shown on **Figure 8** below.

**Figure 8:** Public Transport Stations within and in the vicinity of the London Borough of Newham



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### 3.4 Distance (The Olympic Effect)

The variable ‘*Distance*’ is a measure of the straight-line distance of each property from the centre-point of the Queen Elizabeth Olympic Park, measured in metres. As the predominant Olympic-driven regeneration, to the tune of £12 billion (Wainwright, 2014), the investment and transformation of what was previously an industrial wasteland in the corner of the borough is the most visible and defining indication of the Olympic effect in Newham. Therefore, in order to proxy for the strength of this Olympic-effect, proximity to the park will form the variable by which this is measured. The centre of the Olympic Park is defined as latitude 537867 and longitude 184581. Within the dataset of this study, the observations span across approximately 11km from the Olympic Park, and it is highly unlikely that the proximity

effect theorised exhibits itself in a homogenous nature across this area. Indeed, there is empirical evidence that the “benefits from stadia might exhibit an unequal spatial distribution (p. 206)” (Ahlfeldt & Maennig, 2010) and whilst the focus of the study is not just the Olympic Stadium but the entire park, it is equally unlikely that a marginal change in proximity to the park will have the same theorised impact across the full range of distances covered within this study. Empirical support for the non-linearity of this relationship abounds.

Ahlfeldt and Maennig’s present a 2010 study on the property price impact of sports arenas in Berlin. As with London 2012 and every modern Olympics before it, substantial quantities of often public money is directed into these projects with politicians affirming “good investments, [job] creation and attracting businesses and tourists”. With growing academic opposition to this discourse the authors theorise that the spatial scope of past studies may have undue influence on the consensus of resistance. The two arenas in question are the Max-Schmeling arena and Velodrom/Swimming-Arena in the Prenzlauer Berg district of Berlin.

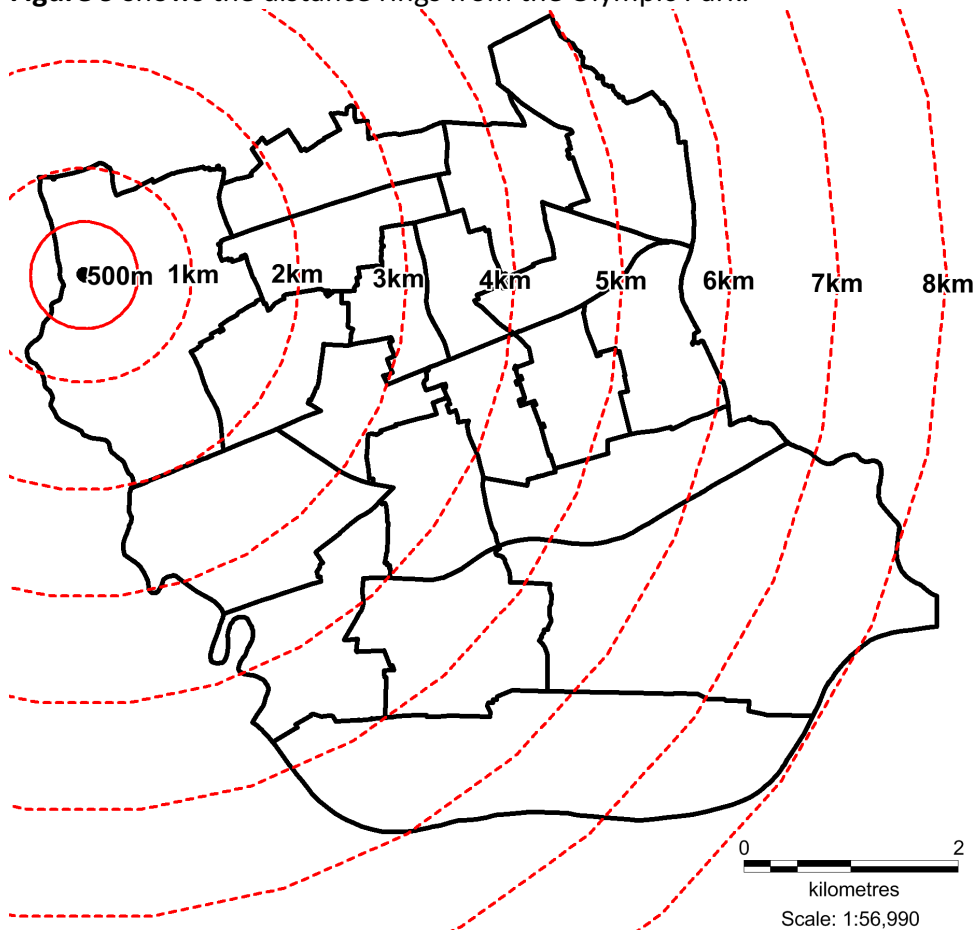
The commonalities between Prenzlauer Berg and the London Borough of Newham are worthy of note; as a former district of the East Bloc, it suffered from an economic deficiency not dissimilar to the deprivation which previously gripped Newham and in both instances, sports related development was the impetus for regeneration with “special attention paid to appealing architecture...incorporation into park landscapes...[connections] with local public transportation (p. 207)”. Equally, the differences are apparent; whilst Prenzlauer Berg quickly gentrified after the fall of the wall, Newham’s economic trajectory has lagged far behind that of London as a whole; though but a meander of the Thames from Canary Wharf, it has not shared its prosperity. With both areas in need of regeneration, Ahlfeldt et al. develop a hedonic pricing model, extending it to capture the impacts of the arenas on local land values. The introduction of mutually exclusive distance rings extending to 5000m from each arena allows for a determination of the reach and potency of the land value effect. The results suggest that a reach of “a distance of 3000m (p. 219)” with varying strength across 1000m bands. For the Velodrom in particular, the impact is strongest within 1000m of the arena, “decreasing with distance and disappearing within the 2000-3000m ring (p. 219)”. Hence, empirical support for a ‘greater focus on the spatial aspects of sport-related economic effects’ is evident. Such a focus is not limited to the work above – Tu (2005) addresses the impact of stadium construction on housing values in a 2005 study. Turning his focus to the FedEx Field in Maryland, Tu acknowledges the dearth of empirical evaluation of the economic impact on host communities and therefore utilises a hedonic pricing model to determine the price differentials arising from varying proximity to the FedEx Field. Whilst it is determined that properties close to the site of the FedEx Field sold at a discount, this differential is found to have pre-dated the stadium and actually reduced after the completion of the construction period. Proximity is found to positively influence property prices over a 2.5-mile distance, leading to an aggregate value increase of \$42 million.

One fact is made clear by these two studies; it is of paramount importance to the credibility of this regression to allow for a non-linear relationship between ‘*distance*’. Based upon the methodology of Ahlfeldt and Maennig, mutually-exclusive distance rings are crafted based upon the ‘*distance*’ variable. Henceforth referred to as ‘Bands’, these distance rings have been calibrated to best display the scope and potency of the Queen Elizabeth Park proximity effect. The discarded calibrations are set out in **Appendix C** whilst the utilised arrangement (Calibration 2) is set out in **Table 3** below.

**Table 3:** Distance Band Calibration

Distance Band	Distance from centre of Olympic Park (metres)
Band A	500-750
Band B	750-1000
Band C	1000-1250
Band D	1250-1500
Band E	1500-1750
Band F	1750-2000
...	...
Band Z	6750 – 7000
Band AA	7000-7500
Band AB	7500-8000

Figure 9 shows the distance rings from the Olympic Park.



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The integration of well-calibrated distance bands sufficiently allows for an empirically supported non-linear Olympic effect and therefore will be implemented in Hypothesis 1.

### 3.5 Data Structure

The dataset as used in this statistical analysis takes the form of a spatial panel dataset where each of the 4795 observations references a set of the aforementioned variables, assigned to

one property. As a spatial panel dataset, these observations are distributed spatially across the London Borough of Newham and temporally between the years 2007 and 2015. Acknowledging that the variables reference a specific observation, the dataset is pooled by observation. Additionally, to acknowledge the temporal aspect of the dataset, year dummy variables are integrated in to the model for all years (but the base year, in this instance 2007). **Appendix A** provides a short summary of the full set of variables, including sources, average values and standard deviations.

### 3.6 Multiple Tests

Prior to conducting a regression, the dataset must be assessed against the OLS assumptions in order to ensure that the resultant estimators are the Best Linear Unbiased Estimators (BLUE). This indicates that the error terms have expectations of zero and are uncorrelated, with equal variances. Determining if OLS is indeed BLUE requires testing against the Gauss-Markov assumptions (Wooldridge, 2013). These are:

1. The model is linear in its parameters
2. There is a random sample of observations
3. There exists no perfect collinearity amongst the independent variables
4. The error term has an expected value of zero given any values of the independent variable
5. The error term has the same variance given any values of the explanatory variables.

Within the dataset utilised in this regression, there is an inherent grouping of observations by both a spatial and a temporal dimension. Therefore, there are further assumptions which must be satisfied in order for OLS to be BLUE. This assumption is that there is no serial correlation; the errors in two different time periods are uncorrelated and the errors across census wards are uncorrelated. In the instance in which the errors are correlated, the standard errors are invalid and due to a) the time-component of the error terms within panel data, and b) the neighbourhood level variables being assigned at a ward level, this correlation of errors will be apparent. The solution used within this analysis is therefore to cluster the standard errors, which ensures that they are robust to any form of serial correlation and heteroscedasticity. In order to do this each observation is assigned a unique id code based upon the year and census ward in which the transaction took place. The further tests against which the dataset is analysed are set out in the following sections.

#### Multicollinearity

Multi-collinearity refers to the situation in which there is “correlation among the independent variables in a multiple regression (Wooldridge, 2013, p. 84)”. It describes a high, but not perfect (=1) correlation between two or more variables within the regression and can lead to statistical concerns. Assumption 3 of the multiple linear regression states that there must be no perfect collinearity amongst the independent variables and therefore a correlation coefficient matrix is produced to ensure that this is not the case. The existence of multicollinearity does not influence the overall predictive power of the regression, it does reduce the efficiency of the estimated coefficients.

The correlation coefficient matrix can be found below in **Appendix B**

As can be seen in **Appendix B** high collinearity (in excess of 0.75) exists between the variable pair Retail & HORECA. This collinearity is not surprising; as the measures of the existence and magnitude of the retail and HORECA industries in the locality,

As a result of the high collinearity between Retail and HORECA and the statistical insignificance of the Retail variable, the variable will be dropped from the regression. Additionally, there is high collinearity between the categorical variables of house type. Due to their mutually exclusive nature, this is to be expected.

### Heteroscedasticity

Heteroscedasticity refers to the statistical phenomenon in which the variance of the error term differs given different values of the explanatory variable. Whilst heteroscedasticity does not result in biased estimators, it does affect the variance and causes bias amongst the standard errors. A solution to this is to cluster the standard errors, which is already conducted as a response to the serial correlation resulting from the structure of the dataset.

### Serial Correlation

Serial Correlation refers to the incident in which the errors in two different time periods are correlated (Wooldridge, 2013, p. 353). In order to determine the existence of serial correlation amongst the dataset, the fully specified regression as detailed in **section 3.8** is ran. Through the prediction of (the natural log of) Transaction Prices, the residual (error term) and its lag are created. By performing a subsequent regression of the following form:

$$residual_t = residual_{t-1} + \varepsilon,$$

... it can be determined if the error term in a previous year (t-1) is a statistically significant determinant of the residual in the current year (t).

The statistical output of this regression is displayed in **Table 4**.

**Table 4:** Serial Correlation Test Output

VARIABLES	(1) Serial Correlation Test
residual_lag	0.011 (0.014)
Constant	4.178 (1,070.080)
Observations	4,794
R-squared	0.000

Standard errors in parentheses

\*\* p<0.01, \* p<0.05

The statistical insignificance of the variable '*residual lag*' shows that there is no statistical evidence for serial correlation amongst this dataset.

### 3.7 Robustness & Model Specification

In order to enhance and ensure the robustness of this is the statistical analysis within this thesis, the variables and their implementation with the model will be further refined through the testing of alternatives.

#### 3.7.1 Construction Year Cohorts & the Age Variable

In its current format, the variable *age* assumes that the resultant effect on transaction prices is linear. This is a crude and most likely incorrect means of measuring the effect of the age of a property on the transaction price. In actuality, there is empirical evidence of a non-linear relationship between these two variables. As stated in **section 3.3.1**, age is typically implemented in hedonic pricing models as a measure of depreciation (Rehm, Filippova, & Stone, 2006); yet this overlooks the existence of a positive effect arising from an increase in the age of a property. Thus referred to as the ‘vintage effect’, it arises when individual tastes and preferences shift to older homes (Rubin, 1993). Hence, whilst in many cases “a premium is paid for unit newness (p. 233)”, there is a demand-side component to property values which changes with time. Rehm et al. investigate this empirically, their results corroborating the existence of this ‘vintage effect’ and therefore lending credibility to the subsequent statistical decision to implement an age variable with the potential for a non-linear relationship with transaction prices.

There are two potential methods by which the non-linear relationship can be implemented, and therefore both shall be tested, with the best performing method carried through to the final specification of the regression. The first attempted method is to implement a set of dummy variables built on bands of year of construction of a property. This will allow for different construction years to have varying coefficients and therefore non-linear relationships with the transaction price of a property.

**Table 5** shows the frequency of observations by year of construction.

**Table 5:** Frequency of Transactions by Year of Construction/Cohort.

Cohort	Year of Construction	Frequency of observations
Cohort 1	1800-1850	2
Cohort 2	1850-1875	26
Cohort 3	1875-1900	410
Cohort 4	1900-1910	1523
Cohort 5	1910-1920	231
Cohort 6	1920-1930	183
Cohort 7	1930-1940	270
Cohort 8	1940-1950	32
Cohort 9	1950-1960	218
Cohort 10	1960-1970	265
Cohort 11	1970-1980	295
Cohort 12	1980-1990	137
Cohort 13	1990-2000	191
Cohort 14	2000-2010	925
Cohort 15	2010-2020	87



As can be seen in **Appendix D** all cohorts, are statistically insignificant and therefore the year of construction cohorts will be not implemented in the final specification of the regression.

The second method of allowing for a non-linear relationship between the age of a property and its transaction price is through the use of band delineated into decade sets, beginning at an age of 0 (when the year of sale and construction are the same). **Table 6** shows the frequency of observations by age of property during the year of sale.

**Table 6:** Frequency of Transactions by Age during year of sale/Cohort.

Cohort	Age Range of property in years	Frequency of observations
Cohort 1	0-10	808
Cohort 2	10-20	345
Cohort 3	20-30	143
Cohort 4	30-40	192
Cohort 5	40-50	297
Cohort 6	50-60	243
Cohort 7	60-70	123
Cohort 8	70-80	133
Cohort 9	80-90	245
Cohort 10	90-100	217
Cohort 11	100-110	733
Cohort 12	110-120	1067
Cohort 13	120-130	177
Cohort 14	130-140	52
Cohort 15	140-150	15
Cohort 16	150-160	1
Cohort 17	160-170	2
Cohort 18	170-180	0
Cohort 19	180-190	0
Cohort 20	190-200	1
Cohort 21	200-210	1

The age bands, statistically referred to as ‘cohorts’ will be implemented as dummy variables, taking the value ‘1’ if a property was of an age between the relevant range and ‘0’ if otherwise. The addition of the age cohort variables will allow for a range of coefficients and therefore effects of the age of a property on its transaction price outside the strictly linear relationship theorised before.

As can be seen in **Appendix E**, all cohorts, except for Cohort 17 (160-170 years) are statistically significant and the goodness-of-fit of the model has increased. Therefore, the age cohorts will be implemented in the final specification of the regression.

### 3.7.2 Anticipation Effect

As established in **Section 3.9.3**, hypothesis three states “The Olympic-driven price premium, as inversely measured by variable ‘Distance’ will be stronger in the year 2014 than in other years”, implicitly assuming that the Olympic-driven price premium will only exist in 2014. In

reality, knowledge of the Olympics coming to Newham was widely-known as of the host city announcement on 06 July 2005 and coupled with empirical evidence of anticipatory changes in house prices, there is scope for an Olympic effect in years prior to the parks' opening. This anticipatory effect is well explored; focussing specifically on stadium externalities, Ahlfeldt and Kavetsos (2010) note that "real estate markets tend to value the stadium effects in anticipation (p.3)" or even "as soon as new information enters the market (p.20)". Acknowledged as both a characteristic and a neighbourhood amenity, stadiums are deemed to have a likely significant impact on the value of proximate properties with even the announcement of the construction of a sports facility shown to have substantial positive price impacts (Dehring, Depken, & Ward, 2007). Using a London-based hedonic pricing model, Kavetsos finds a price increase of 3.3% for properties in the Olympic host borough resulting from the July 2005 announcement. In order to investigate this anticipation effect, interaction variables will be generated for each year 2007-2015 and the *Distance* variable. These variables -  $Y_1D$ ,  $Y_2D$ ,  $Y_3D$ ,  $Y_4D$ ,  $Y_5D$ ,  $Y_6D$ ,  $Y_7D$ ,  $Y_8D$  – will be applied in various forms of the regression in order to determine the best means of implementation. These forms are:

- (1) Original regression (Transaction Prices)
- (2) Original regression using log transformed transaction prices
- (3) As above with addition of Year of Construction cohorts
- (4) Regression (2) with addition of Age during year of sale cohorts

The output of form (4) can be seen in **Appendix F**.

The interaction effects are insignificant in each and every form of the regression equation and therefore will not be implemented in the model

### 3.7.3 Ward Dummy Variables

In the forthcoming limitations in **section 3.12**, it is acknowledged that by aggregating data at a ward-level, individual properties are homogenised based on location. Indeed, there may be smaller pockets to the market than currently captured by the ward breakdown; each with different types of house structure, aesthetic and market variance. Whilst the standard errors are clustered by year and ward, a further means of investigating an as yet neglected ward-level effect on property transaction prices is through the use of a dummy variable for each ward. The results of this regression are shown in **Appendix G**.

The outputs show that, whilst the majority of the ward dummy variables are statistically significant, their inclusion leads to the insignificance of the neighbourhood level characteristics (Criminal Offences, Size of HORECA Industry). Subsequently, they will not be featured in the final specification of the regression.

### 3.8 Model Specification

The final fully-specified Hedonic Pricing model used in this thesis will take the following form; subject to minor alteration as per required:

$$P = \alpha_0 + \beta_1 B + \beta_2 A_1 + \dots + \beta_{19} A_{18} + \beta_{20} T_1 + \beta_{21} T_2 + \beta_{22} T_3 + \beta_{23} A_2 + \beta_{24} C + \beta_{25} H + \beta_{26} R + \beta_{27} Y_1 + \dots + \beta_{35} Y_9 + \beta_{36} D_A + \dots + \beta_{63} D_{Ab} + \varepsilon,$$

where

$\alpha_0$  = is the constant term

$P$  = natural log of transaction price of the property in Pound Sterling (£),

$B$  = number of bedrooms within the property minus the mean value

$A_{1,2,\dots,17,18}$  = Age Cohort of property in year of transaction where  $A_1$  takes the value 1 if the property is 0-10 years old and 0 if otherwise,  $A_2$  takes the value 1 if the property is 10-120 years old and 0 if otherwise, and so forth.

$T_1$  = a dummy variable which takes the value 1 if the property is an apartment/flat and 0 if otherwise

$T_2$  = a dummy variable which takes the value 1 if the property is a terraced house and 0 if otherwise

$T_3$  = a dummy variable which takes the value 1 if the property is semi-detached and 0 if otherwise

$T_4$  = a dummy variable which takes the value 1 if the property is detached and 0 if otherwise

$A_2$  = Accessibility by public transport as measured by the straight-line distance to the nearest London Underground or Docklands Light Railway transit stop open during the year of transaction.

$C$  = Crime rate per 100000 of population in the financial year of the transaction in the ward of sale,

$H$  = Number of employees in HORECA in the ward of sale (in thousands)

$R$  = Number of employees in retail businesses in the ward of sale (in thousands).

$Y_{1,2,3,4,5,6,7,8,9}$  = dummy variables representing the years 2007 to 2015.  $Y_1$  takes the value 1 if the transaction occurred in 2007 and 0 if otherwise and as follows.

$D_{A,B,\dots,AF,AB}$  = Distance Band to which a property belongs where  $D_A$  takes the value 1 if the property is within Band A (as described in **Table 3**) and 0 if otherwise and so forth.

$\varepsilon$  = the error term

In order to avoid multi-collinearity amongst the independent variables resulting from the dummy variable trap, multiple variables have been removed from the regression equation. These are:

- Property type 'Detached' - variable  $T_1$
- Year of sale '2007' - variable  $Y_1$
- Age Cohort '0-10 years' – variable  $A_1$
- Distance Bands '7500-8000 metres' – variable  $D_{AB}$

As a result of firstly its high multicollinearity with the variable HORECA and secondly its statistical insignificance as later shown in the regression output, the variable RETAIL will also be removed from the regression equation.

Subsequently, the regression will take the final form:

$$P = \alpha_0 + \beta_1 B + \beta_2 A_2 + \dots + \beta_{18} A_{18} + \beta_{19} T_2 + \beta_{20} T_3 + \beta_{21} T_4 + \beta_{22} A_2 + \beta_{23} C + \beta_{24} H + \beta_{25} Y_2 + \dots + \beta_{32} Y_9 + \beta_{33} D_A + \dots + \beta_{59} D_{AB} + \varepsilon,$$

### 3.9 Hypotheses

As stated throughout this thesis, research question II will be as follows:

*Did the regeneration of Stratford as part of the London 2012 Olympic lead to direct benefit of the community as reflected through a change in local house prices?*

In order to determine the answer to this question a set of hypotheses will be tested. All hypotheses will be tested at the 1% level ( $p=0.01$ ) of significance unless stated otherwise.

#### 3.9.1 Hypothesis 1

Hypothesis 1 states: Transaction prices for properties in proximity to the Queen Elizabeth Olympic Park will be higher than the transaction price of homes further away, ceterus paribus.

$$P = \alpha_0 + \beta_1 B + \beta_2 A_2 + \dots + \beta_{18} A_{18} + \beta_{19} T_2 + \beta_{20} T_3 + \beta_{21} T_4 + \beta_{22} A_2 + \beta_{23} C + \beta_{24} H + \beta_{25} Y_2 + \dots + \beta_{32} Y_9 + \beta_{33} D_A + \dots + \beta_{59} D_{AB} + \varepsilon,$$

Null Hypothesis -  $H_0: \beta_{33}, \beta_{34}, \dots, \beta_{59} = 0$

Alternative Hypothesis -  $H_0: \beta_{33} > \beta_{34} > \dots > \beta_{59}$

Hence, the null hypothesis,  $H_0$ , will be that  $\beta_{33}, \beta_{34}$  through to  $\beta_{59}$  are equal to zero or insignificant and distance from the Olympic Park is not a significant determinant of the transaction price of a property, ceterus paribus.

The alternative hypothesis  $H_0$ , is therefore that, in addition to their significance, the coefficient  $\beta_{33}$  will be greater than  $\beta_{34}$  which will be greater than  $\beta_{35}$  and so on until  $\beta_{59}$ . Interpreting this literally, Hypothesis 1 expects two things; firstly, that a proximity premium exists as a result of the Olympic Park and secondly it will be greater in closer proximity to the Park.

#### 3.9.2 Hypothesis 2

Hypothesis 2 states: The full opening of the Queen Elizabeth Olympic Park on April 5<sup>th</sup> 2014 will lead to an increase in house prices in the London Borough of Newham. Therefore, homes sold in the year 2014 will sell for a higher price than those sold before 2014, ceterus paribus.

$$P = \alpha_0 + \beta_1 B + \beta_2 A_2 + \dots + \beta_{18} A_{18} + \beta_{19} T_2 + \beta_{20} T_3 + \beta_{21} T_4 + \beta_{22} A_2 + \beta_{23} C + \beta_{24} H + \beta_{25} Y_2 + \dots + \beta_{32} Y_9 + \beta_{33} D_A + \dots + \beta_{59} D_{AB} + \varepsilon,$$

Null Hypothesis -  $H_0: \beta_{31} = 0$

Alternative Hypothesis -  $H_a: \beta_{31} > 0$

Hence, the null hypothesis,  $H_0$ , will be that  $\beta_{31}$ , the coefficient of the dummy variable  $Y_8$ , which takes the value 1 if a property transaction occurs in the year 2014, and 0 if otherwise, will be equal to zero and therefore a transaction year of 2014 is not a significant determinant of the transaction price of a property.

The alternative hypothesis  $H_a$ , will be that  $\beta_{31}$  is significant and positive and there is a positive effect on transaction prices resulting from the year of sale being 2014, ceterus paribus.

### 3.9.3 Hypothesis 3

Hypothesis 3 will require a modified regression equation. Distance will be implemented as a linear variable and the interaction variable  $DY_8$  variable will be calculated through the product of the variables 'Distance' and dummy variable  $Y_8$  which indicates if a property is sold in 2014.

This hypothesis states that: The Olympic-driven price premium, as inversely measured by variable 'Distance' will be stronger in the year 2014 than in other years.

$$P = \alpha_0 + \beta_1 B_1 + \beta_2 A_1 + \dots + \beta_{19} A_{18} + \beta_{20} T_1 + \beta_{21} T_2 + \beta_{22} T_3 + \beta_{23} A_4 + \beta_{24} C + \beta_{25} H + \beta_{26} R + \beta_{27} Y_1 + \dots + \beta_{35} Y_9 + \beta_{36} D + \beta_{37} DY_8 + \varepsilon,$$

Null Hypothesis –  $H_0: \beta_{34} = 0, \beta_{36} = 0, \beta_{37} = 0$

Alternative Hypothesis -  $H_a: \beta_{34} > 0, \beta_{36} < 0, \beta_{37} < 0$

Hence, the null hypothesis,  $H_0$ .will be, that distance, the transaction occurring in 2014 and the interaction effect of these variables will be insignificant and therefore the Olympic-driven price premium is not statistically significantly stronger (or in fact weaker) in the year 2014.

The alternative hypothesis,  $H_a$  is that the price premium resulting from being located closer to the Olympic park is higher for properties sold in 2014 than otherwise, ceterus paribus.

### 3.10 Results

**Table 7** presents a summary of the OLS panel regression outputs for Hypothesis 1,2 and 3. The full regression outputs can be found in **Appendix H**.

**Table 7: Summary of OLS Panel Regression outputs for Hypotheses 1, 2 & 3**

<u>VARIABLES</u>	(1) Hypotheses 1 & 2	(2) Hypothesis 3
<b>HOUSE CHARACTERISTICS</b>		
Number of Bedrooms	0.145**	0.144**
Age Cohorts	<i>Significant &amp; Negative<sup>‡</sup></i>	
Apartment	-0.395**	-113,426.703**
Terraced	-0.173**	-83,149.365**
Semi Detached	-0.069	-54,752.476*
Distance from LU/DLR station	-0.068**	-17.518**
<b>NEIGHBOURHOOD CHARACTERISTICS</b>		
Criminal Offences	-0.241**	-63.720**
Size of HORECA industry in the local ward	0.081**	28.446**
<b>YEAR EFFECTS</b>		
y8 - 2014	0.111**	0.137*
<b>OLYMPIC EFFECTS</b>		
Band A	0.210**	
Band B	0.194**	
Band C	0.147**	
Band D	0.199**	
Band E	0.229**	
Band F	0.232**	
Band G	0.202**	
Band H	0.136**	
Distance from Olympic Park		-0.041**
Interaction Effect		-0.003
<i>Constant</i>	13.031**	13.168**
Observations	4,795	4,795
R-squared	0.561	0.521

\*\* p<0.01, \* p<0.05, ‡ - All but one age cohort is negative and significant at the 1% level (Cohort 17 is insignificant).

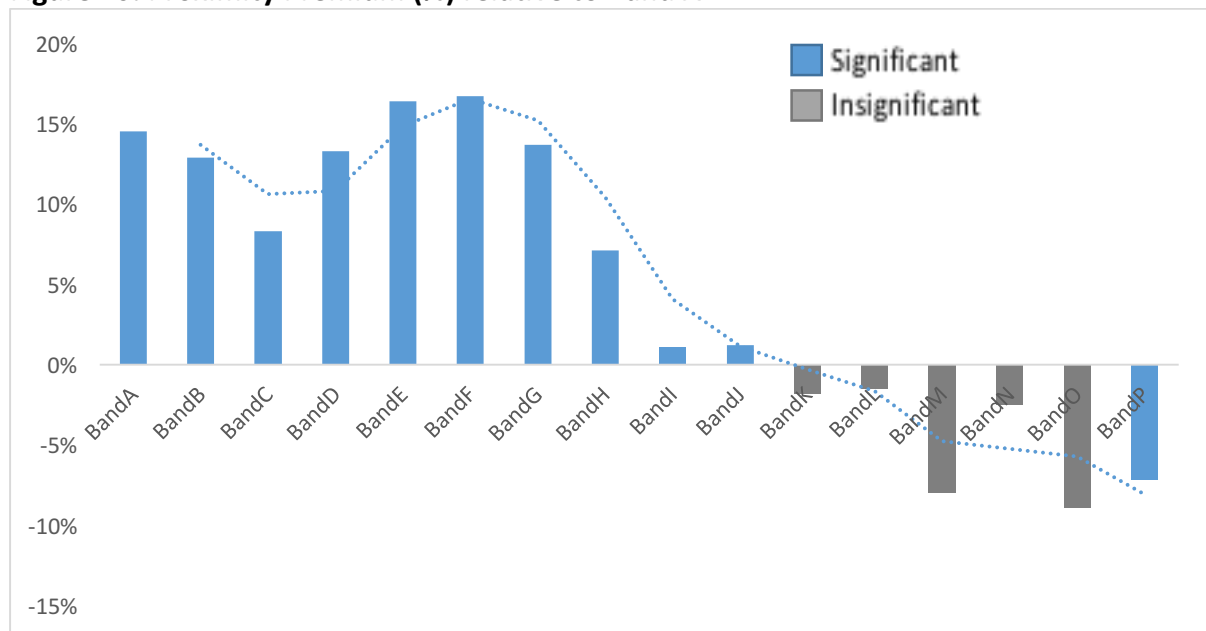
### 3.10.1 Hypothesis 1 Results

The statistical outputs of the Hypotheses regressions are shown in **Table 7**. Hypothesis 1 stated that transaction prices for homes in proximity to the Queen Elizabeth Olympic Park will be higher than the transaction price of homes further away, *ceterus paribus*

Whilst hypothesis 1 is supported by the statistical results, the mechanism by which proximity influences the transaction price of a property is not exactly as expected. What can be seen is that, to a certain distance, proximity to the centre of the Olympic Park has a positive and significant ( $p < 0.01$ ) effect on the transaction price on a property within the London Borough of Newham. This is shown through the positive value of coefficients  $\beta_{33}$  to  $\beta_{40}$ . (representing Distance Bands A to H) and their statistical significance. For example,  $\beta_{33}$ (Band A) = 0.145, which indicates that properties located within this band sold for 14.5% higher than those located within reference Band AB (7500-8000m). It can there for be inferred that properties located within 500 – 2500m of the centre of the Olympic Park had higher transaction prices relative to properties located 7500-8000m away, *ceterus paribus*. This indicates that there is a price premium resulting from being located geographically *closer* to the regenerated Olympic Park.

As expected in **section 3.4** this relationship between proximity and transaction prices is non-linear. **Figure 9** shows the price uplift resulting from being located in varying distance bands relative to Band AB (7500-8000m).

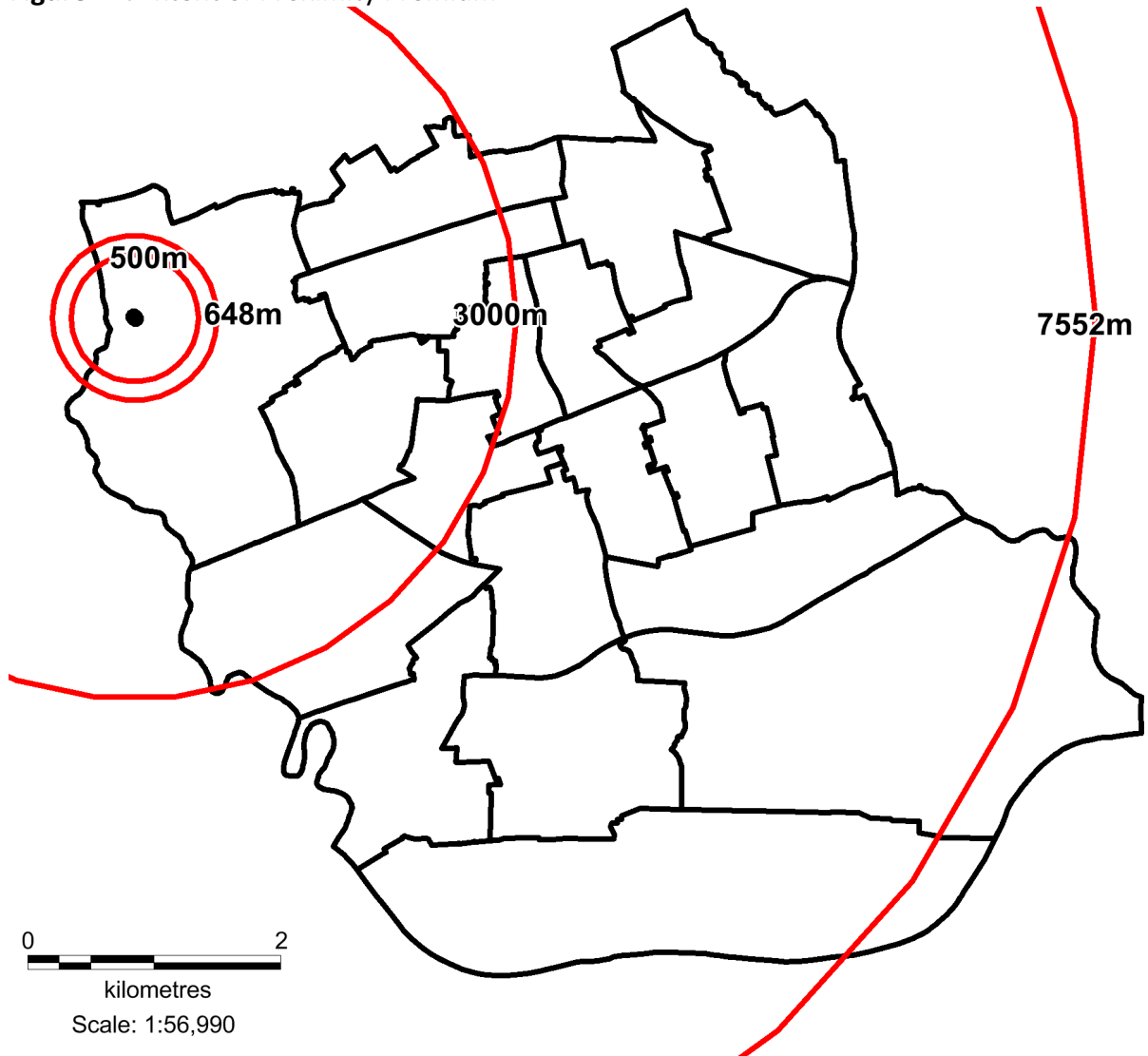
**Figure 10: Proximity Premium (%) relative to Band AB**



Further conclusion can be made from the above figure. As expected throughout this thesis, the existence of the Queen Elizabeth Olympic Park in Newham has led to higher transaction prices of properties sold within the Borough. As can be seen in **Figure 10**, whilst the proximity premium is substantial in Band A (500-1000m) from the Olympic Park, it is highest in Band F (1750-2000m) from the Park. From this point, the proximity premium decreases before consistent insignificance makes an appearance commencing with Band K (3000-3250m),

indicating a reliable end of the proximity premium. This boundary of 3000m falls in line with the work of Ahlfeldt and Maennig where the proximity premium of the Velodrom disappeared within the 2000-3000m ring. **Figure 11** shows the extent of this Olympic effect across Newham where 648m and 7552m refer to the nearest and furthest observations respectively.

**Figure 11: Extent of Proximity Premium**



It can thus be concluded that Hypothesis 1 is supported by the statistical results shown in **Table 7**.

### 3.10.2 Hypothesis 2 Results

Hypothesis 2 stated that the full opening of the Queen Elizabeth Olympic Park on April 5<sup>th</sup> 2014 will lead to an increase in house prices in the London Borough of Newham and subsequently, homes sold in the year 2014 will sell for a higher price than those sold before 2014, *ceterus paribus*.

As seen in **Table 7** Hypothesis 2 is supported by the statistical results and it is shown that transactions occurring in the year 2014 (as indicated by the dummy variable  $Y_8$ ) sold for a higher amount relative to houses sold in the appraised years before. The reference year in



this regression is 2007, and as the coefficient  $\beta_{31}$  is statistically significant ( $p < 0.01$ ) it can be interpreted as follows; houses sold in 2014, as opposed to 2007 sold for 11.1% more, ceterus paribus. Additionally, as the coefficients of variables  $Y_{3,4,5,6\&7}$  are both negative or below the coefficient value of dummy variable  $Y_8$ , and statistically significant, it can be inferred that transaction prices in 2014 were higher than in any earlier year analysed, ceterus paribus.

### 3.10.3 Hypothesis 3 Results

The statistical output of Hypothesis 3 is shown in **Table 7**. This hypothesis stated that the Olympic-driven price premium, as inversely measured by variable '*Distance*' will be stronger in the year 2014 than in other years.

As can be seen, Hypothesis 3 is not statistically supported. The coefficient  $\beta_{37}$  is statistically insignificant at both the 1% ( $p < 0.01$ ) and 5% ( $p < 0.05$ ) levels, therefore it cannot be stated that the Olympic-driven effect as measured by distance is stronger or weaker in the year 2014 as opposed to any other year.

### 3.10.4 Model Results

Whilst the hypotheses of this thesis concern the Olympic-driven effect on house prices, to assess and ensure the suitability of the model, attention will be paid to the coefficients of the additional variables. The subsequent analysis refers specifically to Model 1 (Hypotheses 1 & 2).

#### House Characteristics

The coefficient of the variable '*Bedrooms*'  $\beta_1$  is positive and significant at the 1% level ( $p < 0.01$ ). It can therefore be inferred that each additional bedroom above the mean adds 14.4% to the transaction price of the property, ceterus paribus.

The coefficient of the 17 utilised Age Cohort variables can be seen in **Appendix E**. To summarise. All 17 cohorts except for Cohort 17 (160-170 years old) are negative and significant at the 1% level ( $P < 0.010$ ). Age ranges from having a -17% to -45% impact on transaction prices, relative to the reference category of Cohort 1 (0-10 years old), all other things being equal.

The coefficient of dummy variable '*Apartment*'  $\beta_{19}$  is negative and significant at the 1% level ( $p < 0.01$ ). Thus, if a property is an apartment, as opposed to being a detached house, it will sell for 39.5% less, all other things being equal.

The coefficient of dummy variable '*Terraced*'  $\beta_{20}$  is negative and significant at the 1% level ( $p < 0.01$ ). Therefore, if a property is a terraced house, as opposed to being a detached house, it will sell for 17.3% less, all other things being equal.

The coefficient of dummy variable '*Semi-Detached*'  $\beta_{21}$  is negative and insignificant at the 5% level ( $p < 0.05$ ). Hence, nothing can be inferred regarding the effect on transaction prices of a property being semi-detached relative to its being detached, all other things being equal.

The coefficient of the variable 'Accessibility'  $\beta_{22}$  is negative and significant at the 1% level ( $p < 0.01$ ). Thus, for each additional kilometre from a London Underground or DLR station a property will sell for 6.8% less, all other things being equal.

#### Neighbourhood Level Characteristics

The coefficient of the variable 'Crime,'  $\beta_{23}$  is negative and significant at the 1% level ( $p < 0.001$ ). Therefore, for each additional recorded criminal offence categorised as either Violence against a Person or Criminal Damage per million of the ward level population, the transaction price of a property will fall by 24.1%, all other things being equal.

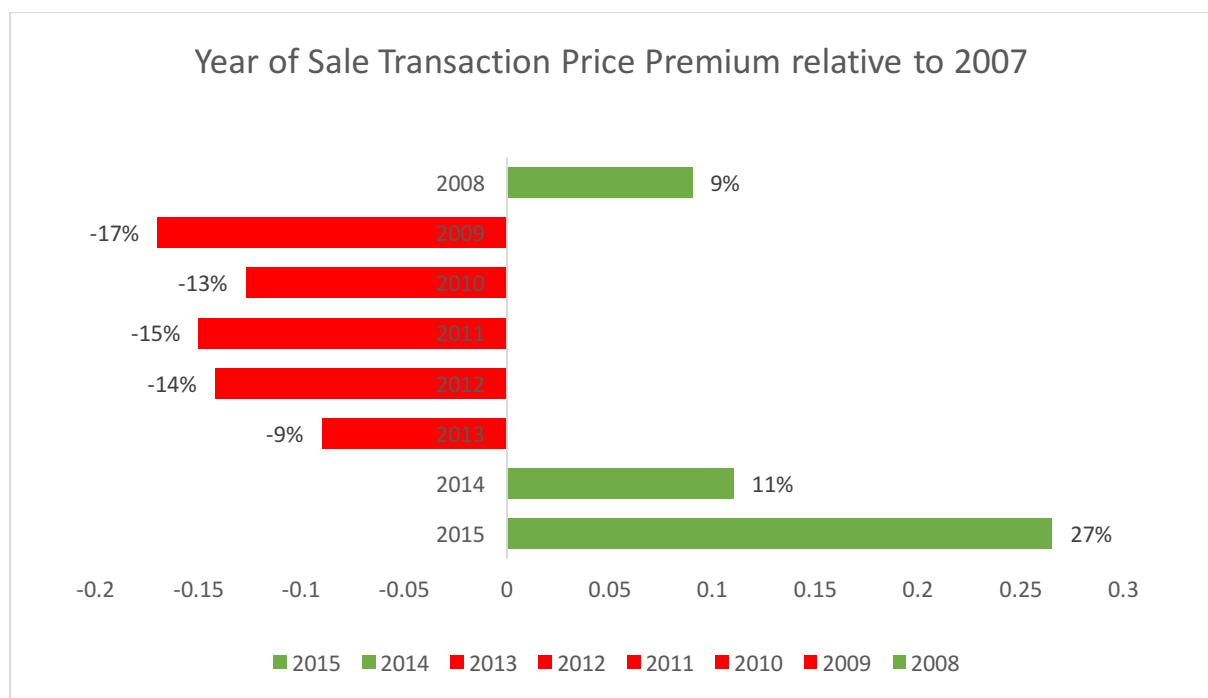
The coefficient of the variable 'HORECA',  $\beta_{24}$  is positive and significant at the 1% level ( $p < 0.001$ ). Therefore, for each additional thousand employees in the hotels, restaurant and café industry at the census ward level, the transaction price of a property will increase by 8.1%, all other things being equal.

As established earlier, the coefficient of the variable 'Retail' is not statistically significant at either the 1% ( $p < 0.01$ ) or 5% ( $p < 0.05$ ) level and therefore nothing can be inferred regarding the effect of the retail industry on house transaction prices in the London Borough of Newham.

#### Year of Sale Effects

All year variable coefficients (except for  $\beta_{25}$ ) are statistically significant at the 1% ( $p < 0.01$ ) level. As 2007 is the reference category, all coefficients refer to a percent change in transaction price in comparison to a sale occurring in 2007. For ease of interpretation they are set out in **Figure 12**.

**Figure 12:** Year of Sale Transaction Price Premium in percentages



As can be seen above, the years 2014 and 2015 see a price premium against transactions occurring in 2007, all things being equal. The opposite is true for the years 2009, 2010, 2011, 2012 and 2013.

### 3.10.5 Summary of Results

To conclude, the statistical outputs produced from Model 1 support hypotheses 1 & 2 whilst the outputs produced by Model 2 lend no statistical support to hypothesis 3. The statistical conclusions are therefore as follows.

- Firstly, there is a statistically significant and positive effect proximity effect resulting from the Queen Elizabeth Olympic Park which is consistently significant until 3km from the centre of the park. Outside this distance, statistically significant proximity effects are infrequent and therefore less empirically credible. The significant Band A-J (500 – 3000m) distance band generates an average proximity premium of 11% relative to transactions taking place in Band AB (7500-8000m), *ceterus paribus*
- Secondly, there is a statistically significant and positive effect on transaction price of having the transaction occur in the year 2014, the year of the full opening of the Olympic Park after the post-Olympics renovation to civic use. Houses sold in this year sold for 11% more than those in 2007, *ceterus paribus*
- Thirdly, there is no statistical evidence to show that the proximity premium shown in Hypothesis 1 is stronger (or weaker) in 2014.
- Lastly, the majority of utilised additional house & neighbourhood characteristics are statistically significant and display the theoretically expected sign.

## 3.11 Discussion

### 3.11.1 Key findings

The empirical analysis conducted within Section II has been centred around its oft-repeated research question: *Did the regeneration of Stratford as part of the London 2012 Olympic lead to direct benefit of the community as reflected through a change in local house prices?*

The statistical results from hypothesis 1 confirm that there is a proximity premium resulting from the Queen Elizabeth Olympic Park. How this answers research question II is as follows; the Queen Elizabeth Olympic Park was, prior to its regeneration, a “post-industrial wasteland” (Wilkinson, 2014). It was derelict, in the past an area of “noxious industries and slaughterhouses”, standing empty since the docks closed in the 1970s (Eurosport, 2012). The clean-up involved the removal of “mountains of discarded fridges and shopping trolleys from the grimy waterways”. Two million tons of contaminated soil required cleaning of petrol, oil and tar amongst other toxic substances (Eurosport, 2012). Appendix C provides a visual representation of the scale of change through aerial imagery of the Queen Elizabeth Park, taken in successive years prior and during its construction, supporting the belief that it is unlikely that it contained anything of substantial positive value to local house prices. Prior to the construction of the Olympic Park it is unlikely that properties in close proximity to what was effectively a noxious wasteland would have sold for a higher amount than properties further removed from the locality.

As a result of the Olympic-driven investment, Stratford became the second most connected part of London with two London Underground lines, a high-speed heavy-rail line and a Docklands Light Railway station. A full range 3-18 years old academy has opened in the grounds of the park alongside 2800 new homes (Dugan, 2013). The mechanism supporting hypothesis 1 is therefore as follows: given that the only change to the Park area was as a result of the Olympic-driven regeneration, the positive and significant coefficients  $\beta_{33}$  to  $\beta_{40}$ . (representing Distance Bands A to H) indicates that, the proximity premium is the result of this regeneration and therefore the regeneration of Stratford led to a positive change in local house prices.

As witnessed in **Figure 10**, the proximity premium finds its peak in Band F (1750-2000m), where transactions enjoy a 17%, *ceterus paribus*. Prior to this analysis it was previously hypothesised that the effect of distance will be greatest in closer proximity to the Olympic Park; "Impacts are positive, decrease with distance and [are] attributable to the presence of the arenas, one would intuitively expect location premium to be highest in the immediate proximity, since positive external effects should lose intensity with increasing distance (Ahlfeldt & Maennig, 2010, p. 221). This theory partly conflicts with the coefficients for the Olympic Park, the resultant coefficients pointing to the existence of negative externalities. Hence, when considering the existence of both positive and negative externalities, a more nuanced interpretation becomes apparent. Across the scope of analysis, these externalities may "cancel each other out within a certain distance range, while at other distances one externality may dominate". Clearly dominating in proximity to the park is the positive externality of large-scale urban regeneration; new community facilities, enhanced accessibility, beautified public realm. Yet, in close proximity to the park, the diminished proximity premium speaks to the increased negative externalities resulting from sports facilities; noise, increased congestion, car parking and the risk of hooliganism all at increased frequency during major events (Mason & Robins, 1991). Hence, the existence of these negative externalities may be assumed to lead to a diminished but still positive proximity premium for transactions of properties in the immediate proximity to the Olympic Park. The 'sweet spot' of Band F is therefore perfectly located to enjoy the positive externalities of the Park, yet sufficiently distant to avoid most of the negatives.

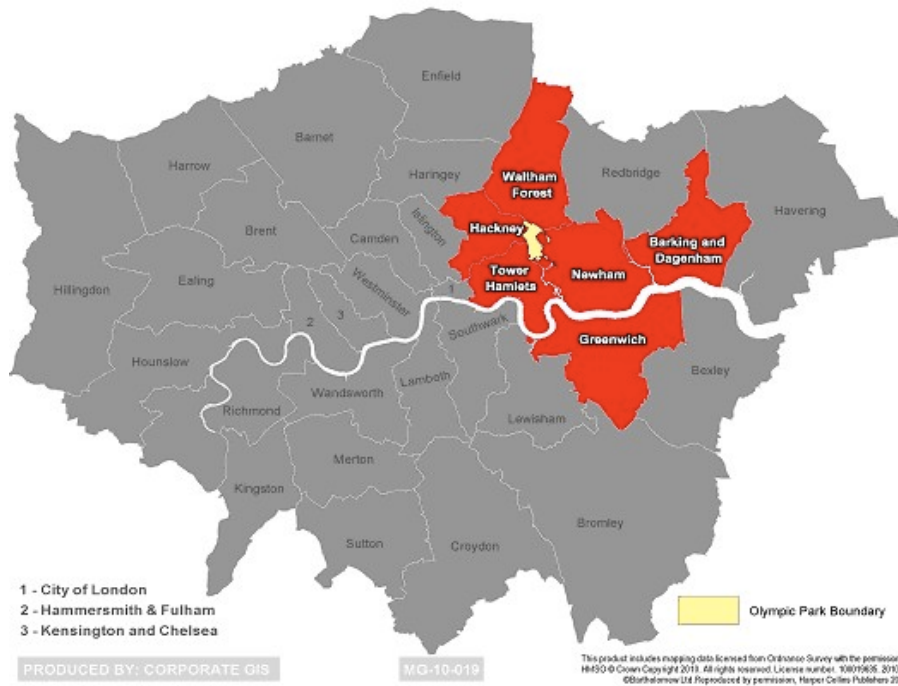
The statistical results from hypothesis 2 show that there is a price premium for houses sold within Newham in the year 2014 - the year the full park reopened after the closing ceremony of the London 2012 Olympic Games. Several conclusions can be made from the positive and significant value of the 'year of sale - 2014' coefficient and the values of those before and after it. Returning to **Figure 12**, relative to the year 2007, house transactions in 2009-2013 sold for less, all other things being equal. This indicates that there was an as yet undescribed phenomenon lowering the transaction values of homes in the London Borough of Newham in those years.

Whilst it would be simple to neatly conclude, as hypothesised, that this price increase, which coincidentally begins in the year of the full opening of the Queen Elizabeth Olympic Park, was therefore a result of the Games-driven redevelopment, there are a multitude of potential reasons which must be addressed before reaching this conclusion.

Firstly, **Figure 12** shows a decline in house transaction prices (relative to 2007) beginning in 2009 and lasting till 2013. This is concurrent with the global recession occurring at the time and therefore to support hypothesis 2 further evidence must be provided to show that the effect is driven by the Olympic Park's opening on 5<sup>th</sup> April 2014.

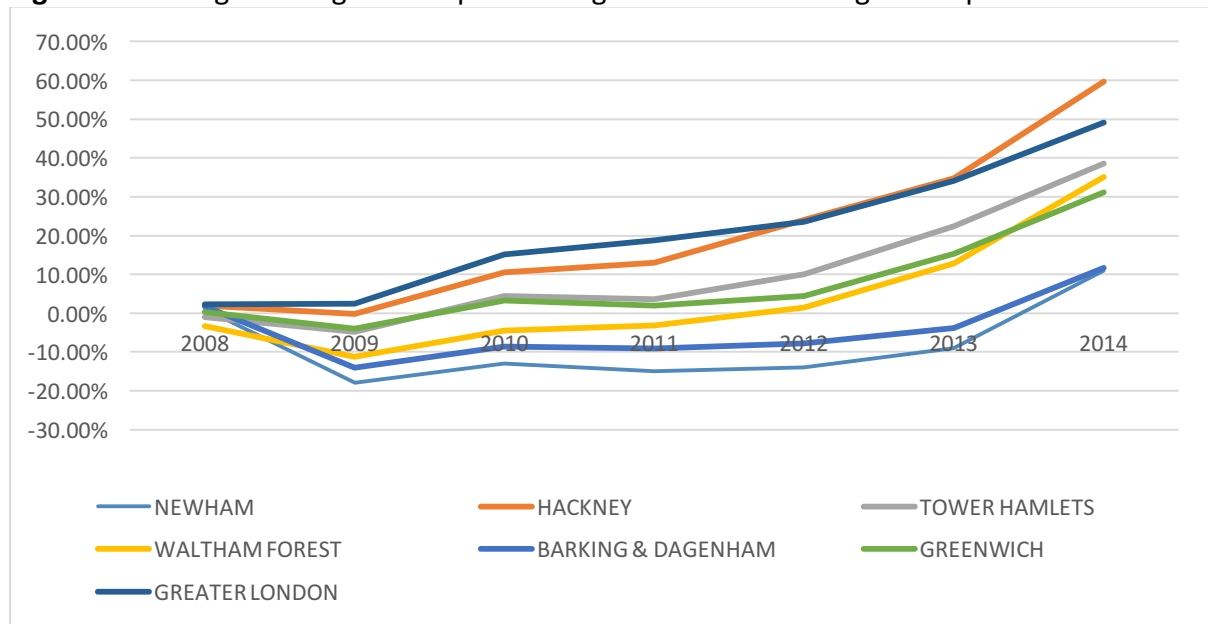
To address the potential recession driven affect, attention is turned to the growth of house prices in the five other ‘Olympic boroughs’; Hackney, Tower Hamlets, Barking & Dagenham, Greenwich and Waltham Forest. **Figure 13** shows the location of these boroughs in Greater London.

**Figure 13:** London Olympic Boroughs in Greater London



**Figure 14** shows the average ward level house price change relative to the 2007 average for the six Olympic boroughs and Greater London itself. It should be noted that the Newham growth rates are calculated from the dataset used in this thesis.

**Figure 14** Average Borough house price changes relative to average 2007 price.

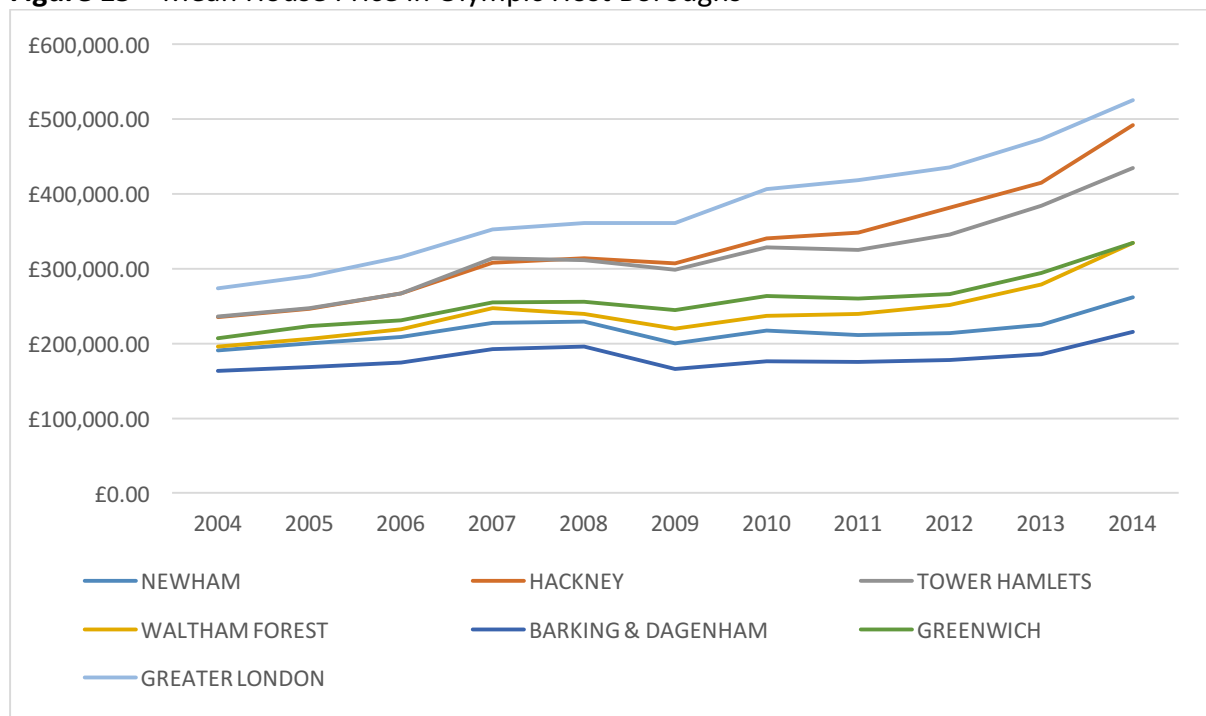


Source: London Datastore

**Figure 14** reveals many noteworthy interpretations concerning the comparative growth rates of the six Olympic host boroughs. Firstly, whilst the clear downturn of the recession is apparent in 2008/9, the Greater London growth rate remains positive throughout the assessed period. The most hard-hit boroughs are evidently Newham and Barking & Dagenham, both failing to exceed 2007 transaction prices until 2014 whilst also exhibiting the lowest average house prices throughout the assessed period as can be seen in **Figure 15**.

As is stated earlier, it would be a simple matter to consign the negative growth rates apparent in **Figure 13** to being nothing more than a by-product of a global recession and its resultant detrimental pressure on transaction prices. Despite the ease of this conclusion, a more incisive analysis uncovers additional mechanisms at play.

**Figure 15 – Mean House Price in Olympic Host Boroughs**



Source: London Datastore

Both Newham and Barking & Dagenham present the most prevalent and sustained declines in house price in comparison to the remaining Olympic boroughs, placing them in better stead to gain from a localised regeneration program such as the Olympics, yet it should not go amiss that during the Olympiad year, and despite its position as the indisputable host borough, Newham exhibited decreasing house prices to the order of 10% whilst its fellow Olympic boroughs, bar one, were on the rise. This forces an uncomfortable question; was the Olympic development, contrary to the conclusion of hypothesis 1, actually a factor behind the sustained negative growth in the host borough in excess of the others? And if so, why?

A potential explanation is the detrimental effect of what was simply a mega-event on a never-before seen scale (Poynter, Viehoff, & Li, 2015). The preparatory work for the Games resulted in a 560-acre construction site on the north-western edge of Newham along with the associated disruption to the host communities, transport and local business (Jones, Wolley, & Currie, 2015). During this construction period there were 80,000 workers on site, 420 vehicle movements in the morning peak hour and 300 movements in the evening peak

(Olympic Development Authority, 2011). With existing empirical evidence for “short-term price reductions during or immediately after the construction period” (Whitehead & Sagor, 2015), it is therefore no surprise that the resultant traffic, noise pollution and activity could have contributed to the negative impact on house prices seen until 2014. Indeed, as shown in **Figure 10** and discussed in the findings of hypothesis 1, the Queen Elizabeth Olympic Park brings with it some negative externalities. Prior to the opening of the park, local residents had all the negatives without any of the positives, lending further credence to the expected negative effect on prices prior to the Park’s opening.

Returning to hypothesis 2, the positive upswing in Newham house prices occurs in year when construction ceased and the park reopened. Given that this was also the juncture at which the *growth* in growth rates in Newham matched Greater London rate - a startling phenomenon given the consistently negative growth in the years prior – it lends credence to the conclusion that the 5<sup>th</sup> of April 2014 opening of the Olympic Park is a factor in the positive and significant  $Y_8$  coefficient.

Unlike hypotheses 1 & 2, no statistical support is provided for Hypothesis 3 which considers the magnitude of the distance coefficient in the year 2014. Interpreting the results of this hypothesis, there is no statistical evidence found amongst the dataset to claim that the proximity premium witnessed varied in magnitude during the opening year of the Olympic Park.

In conclusion, the effect on house prices resulting from the existence of the Olympic Park is not a simple, straightforward effect. Across its effective spatial scope of 3km, its potency varies, ranging from a 13% uplift to a 33% one. This, in combination with the negative price growth prior to the opening of the full park indicates that there existed a range of negative externalities, which were reduced, but not eradicated with the full reopening of the park.

### 3.11.2 Discussion

**The Reality of Legacy: Urban Transformation & the Economic Impact of the London 2012 Olympic Games** has attempted to evaluate the reality of the concept of legacy, with particular regard to the wide scale urban transformation of the East End of London. This ambition has been supported by the following research questions established in section 1.2. The initial question posed is: *what is the reality of legacy?*, which is subsequently supported by two further questions. The first asks how legacy, as *a conceptually broad, yet central tenant of the Olympics how has legacy been exhibited in past Olympic Games?* As a foundation for Section II, the case studies presented in section I communicate the dynamic evolution of the concept of legacy allowing for an improved understanding of the challenges faced by the LOCOG. There were many lessons to be learnt from past Games; how to avoid the hangover of Montreal and instead attain the astronomical financial successes of Los Angeles. How to utilise the Games as a machine for urban transformation as Barcelona did without the inequity and flagrant commercialisation of Atlanta. And how to avoid the pitfalls of Athens and ensure vitality of venues in the post-Games years. London had to achieve this with the eyes of the world upon it; would the worlds’ greatest city, faced with the deepest recession in decades, succeed? Or would it fail – its righteous ambitions, which were to regenerate its neglected, unattained? This quandary inspires the research question of section II; *was the regeneration of Stratford as part of the London 2012 Olympic led to direct benefit of the community as reflected through a change in local house prices?*

The regeneration of Stratford was long overdue; as the commercial heart of Newham, the area had been “poorer than the rest for decades” (Hill D. , 2013), the second most deprived local area in the UK (Power, 2012), and the Games were to provide the momentum for a much-needed convergence. With yardsticks measuring health, educational attainment, affluence, crime and neighbourhood-building, the assessments point to a varied, but reasonably positive outcome and hence, on paper, Newham is catching up. But whilst Newham stands transformed, was it - as is asked throughout this thesis - *‘to the direct benefit of the community’?*

Evaluating this intended outcome of the London 2012 legacy requires a return to the familiar structure of Section I; as before, official reports from the LOCOG and the Growth Boroughs Partnership has a ‘tendency to accent the positive’. The contrarian tone of many post-Olympics articles accentuates this tendency and therefore it is once again important to appraise a range of sources when assessing the London 2012 Olympics. With London, the balance of sports to non-sports legacy was at its most extreme. Of the five DCMS ambitions, only two related to a sporting legacy; to make the UK a world-leading sporting nation and to inspire a generation of young people to take part in local volunteering, cultural and physical activity. The other ambitions were to: transform the heart of East London, make the Olympic Park a blueprint for sustainable living and to demonstrate the UK is a creative, inclusive and welcoming place to live in, visit and for business (DCMS, 2007). The primary focus of this thesis has been the ambition to transform East London and discussion now turns to the question of inclusion and exclusion regarding the equity of legacy: was the proven Olympic-driven increase in house transaction prices to the direct benefit to the community?

LSE professor Ann Powers disagrees: whilst acknowledging that the scale of investment was vast and its impact undoubtedly visible, it is argued that the “big money largely bypasses the neighbourhoods where Newham residents live”. Concerningly, the regeneration schemes are claimed to have removed thousands of homes, replacing them with ‘affordable’ homes out of reach of most residents. ‘Affordable’ in UK planning terms refers to homes rented or sold at 80% of the local market rate, and is therefore a controversial term, given the super-heated nature of the London property market. ‘Affordable’, by the official definition, is therefore of little use to residents of a borough with “double the national unemployment rate” (Powers, 2012) and an average median income below £29000 (Bernstock, 2016). With ever decreasing ‘affordable housing’ targets, justified through a need to pay back debts, the housing legacy is apparently becoming less and less inclusive.

Aside from this trend, Powers’ appraisal does touch on some of the direct benefits to the community; primarily the Olympic-level local sporting facilities and the vastly enhanced accessibility, though at an increased cost over the older and slower classic services.

Also worth consideration is the mechanism through which the community would benefit from the statistically established increase in house prices. The general consensus in the mainstream media is that house prices are a barometer for the health of the economy; just as the recession saw them plummet, rising prices are heralded as a sign of progress. The distinction of who benefits is quite simply allocated on the basis of those who owns and those who does not. As one of the most socially public displays of capital wealth (Luria, 1976), home ownership allows an individual to attain an investment portfolio which, by common convention will only continue to accrue value. These individuals are the ‘winners’; as house prices rise their investment increases in value and should they choose to undergo an equity release, they stand to gain substantially.



If there are winners, there must be ‘losers’; those who rent, and first time buyers with intentions of getting on to the ‘property ladder’. As the poorest borough in London, many residents are either out of work or in low-paid employment. With almost 30% of the borough’s housing stock in social housing, near double the countrywide average of 16% (ONS, 2016), many Newham residents rent their homes and therefore an increase in house prices reduces the opportunity for homeownership amongst residents and pushes the limit on what is affordable. It can “restrict labour market mobility, raise business costs and exacerbate inequality (Carter, 2013)”. Subsequently, it can be conceded that house transaction prices are a flawed measure of ‘direct benefit to the community’, particularly within Newham.

Attention should be paid to the future of the Olympics and the legacy it creates. Whilst legacy remains a central tenant of the Olympic Charter, its perception, particularly amongst both the civic and citizen facets of a city, are changing. As the bidding process moves along for the 2024 Games, all but two bid cities have withdrawn, Paris and Los Angeles. Budapest, the last to withdraw, inspired political opposition, street protests and calls for a plebiscite referendum (Reuters, 2017). Considered an ‘unaffordable splurge’, the concept legacy has once again evolved, though this time, less to its own benefit.

### 3.12 Limitations

The central aim of this statistical study is to determine the existence and magnitude of an Olympic-effect on the transaction prices within the London Borough of Newham. Whilst, these hypotheses’ have been statistically proven, as with all academic work, there are limitations to the methods employed and the statistics undertaken. Acknowledging these limitations is not a solution in itself but it is of importance to take note of those that are likely to impact the quality of the findings. Furthermore, this acknowledgment shines a light on future paths for research which could potentially improve upon this study and the methodology herewith in.

#### 3.12.1 Dataset Limitations

First and foremost, there are limitations concerning the dataset, particularly its narrowed spatial and temporal scope. Research question II considers the direct benefit to the community resulting from the regeneration of Stratford and whilst Stratford is located within the borough of Newham, by limiting the scope of analysis to the Newham, any change to house prices outside its borders are disregarded. Hence, by omitting these changes in house price an implicit assumption is made that the ‘community’ of note to the DCMS is only that of Stratford. Whilst this is not the case, the justification for the spatial focus on Newham is as follows; as a borough it is a) the most-deprived borough of London and b) the indisputable host borough, the Olympic Park sitting right in its north-west corner. Therefore, it was anticipated that a substantial proportion of the Olympic-driven effects would occur within this locality and secondly, from a subjective societal perspective, it was the community most in need of a ‘direct benefit’.

The temporal limitation of the study was less a discretionary choice and more an unavoidable outcome of circumstances. Due to data confidentiality and disclosure regulations, Business Register and Employment Survey data is not publically available prior to 2009. Whilst ex-ante forecasting was used for 2007 and 2008, a decision was made to limit this forecasting to a two-year period due to the likelihood of its inaccuracies compounding

with each further year. By limiting the study to 2007 onwards, the initial ambition of studying the effect of the announcement of the successful Olympic bid (in 2005) was no longer feasible.

Further time-related limitations are the use of year-by-year data. By analysis change on a year-by-year basis, the ability to effectively discern the impact of a specific junctures in the Olympic development is reduced. An example is the reopening of the Olympic Park on the 5<sup>th</sup> of April 2014. Data limitations force hypothesis 2 to consider the change in prices between 2013 and 2014 as opposed to March and April 2014. Whilst this is unavoidable, it is a handicap within the model.

The neighbourhood characteristics within this model were collected at a ward-level in order to allow for greater levels of variance across the borough of Newham. By aggregating data at a ward-level individual properties are homogenised based on location. The effect, positive or negative of crime and urban amenities is unlikely to be confined by ward boundaries and is also likely to be heterogeneous across wards. Ward-levels are one of the smallest geographical levels at which UK data is collected and was therefore the 2nd best option after collecting data for each individual property.

A further limitation is the narrow set of neighbourhood characteristics utilised, particularly given the broad range of commonly used characteristics referenced in section 3.2.1. Collecting neighbourhood characteristics posed numerous challenges: the geographical scope of the analysis required highly specific data at a micro-level. Additionally, for many variables for which there were intentions of use, yearly numbers were not collected by a statistics authority. Financial and time limitations therefore reduced the wealth of data which could be used in this study and an enhanced and funded study would be better placed to expand the breadth of neighbourhood characteristics collected.

An additional limitation is that by specifically studying Newham alone, there is no means by which the resultant Olympic effect can be validated through comparison with the house price effect within further London boroughs. Whilst **Figure 14** and its accompanying discussion is a step in this direction, it is spatially limited to the Olympic host boroughs as opposed to the entirety of Greater London.

### 3.12.2 Methodology Limitations

The methodology utilised within this study presents some limitations. Firstly, the hedonic pricing model is a model based on revealed preference, and therefore it relies on consumer awareness of the costs and benefits of any attribute within the estimated regression. Whilst efforts were made to increase the likelihood of this, such as the narrowing of the definition of crime to its more visible forms, this assumption, of perfect information is immediately invalidated as a result of human nature and therefore is to the detriment of the statistical method employed.

### 3.13 Future Research

As discussed in **Section 3.12**, there are various limitations to the empirical study within this thesis, particularly regarding its narrowed temporal and spatial scope. This opens doors for future research with regards to deliberately overlooked considerations such as the potential for an anticipatory Olympic effect prior to the studied opening year of 2014. Further expansion of scope could consider a greater geographical area. Due to the location of the Olympic Park within Newham, as can be seen in **Figure 11**, it is highly likely that the theorised

proximity premium extends is visible within the unobserved boroughs north and west of Newham, both of which are adjacent to the Olympic Park.

With a  $R^2$  value above 50%, there is a strong case for the application of the empirical framework within this study to other Olympic Games. Whilst this is dependent on data availability, the utilisation of the above work will allow for a determination of the proximity premium of not just Olympic Games, but any large scale development which results in urban regeneration. Indeed, whilst the case study analysis within this thesis ends with the 2004 Athens Olympic Games, empirical study can be conducted with Beijing and soon, Rio de Janeiro. The benefits of this application are many; it would test the credibility of the empirical model. As a real estate market, London is very particular; prices growth remained positive throughout the recession, and from a size perspective, it is virtually unmatched. Hence, the replication of this work within a smaller, less dynamic market could provide some interesting outcomes.

This study has focused on transaction price of properties and consideration should be given to the rental market; with 30% of the Newham housing stock socially rented, it comprises a marked proportion of the dynamics of the Newham real estate market. Through the collection and substitution of rental prices in the place of transaction prices, this study could be replicated in order to evaluate how the Olympic regeneration has influenced this particular aspect of the market.

### 3.14 Conclusion

As a two-part exploration of the concept of legacy, 'The Reality of Legacy' aimed to chart the evolution of what is now at the heart of the Olympic movement. A qualitative chronological analysis of the legacy of five landmark Olympic Games is presented beginning with Montreal 1976 and then Los Angeles 1984, Barcelona 1992, Atlanta 1996 and Athens 2004. This analysis is framed against a repurposed set of statements as presented and pioneered by Olympic discourse academics John R Gold & Margaret M Gold. The four statements *legacy is the raison d'être for the Olympic Games yet still no city has undergone a full evaluation of legacy from an Olympic Games, there is a tendency to accent the positive, there is a changing balance of sports to non-sports legacy, the equity of legacy raises questions of inclusion and exclusion*. By utilising such a framework, a consistent, comprehensive evaluation is ensured. The central conclusion of this evaluation is that legacy is now inextricability intertwined with the modern Olympics, a trend that is likely to continue. Indeed, it is etched in to the Olympic Charter, "An important role of the IOC is to promote a positive legacy from the Olympic Games to the host cities and host countries" and with London, the LOCOG boldly stated that "...the most enduring legacy of the Olympics will be the regeneration of an entire community for the direct benefit of everyone who lives there". This thesis therefore had the ambition of answering this question through a statistical analysis of the real estate market of the London Borough of Newham. Through the use of a hedonic pricing regression on a sample of transactions between 2007 and 2015, it is established that there is a statistically proven proximity premium as a result of location in the vicinity of the Queen Elizabeth Olympic Park. Furthermore, there is statistical evidence of higher transaction prices as a result of selling in the year 2014, which is theoretically argued to be as a result of the reopening of the Olympic Park after the Games on the 5<sup>th</sup> of April 2014.

'The thread running through this thesis has been an analysis of the reality of legacy; the tangible, the intangible, the short-term, the long-term. Its malleability has been its most defining feature; the ability to wield it a multitude of ways at the whim of the organising committee. Coubertin, Drapeau, Ueberroth, Mayor Andrew Young and others looked at the Olympics and then saw past it, to an idealised vision of their city, their nation or the world; people united by sport, a racial tensions healed, lives transformed to the direct benefit of the community. In essence, it was the not strictly reality behind the allure of legacy, but fantasy. For London's then mayor, Boris Johnson, legacy would bequeath his city with "iconic buildings, major improvements in transport infrastructure, crucial housing and beautiful parks (Hart, 2008)". To the contrary, DCMS Secretary of State Tessa Jowell was more contrite; in the face of oncoming recession she remarked privately that "had we known what we know now, would we have bid for the Olympics? Almost certainly not" (Osborne & Kirkup, 2008). Whilst a private remark, the subsequent leak to the press led to further scrutiny of the ever-increasing cost of the Olympic Games. In time, Johnson was required to artfully wheel out the ever-important concept of legacy in response to the contention regarding expenditure.

Thereby, it is clear, when wielded by the right people, legacy, as part of the greatest show on earth, allows a mark to be made in a way that most could only imagine and through the Olympics, fantasy can become reality. The athletes attending the Games participate under one motto: *Citius, Altius, Fortius* and it seems this dictum has spread to the Olympic visionaries; the transfiguration is faster, their ambitions reach higher and the impact is ever-stronger.

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## Appendices

### Appendix A – Variable Description

Variable	Description	Units	Mean	Std.	Min	Max	Source
YoS	Year in which transaction took place	-	2011.596	2.752809	2007	2015	Land Registry
YoC	Year of Construction	-	1941.271	44.46208	1807	2015	
Transaction Price	Price at which property sold	GBP (£)	253281.5	91597.07	5000	1420000	
FLAT	Dummy variable indicating if the property is a flat	-	0.387	0.4870337	-	-	
TERRACE	Dummy variable indicating if the property is a terraced property	-	0.585	0.4927761	-	-	
SEMIDETACHED	Dummy variable indicating if the property is a semi-detached property	-	0.024	0.1530131	-	-	
DETACHED	Dummy variable indicating if the property is a detached property	-	0.004	0.0660401	-	-	
BEDROOMS	Number of bedrooms within the property	-	2.440	0.8839211	1	7	
RETAIL	Number of employees within the retail industry as defined in 3.3.1	No. of employees	400.908	602.9358	10	2200	BRES
HORECA	Number of employees within the HORECA industry as defined in 3.3.1	No of employees	325.213	527.0334	5	2425	
Crime	Offences per million of ward-level population	-	0.373	0.140	0.185	0.743	London Datastore
ACCESSIBILITY	Distance from nearest London Underground, London Overground or Docklands Light Railway station open during the year of sale	Kilometres (km)	803.067	402.5928	77.02597	4230.756	Own calculation using Land Registry source location
DISTANCE	Distance from the centre of the Olympic Park as defined in 3.3.1.	Metres (m)	3.648	1.568	648	7.552	

## Appendix B – Correlation Coefficient Matrix

	ACCESSIBILITY	APARTMENT	DETACHED	SEMI DETACHED	TERRA CE	CRIME	DISTANCE	HORECA	RETAIL	TRANSACTION PRICE (NATURAL LOG)	YOS	AGE	BEDROOMS
ACCESSIBILITY	1												
APARTMENT	-0.1581	1											
DETACHED HOUSE	0.0765	-0.1357	1										
SEMI DETACHED	0.0665	-0.1245	0.9175	1									
TERRACE	0.1305	-0.9426	-0.2028	-0.1861	1								
CRIME	0.159	0.1338	-0.0181	-0.0209	-0.1262	1							
DISTANCE	-0.2793	-0.1031	-0.014	-0.0058	0.1066	-0.6101	1						
HORECA	-0.1727	0.0765	-0.0411	-0.039	-0.0618	0.5494	-0.4549	1					
RETAIL	-0.0215	0.0641	-0.0135	-0.0147	-0.0588	0.6418	-0.4385	0.8256	1				
TRANSACTION PRICE (NATURAL LOG) YEAR OF SALE	-0.1138	-0.2428	0.1121	0.0912	0.2022	0.0804	-0.0965	0.1829	0.1184	1			
AGE	-0.2135	0.0088	0.0064	0.0072	-0.0108	-0.3897	0.1127	0.1763	0.0999	0.2324	1		
BEDROOMS	0.2493	-0.6715	0.062	0.0515	0.6428	-0.1833	0.0013	-0.0524	-0.0749	0.0552	0.084	1	
	0.0878	-0.5675	0.158	0.1394	0.5077	-0.1677	0.0981	-0.1285	-0.1448	0.3702	0.015	0.4021	1



## Appendix C – Distance Rings Calibrations

### Calibration 1

Distance Bands	Distance from centre of Olympic Park
Band A	500-1000
Band B	1000-2000
Band C	2000-3000
Band D	3000-4000
Band E	4000-5000
Band F	5000-6000
Band G	6000-7000

VARIABLES	(1)
Band A (omitted)	
Band B	0.203** (0.059)
Band C (omitted)	
Band D	0.005 (0.058)
Band E	0.050 (0.064)
Band F	-0.021 (0.064)
Band G	-0.079 (0.051)
Observations	4,795
R-squared	0.535

Robust standard errors in parentheses

\*\* p<0.01, \* p<0.05

### Calibration 3

Distance Bands	Distance from centre of Olympic Park
Band A	500-750
Band B	750-1000
Band C	1000-1250
Band D	1250-1500
Band E	1500-1750
Band F	1750-2000
Band G	2000-2500
Band H	2500-3000
Band I	3000-3500
Band J	3500-4000
Band K	4000-4500
Band L	4500-5000
Band M	5000-6000
Band N	6000-7000
Band O	7000-8000

VARIABLES	(3)
Band A(omitted)	
Band B	-0.109** (0.040)
Band C (omitted)	
Band D	-0.099 (0.056)
Band E	-0.061 (0.063)
Band F	-0.051 (0.067)
Band G	-0.112 (0.065)
Band H	-0.215** (0.064)
Band I	-0.245** (0.065)
Band J	-0.315** (0.064)
Band K	-0.315** (0.069)
Band L	-0.193** (0.069)
Band M	-0.300** (0.069)
Band N	-0.377** (0.067)
Band O	-0.297** (0.078)
Observations	4,795
R-squared	0.551

Robust standard errors in parentheses  
 \*\* p<0.01, \* p<0.05

## Appendix D – Year of Construction Cohorts

VARIABLES	Robustness Check
CRBEDROOMS	0.145** (0.007)
dcohort2	0.022 (0.142)
dcohort3	0.022 (0.131)
dcohort4	-0.002 (0.130)
dcohort5	-0.011 (0.131)
dcohort6	-0.014 (0.132)
dcohort7	-0.007 (0.131)
dcohort8	-0.055 (0.134)
dcohort9	-0.063 (0.131)
dcohort10	-0.110 (0.131)
dcohort11	-0.078 (0.131)
dcohort12	-0.093 (0.132)
dcohort13	0.025 (0.131)
dcohort14	0.344* (0.133)
dcohort15	0.157 (0.137)
Constant	12.843** (0.154)
Observations	4,795
R-squared	0.525

Robust standard errors in parentheses

\*\* p<0.01, \* p<0.05

## Appendix E – Age of Property Cohorts

VARIABLES	(1) Robustness Check
CRBEDROOMS	0.144** (0.007)
dcohort2	-0.186** (0.045)
dcohort3	-0.449** (0.038)
dcohort4	-0.403** (0.036)
dcohort5	-0.461** (0.034)
dcohort6	-0.466** (0.034)
dcohort7	-0.430** (0.036)
dcohort8	-0.395** (0.037)
dcohort9	-0.357** (0.035)
dcohort10	-0.368** (0.032)
dcohort11	-0.379** (0.033)
dcohort12	-0.355** (0.034)
dcohort13	-0.343** (0.033)
dcohort14	-0.307** (0.040)
dcohort15	-0.371** (0.090)
dcohort16	-0.445** (0.045)
dcohort17	-0.160 (0.113)
dcohort18	-0.358** (0.131)
Constant	13.194** (0.095)
Observations	4,795
R-squared	0.523

Robust standard errors in parentheses

\*\* p<0.01, \* p<0.05

## Appendix F – Interaction Effects

VARIABLES	(4)
Y2D	0.000 (0.000)
Y3D	-0.000 (0.000)
Y4D	-0.000 (0.000)
Y5D	-0.000 (0.000)
Y6D	-0.000 (0.000)
Y7D	-0.000 (0.000)
Y8D	-0.000 (0.000)
Y9D	-0.000 (0.000)
Constant	12.733** (0.180)
Observations	4,795
R-squared	0.524

Robust standard errors in parentheses

\*\* p<0.01, \* p<0.05

## Appendix G – Ward Dummy Variables

VARIABLES	(4)
CRBEDROOMS	0.142** (0.004)
dcohort2	-0.108** (0.030)
dcohort3	-0.337** (0.027)
dcohort4	-0.277** (0.019)
dcohort5	-0.342** (0.013)
dcohort6	-0.339** (0.014)
dcohort7	-0.327** (0.027)
dcohort8	-0.260** (0.019)
dcohort9	-0.226** (0.013)
dcohort10	-0.247** (0.022)
dcohort11	-0.252** (0.018)
dcohort12	-0.231** (0.021)
dcohort13	-0.224** (0.022)
dcohort14	-0.217** (0.036)
dcohort15	-0.301** (0.062)
dcohort16	-0.267** (0.042)
dcohort17	-0.065 (0.030)
dcohort18	-0.199 (0.116)
Apartment	-0.298** (0.048)
Terraced	-0.048 (0.050)
Semi Detached	0.020 (0.047)
Distance from LU Station	-0.005 (0.002)
Crime	0.000 (0.000)
HORECA	0.000* (0.000)
y2	-0.017** (0.005)
y3	-0.171** (0.013)
y4	-0.115** (0.020)
y5	-0.118* (0.035)

Regression with ward dummy variables (continued)

y6	-0.100*
	(0.033)
y7	-0.058
	(0.032)
y8	0.133**
	(0.025)
y9	0.273**
	(0.020)
W2	-0.048
	(0.030)
W3	-0.005
	(0.030)
W4	0.304**
	(0.035)
W5	-0.107**
	(0.013)
W6	-0.047
	(0.024)
W7	-0.007
	(0.029)
W8	-0.073*
	(0.023)
W9	0.168**
	(0.027)
W10	0.193**
	(0.031)
W11	-0.006
	(0.036)
W12	0.005
	(0.046)
W13	-0.079**
	(0.022)
W14	-0.078**
	(0.021)
W15	-0.067**
	(0.013)
W16	-0.081**
	(0.016)
W17	0.080
	(0.047)
W18	0.098
	(0.065)
W19	-0.050
	(0.032)
W20	0.153**
	(0.020)
Constant	12.687**
	(0.099)
Observations	4,795
R-squared	0.605

Robust standard errors in parentheses

\*\* p<0.01, \* p<0.05

Appendix H –OLS Panel Regression outputs for Hypotheses 1, 2 & 3

VARIABLES	(1) Hypotheses 1 & 2	(2) Hypothesis 3
<b><u>HOUSE CHARACTERISTICS</u></b>		
CRBEDROOMS	0.145** (0.008)	0.144** (0.007)
<i>AGE COHORTS</i>		
Age Cohort 2	-0.171** (0.038)	-0.187** (0.045)
Age Cohort 3	-0.399** (0.033)	-0.449** (0.038)
Age Cohort 4	-0.376** (0.030)	-0.403** (0.036)
Age Cohort 5	-0.445** (0.029)	-0.462** (0.034)
Age Cohort 6	-0.427** (0.028)	-0.466** (0.034)
Age Cohort 7	-0.389** (0.032)	-0.430** (0.036)
Age Cohort 8	-0.366** (0.033)	-0.396** (0.036)
Age Cohort 9	-0.335** (0.032)	-0.357** (0.035)
Age Cohort 10	-0.339** (0.029)	-0.368** (0.032)
Age Cohort 11	-0.357** (0.030)	-0.379** (0.033)
Age Cohort 12	-0.327** (0.031)	-0.355** (0.034)
Age Cohort 13	-0.318** (0.030)	-0.343** (0.033)
Age Cohort 14	-0.279** (0.036)	-0.307** (0.039)
Age Cohort 15	-0.365** (0.094)	-0.370** (0.091)
Age Cohort 16	-0.392** (0.037)	-0.444** (0.045)
Age Cohort 17	-0.109 (0.106)	-0.159 (0.113)
Age Cohort 18	-0.340** (0.109)	-0.359** (0.131)
<i>HOUSE TYPE</i>		
Apartment	-0.395** (0.054)	-0.379** (0.056)
Terraced	-0.173** (0.049)	-0.162** (0.053)
Semi Detached	-0.069 (0.052)	-0.066 (0.054)
accessibility	-0.068** (0.017)	-0.075** (0.022)
<b><u>NEIGHBOURHOOD CHARACTERISTICS</u></b>		
Crime	-0.241* (0.093)	-0.241* (0.093)
HORECA	0.081** (0.014)	0.081** (0.014)
<b><u>YEAR DUMMY VARIABLES</u></b>		
y2	0.010 (0.034)	0.014 (0.042)



**OLS Panel Regression outputs for Hypotheses 1, 2 & 3 (cont.)**

y3	-0.169** (0.035)	-0.160** (0.036)
y4	-0.126** (0.034)	-0.117** (0.041)
y5	-0.151** (0.030)	-0.138** (0.037)
y6	-0.142** (0.031)	-0.135** (0.037)
y7	-0.090** (0.030)	-0.087* (0.036)
y8	0.111** (0.033)	0.132* (0.062)
y9	0.265** (0.035)	0.271** (0.042)

**DISTANCE BANDS**

Band A	0.145** (0.052)
Band B	0.129** (0.044)
Band C	0.083 (0.044)
Band D	0.133** (0.036)
Band E	0.164** (0.039)
Band F	0.167** (0.035)
Band G	0.137** (0.041)
Band H	0.071 (0.043)
Band I	0.011 (0.043)
Band J	0.012 (0.043)
Band K	-0.018 (0.039)
Band L	-0.015 (0.052)
Band M	-0.081* (0.040)
Band N	-0.090* (0.039)
Band O	-0.089* (0.039)
Band P	-0.072 (0.042)
Band Q	0.092* (0.036)
Band R	-0.042 (0.035)
Band S	-0.037 (0.037)
Band T	-0.130** (0.041)
Band U	-0.073 (0.044)
Band V	-0.175** (0.054)

**OLS Panel Regression outputs for Hypotheses 1, 2 & 3 (cont.)**

Band W	-0.031 (0.052)	
Band X	-0.097 (0.055)	
Band Y	-0.159** (0.042)	
Band Z	-0.059 (0.061)	
Band AA	-0.205** (0.062)	
DISTANCE		-0.041** (0.000)
interaction		-0.032 (0.133)
Constant	3.031** (0.086)	13.189** (0.104)
Observations	4,795	4,795
R-squared	0.561	0.523

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Robust standard errors in parentheses

\*\* p<0.01, \* p<0.05

## Appendix I – Queen Elizabeth Olympic Park Aerials

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**Appendix I.1:** Aerial view of future Olympic Park in 2001



**Appendix I.2:** Aerial view of future Olympic Park in 2008



**Appendix I.3: Aerial view of future Olympic Park in 2009**



**Appendix I.4: Aerial view of future Olympic Park in 2010**

