CZECH UNIVERSITY OF LIFE SCIENCES

PRAGUE

FACULTY OF ECONOMICS AND MANAGEMENT

DEPARTMENT OF ECONOMICS

Diploma Thesis

Economic analysis of the British commercial real estate market

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Department of Economics

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DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Thesis title

Analysis of the British Commercial Real Estate Market

Objectives of thesis

The aims of this diploma thesis are:
1) To determine effects of economic indicators on the real estate market developments;
2) to conduct economic evaluation of commercial real estate market in the UK;
3) to conduct feasibility study of a in-site specific project for a commercial property in London;

Methodology

Quantitative and statistic approaches will be employed to analyse the economic position of commercial real estate market in the UK. Moreover, financial analysis will be conducted to determine costs and benefits of developer firm investing in commercial property in London. For the purposes of analyses, secondary data gathered from the UK statistical authority and from databases of CBRE will be gathered. The outcomes will be presented in forms of graphs and charts, which will be qualitatively analysed.

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The proposed extent of the thesis

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Keywords

Commercia real estate, property market, United Kingdom, London, economic analysis, real estate development

Recommended information sources

[1] Steve Berges: "The Comlete Guide to Real Estate Finance for Investment Properties: How to Analyze Any Single-Family, Multifamily or Commercial Property", Published by John Wiley & Sons, Inc., Hoboken, New Jersey, USA, 2004, ISBN: 0-471-64712-8
[2] J.Kahr and M.C.Thomsett: "Real Estate Market Valuation and Analysis", Published by John Wiley & Sons, Inc., Hoboken, New Jersey, USA, 2005, ISBN-13: 978-0-471-65526-8, ISBN-10: 0-471-65526-0
[3] Ira W. Nachem: "The Complete Guide to Financing Real Estate Developments", Published by McGraw-Hill Companies, Inc., USA, 2007, ISBN-10: 007147935X, ISBN-13: 978-0071479356
[4] CBRE Group Inc., (CB Richard Ellis), world's largest commercial real estate firm. <http://www.cbre.co.uk/uk_en>

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Last date for the submission

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Declaration

I do hereby declare that this diploma thesis named “Economic Analysis of the British Commercial Real Estate Market” is completed by myself independently and only the sources listed in the reference section were used.

Prague ……... ……

signature

Acknowledgement

I would like to express my gratitude to all those who gave me the possibility to complete this thesis. First, I am deeply indebted to my supervisor Petr Procházka, Ing, MSc, Ph.D, whose assistance, recommendations, motivation and guidance helped me in all the time of research for and writing of this thesis. I would like also to thank my family, my fiancé and my friend for encouraging, advising and taking care of me during my research.

Souhrn

Tato diplomová práce je zaměřena na ekonomické zhodnocení britského trhu komerčních nemovitostí a studie proveditelnosti rozvoje kanceláří v Londýně. Byla aplikována syntéza odborné literatury a průzkumu trhu, dále byla realizována kvantitativní analýza ukazatelů realit a studium finanční životaschopnosti projektu 20 Fenchurch Street. Na základě hospodářské analýzy, bylo vyvozeno, že Britské komerční realitní trhy se stále zotavují z recese, která začala v roce 2009. Co se týká dílčích trhů, kancelářské prostory generovali největší výnosy, vzhledem k maloobchodním nemovitostem a průmyslovým prostorům. Odpovídajícím způsobem tento sektor také nese vysoké riziko. Produkce stavebnictví ve Velké Británii klesla téměř 30 %, jakmile přišla finanční krize. Nedostatečná nabídka komerčních nemovitostí se vyvíjela se snížením dostupnosti pronajímatelné plochy. Dodavatelé i investoři jsou svázání finančními omezeními a oslabuje se tak jejich činnost na trhu s komerčními nemovitostmi ve Velké Británii. Studie proveditelnosti ukázala, vysokou potřebu kancelářských prostor v Londýně. Dále bylo zjištěno, že investice do tohoto sektoru jsou ziskové, soběstačné a proveditelné.

Klíčová slova: Velká Británii, Londýn, trh s komerčními nemovitostmi, kancelářské nemovitosti, návratnost investic, studie proveditelnosti, ekonomická analýza, bublina na realitním trhu, investiční analýza

Summary

This diploma thesis is focused on the economic evaluation of the British commercial real estate market and feasibility study of London's inner-city office development. Thereby, synthesis of specialized literature and market researches, quantitative analysis of real estate indicators and study of financial viability of 20 Fenchurch Street project were implemented. Based on economic analysis, it was deduced that British commercial real estate markets are steadily recovering from recession started in the year 2009. Regarding submarkets, office properties were generating largest returns, relative to retail properties and industrials. Correspondingly, it also bears high risks of investment in it. Construction industry in the UK shrunk its outputs by nearly 30% as financial meltdown occurred. Being unresponsive, supply of commercial property evolved decreasing availability of rentable space. Both suppliers and investors constrained by financial restrictions weakened their activities on the UK commercial property markets. The feasibility study revealed high desirability of office developments in the City of London. It was also defined that given investment is profitable, self-sustainable and feasible.

Key words: United Kingdom, London, commercial real estate market, office property, returns on investment, feasibility study, economic analysis, real estate bubble, investment analysis

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Ekonomická Analýza Britského Trhu s Komerčními Nemovitostmi

I. Introduction

The commercial real estate market had a strong position in a world economy, which was enhanced by its stable long-term growth and continuous investment inflow. The commercial property assures production, storage and sale of goods and services and provides space for work, leisure and shopping activities. Moreover, it also serves as collateral in lending institutions and as financial investment for risks reductions through portfolio diversification. [17]

The relevance of studies of the British commercial real estate markets is emphasized by the role of the market in the country's economy that cannot be underestimated for several reasons:

- The size of commercial real estate market in the UK is the second largest in Europe following German's commercial property market. [28] The value of British commercial assets' stock was £569 billion, what corresponded to nearly 33.3% of the UK governmental bonds value;[33]
- The gross value added of commercial real estate market in the UK's economy was £42 billion, what contributed 3% to the country's nominal GDP for the year 2012; [33]
- The market employed nearly 864000 persons for the same time period through the employment in commercial construction industry, commercial real estate agencies and brokerage.[33]
- Over 75% of total UK bank lending is tied to commercial assets that serve as collateral in asset-based lending. [29]
- Furthermore, the position of the British commercial real estate market is expected to strengthen. As it was reported by Office for National Statistics, the new orders of private commercial property constitute prevailing share of 35.8% in all new construction orders in the 2nd quarter 2013. [59] Moreover, forecasts for next decade suggested that the commercial real estate sector is expected to grow faster in the UK with annual growth of 2.6% comparing to other European countries. [28]
- Finally, it was declared in Investment Property Forum that the £1 decline in commercial construction industry generates a £2.09 fall in the UK National economy; [33]

Despite the fact that the UK economy is the third extensive by nominal GDP in Europe, it is very susceptible to commercial real estate bubbles in the country. [29] [71] Since the year 1956, British commercial real estate market experienced 11 boom-busts episodes with average longitude of 7.8 years. Each series have led to economic volatility in the country by affecting *stability on banking sector, the level of employment, scope of investment and business activities, construction rates and urban planning.* Moreover, commercial real estate markets' dynamics magnifies amplitudes of business cycles and, consequently, complicates and inhibits the process of economic recovery. [29] As follows, the latest economic breakdown in the UK was exacerbated by commercial property bubble and considerable amount of non-performing loans. The British economy is still struggling with the impacts of financial crises. *The movement toward full recovery is constrained by misbalance in country's commercial property market***.** [20] The current state of the commercial real estate markets across the country and their future developments are much disputed topics among economists and academicians. There is growing amount of evidential studies, which proved correlation of the commercial property markets with developments in banking sector, investment activities, business cycles and economic environment. *However, integrity of researches is limited due to insufficiency of available data and troublesome accessibility to the databases*[1]*. Furthermore, specific features of property markets, such as regional fragmentation, high transaction costs, information asymmetry, lagged supply and division to submarkets, intensify the complexity of studies.* [17] [1] Therefore, this diploma thesis will provide more insight in the British commercial real estate markets' fluctuations and its current cyclical phase. The economic analysis of the commercial property markets in the United Kingdom will examine the economic and financial environment in the country and designate macro- and micro-economic variables influencing market dynamics and behaviour. The financial analysis of commercial development project in London will contribute to understanding of market diversification, distributions of risks and returns that lead to investment decision making.

[1] The limitations of data analysis in commercial property markets were also mentioned in the work of *Haibin Zhu*: "*Real estate indicators and financial stability*", Bank for International Settlements, vol. 21, pp 9-29, 2005, ISBN:9291316784

II. Objectives and Research Questions

II.I. OBJECTIVES

The aims of diploma thesis are:

- To determine the influence of macro- and micro-economic indicators on British commercial real estate market dynamics;
- To conduct evaluation of performance (i.e. returns) and risks of retail, office and industrial property markets across the country;
- To compare developments of commercial real estate markets between UK constituent countries;
- To settle feasibility study of specific inner-city commercial real estate project in London

II.II. RESEARCH QUESTIONS

- What is the current cyclical stage of the commercial real estate markets across the UK?
- Why British commercial property markets are susceptible to bubbles?
- What are the patterns of behaviour in commercial property markets in UK constituent countries?
- Why investment into office development in the City of London is profitable?

III. Methodology

Based on scientific methods employed in the diploma thesis the specified aims will be achieved. The deductive approach will navigate entire research process in the diploma thesis. First of all, it will be formed a proper theoretical background for further investigation of research. ***The methodological and systematic review of specialized real estate literature and synthesis of academic studies and scientific articles in the field of commercial property economics will contribute in design of knowledge framework.*** These methods will define and explain:

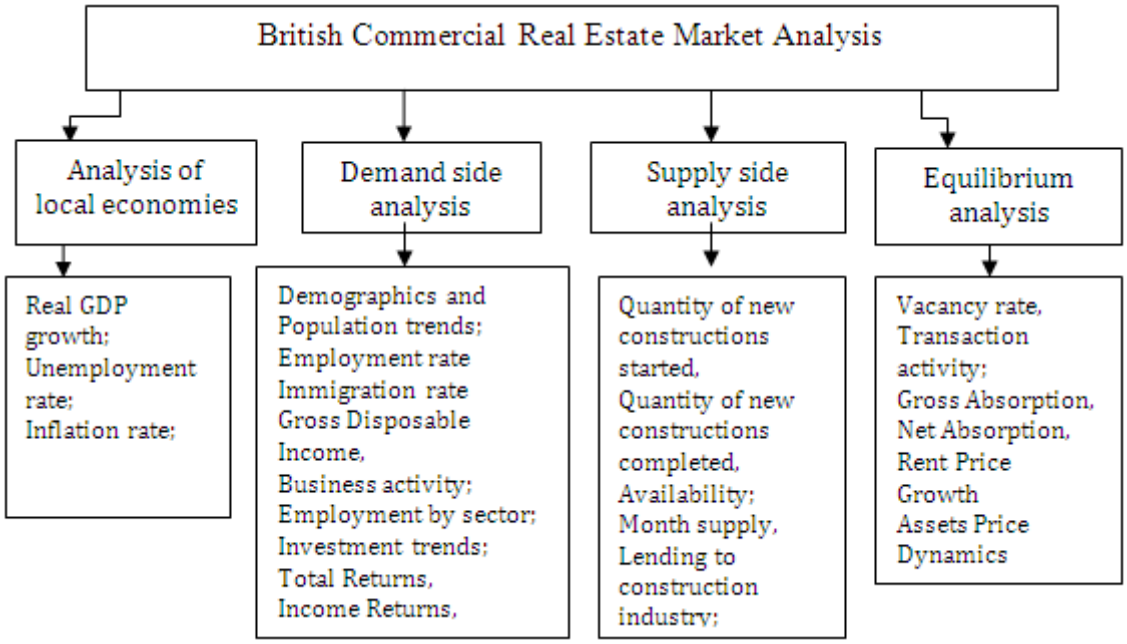
- characteristics of commercial real estate markets in the UK;
- economic, financial and political factors, which influence markets' developments;
- the correlation of British commercial property market with other sectors of economy, such as construction and banking industries;
- selected micro- and macro-economic indicators that examine and reflect markets' dynamics;
- recent trends in British and London's commercial property markets;

As the theoretical scope of the study will be established, ***secondary data from statistical offices and private databases[2] will be gathered for measurement and/or computation of relevant indicators.***

The economic analysis of commercial property market will be focused on study of aspects affecting supply and demand sides. Furthermore, this type of analysis will contribute in investigation of "cause and effect" relations among selected indicators and commercial property market. Thereby, the procedure of economic analysis is summarized in the Diagram 1. The quantitative approach and time series analysis that will be employed in the research process will enable to conduct the comparison analysis of indicators among UK constituent countries. At last, the trend analysis of commercial property prices and yields will be supplied in order to design a forecasting model.

[2] Those are databases of Investment Property Databank , CBRE, Property Data, Knight Frank, Savills and Colliers International

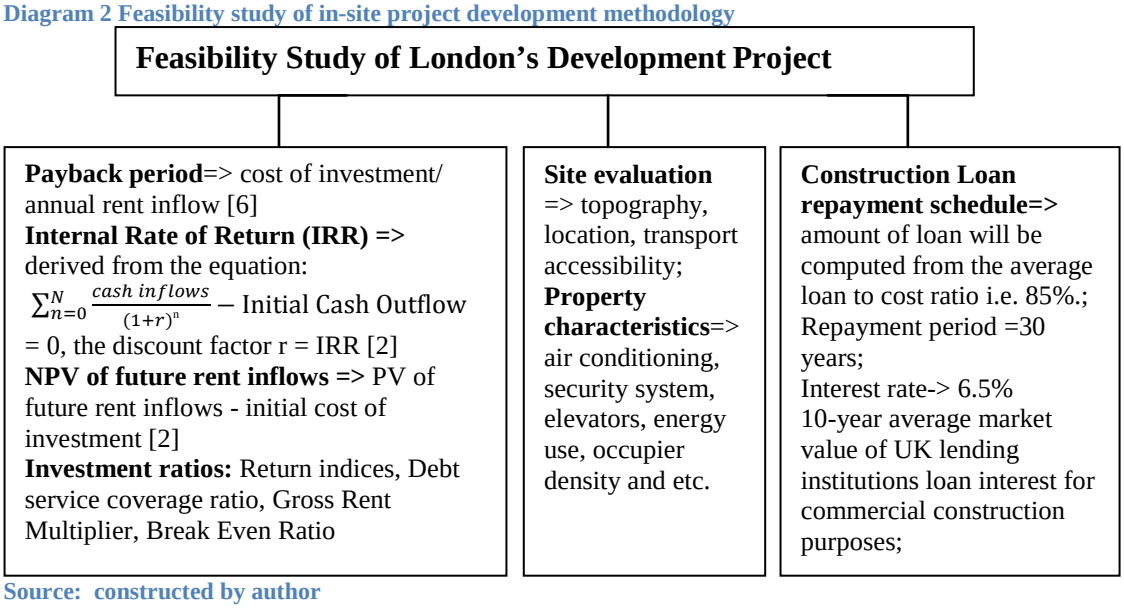
Diagram 1 British Commercial Real Estate Market Analysis Methodology



Source: constructed by author

The second part of the diploma thesis's research will be focused on feasibility analysis of the London's development project which is under construction for the period of research. The main purpose of feasibility study is to designate whether an estimated profit derived from completion of a specified project exceeds costs associated with construction and management of the building. To address the feasibility study, it was chosen a commercial "20 Fenchurch street" development project that is currently under construction. The more detailed information on feasibility analysis is provided in the Diagram 2.

Diagram 2 Feasibility study of in-site project development methodology



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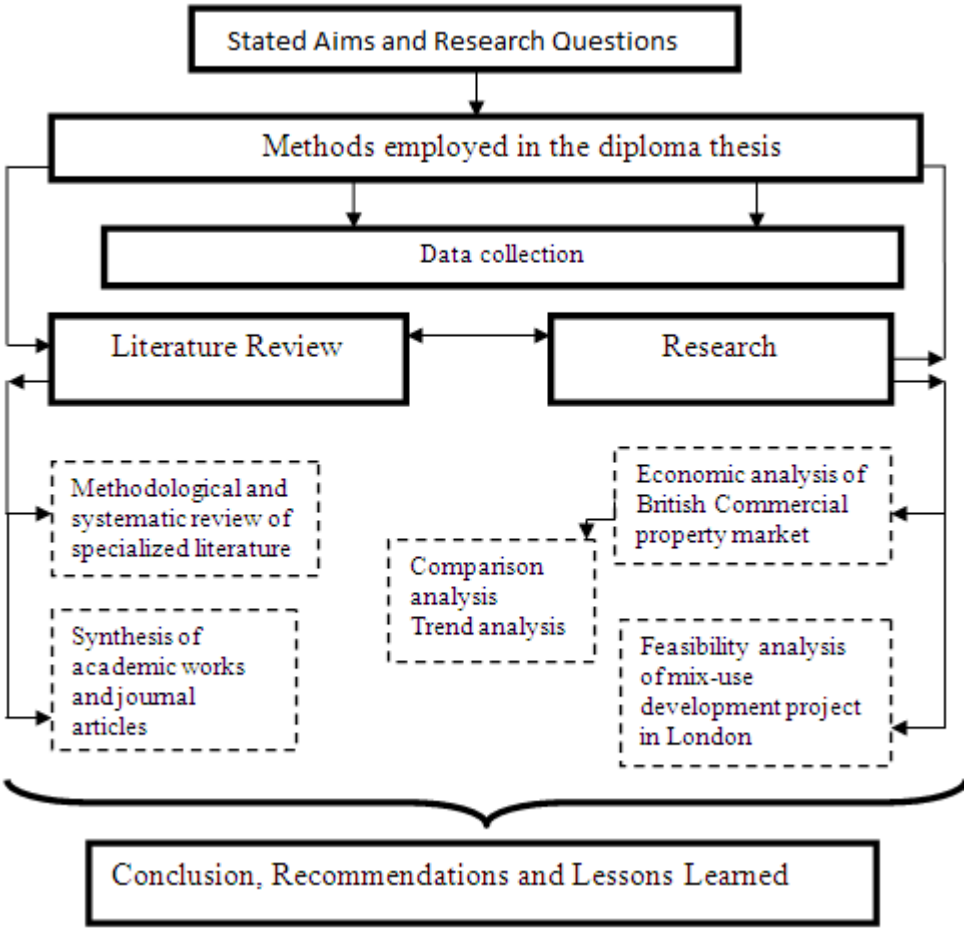
The research findings will be presented in the form of graphs, tables and histograms that will be qualitatively analysed. The analysis of British commercial property market will also designate main pitfalls that lead to market instability. Thereby, recommendations and lessons learned will be derived at the final stages of the research. The combination of methods discussed in this chapter will lead to objective conclusion, which will track back and review main findings in the thesis and evaluate the achievement of objectives. The whole methodological process is captured in the Diagram 3.

Diagram 3 Methodological process



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IV. Literature Review

IV.I. REAL ESTATE CHARACTERISTICS

Real estate market has a range of distinguishing features. Some features arise from the nature of real property reflected in its physical characteristics, while others eventuate from economic activities on real estate market. [8] [6]

IV.I.I. PHYSICAL FEATURES OF REAL PROPERTY

1) *Heterogeneity or non-homogeneity:* heterogeneous characteristics of real estate are related to the unique attributes of building units. [8] Location, design, finishing works and size are individual to each real estate. There is no substitution effect on the real property markets, thereby signifying the inelastic demand on the market. [6]
2) *Immobility* refers impossibility to move the real property and its direct dependence on the geographic position. [8]
3) *Indestructibility* primarily associated with indestructible nature of any parcel. Despite the fact that constructions are subject to physical obsolescence, land continuously persist on specified location. [8]

IV.I.II. ECONOMIC FEATURES OF REAL PROPERTY

1) *Scarcity of land*, from economic perspective, reflects that supply of land is finite in a specified location. This feature strongly correlates with local demand characteristics and its elasticity. [16]
2) *Improvements:* any improvement constructed on the lot of land influences the value and usage of both land itself and neighbouring properties. [8] [16]
3) *Permanence of investment or fixity* associates with impossibility of withdrawing inputs that were invested in the building process. Since real property is immobile, land and attachments cannot be transferred to another location. Thereby, any investments are fixed in a given location. [16]
4) *Area preference* denotes the significance of commercial real estate's location. Selection of location is key stage during development or purchase of commercial property. Location defines returns and vacancies resulting in diverse profitability of investments in given sector. Considering that demand for commercial

property is derived or industry-specific, researches at local level are crucial while selecting among alternative parcels. [8] [6]

IV.II. COMMERCIAL REAL ESTATE

Commercial properties are built with intention to generate a profit and satisfy the needs of society. [8] The European Central Bank defines commercial property as:

> *"… income-producing property, such as office buildings, restaurants, shopping centres, hotels, industrial parks, warehouses, factories and residential property owned by, for instance, a property company… Property used for residential purposes, such as multi-household dwellings, is labelled as commercial property when it is owned or developed for commercial purposes..." (ECB, "Commercial Property Markets: Financial Stability Risks, Recent Developments and EU Banks' Exposures," pp.9)*[3]

IV.II.I. COMMERCIAL REAL ESTATE MARKET SEGMENTATION

The commercial real estate market is extremely segmented due to diverse types of property usage, area preference, uniqueness and immobility of property. Investors seek for a specific commercial property types located in certain areas. While suppliers construct space for a particular purposes of use and develop it in appropriate areas. Considering that conversion of property use is relatively expensive, and, consequently, infrequent, the supply of commercial property delivers stock locally. Thereby, segmentation of both supply and demand sides of commercial property markets leads to rent and asset price variations across specified locations or property types. Individual real estate agents usually specialize on specific segment or sub-segment of commercial real estate market, whether real estate businesses arrange their operations so as to serve each segment in distinctive approach. In order to facilitate market researches and classify the commercial real estate stock, two methods of segmentation were developed. [13]

- Geographical segmentation integrates locations that possess common economic and socio-cultural characteristics. Typical instance of geographical segmentation is Metropolitan Statistical Areas (MSA). This segment encompasses metropolitan

[3] European Central Bank: "Commercial Property Markets: Financial Stability Risks, Recent Developments and EU Banks' Exposures," Frankfurt am Main, Germany, December 2008, ISBN 978-92-899-0368-4 [7]

centres and neighbouring suburban territories. MSA include smaller sub-segments, such as Central Business District (CBD) that is located in downtown. [13]

- The second method of segmentation embraces categorization of commercial real estate by its purpose of construction. [13] Commercial real estate encompasses large variety of income-producing properties that are classified according to their common characteristics and usage purposes. Specifically, office, retail, industrial and hospitality properties, multi-dwellings, commercial farms and vacant developable land enter into this segmentation. [5]

IV.II.II. TYPES OF COMMERCIAL REAL ESTATE USAGE

1) Office property is located either in business district or in suburbia. The location decision is derived from availability of qualified labour and accessibility by public and private transportation systems. Large enterprises possess personal office properties, reside and operate in it. These properties are known as "institutional property" and are maintained and managed by organization owing it. [8] The physical attributes and quality of construction are applied to distinguish among Class A, Class B or Class C of office properties. [11]

- Class A refers to the newly-build or renovated office properties that are located in district with highly developed infrastructure and communication systems. [11]
- Class B include office buildings with satisfying physical characteristics and constructed on favourable areas. This type of office properties usually have lower absorption rate compared to Class A. However, the office property associated with Class B can be referred to Class A after renovation and modernization of architectural design. [11]
- Class C represent office properties that are either obsolescent or have visible signs of deterioration. It is also differentiated by impossibility to connect advanced information and telecommunication systems and located in areas with poor infrastructure. [11]

The office buildings are commonly described as low-rise, mid-rise or high-rise. Low-rise buildings embody up to seven floors, while mid-rise office buildings towers up from 7 to 25 floors and high-rise buildings include more than 25 floors. [11]

2) Retail property refers to the wide range of commercial property that differentiates in design, location and use. Retail properties include shopping centres, outlet centres and malls that are primarily used for trading goods and services to customers. The size of retail properties and their location depend on target market and demand characteristics. [8] Primarily, two parameters are employed for classification of retail properties. The first one is the construction physical characteristics, such as shopping centre or free standing building. While the second parameter is the purpose of use of the retail property, such as grocery store, pharmacy or gourmet stores. [11]

3) Industrial properties are used for manufacturing, storing and allocation of foods. Since goods demanded are of different origin, industrial properties are of various sizes and specializations. The industrial properties incorporate heavy/light manufacturing properties, distribution and ministorage facilities and enterprise zones. [8] Industrial properties are commonly located out of town areas and clustered with supply chains, packaging and distribution facilities. [5]

- Heavy manufacturing properties are established in localities that are associated with easy access by transport, availability of specialized labour force and sufficient source of unprocessed materials. Sizable factories that are built for processing natural resources, for manufacturing machinery and equipments and refineries of raw materials refer to the heavy manufacturing properties. [8]
- Light manufacturing do not occupy spacious construction. Typical examples of light manufacturing are storehouses, assemblies and R&D facilities. [8]
- Distribution facilities or warehouses are commonly located in suburbia, and are considered as an excellent investment. Nevertheless, they are often used and owned by a single person. [8]
- Ministorage facilities are demanded by households and firms, who have insufficient space in their residence and require additional space for storing. Therefore, they are built in urban areas. [8]
- Enterprise zones are regulated by local government. There are located storehouses, fabrics of light industry and assembly plants. Since enterprise zones demand labour force, authorities award tax allowance to enterprises. [8]

4) Hospitality properties include facilities designed for entertainment, recreational purposes and resorts. Hospitality sector have seasonal fluctuations and strongly correlates with cultural and social factors, such as National celebrations, habits, events, lifestyles, and external and internal rate of tourism. Thereby, researches in the field of hospitality properties involve study of trends in mentioned factors and also include examination of possible extension, redevelopment and modification strategies of projects. [11]

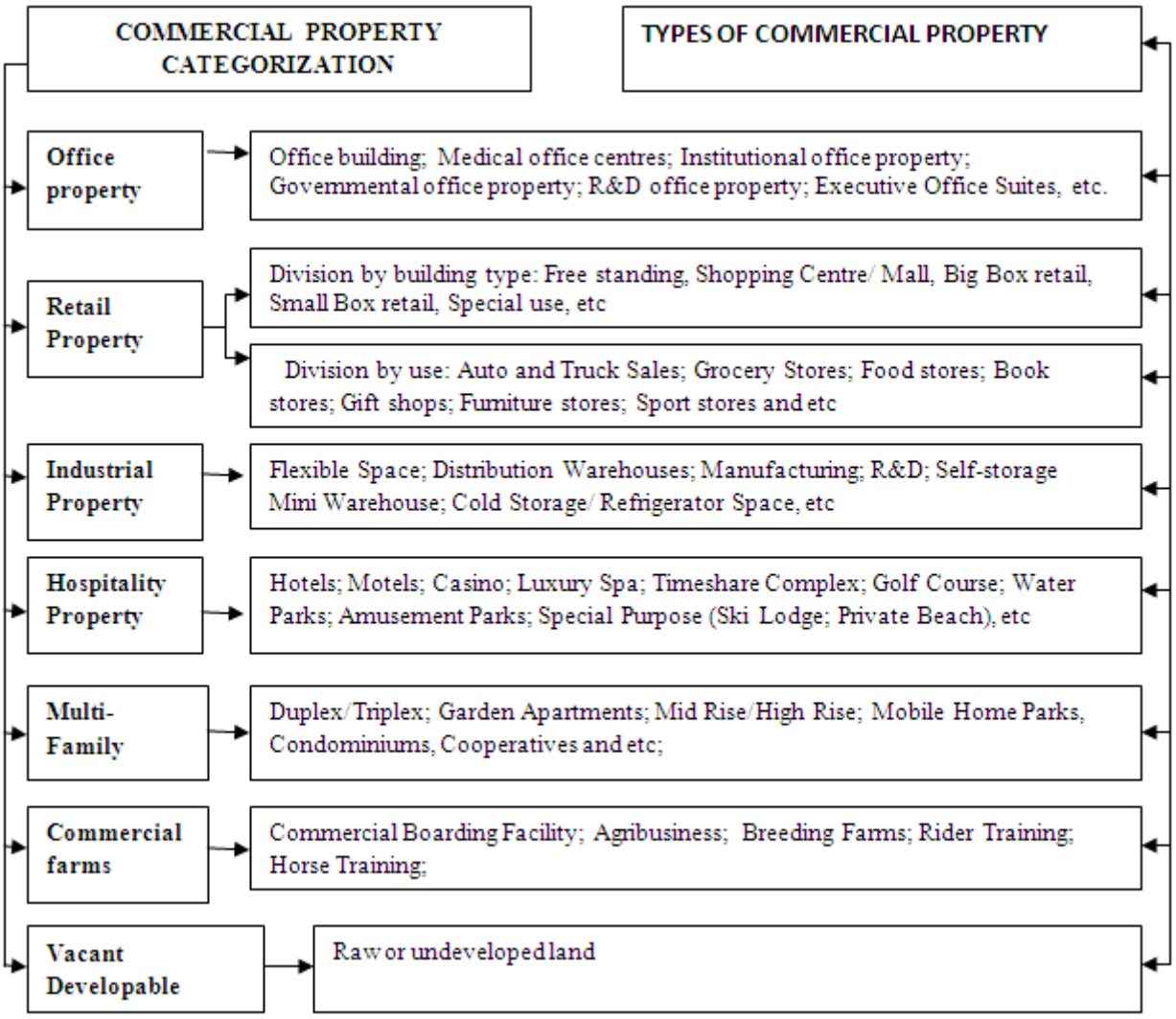
5) Multi-family dwellings designate numerous residential units that are constructed within one building. Typical examples of multi-family dwellings are block of flats consisting of multiple apartments. Multi-family dwellings that contain more than 4 housing units are treated as commercial property. [8] [11]

6) Commercial Farms category fall among commercial property as income-producing property. The construction of this type of farms is characteristically financed by lending for commercial purposes. In some instances, commercial farms owned by investors who seek for land for further commercial developments if zoning permission allows to conduct any improvements. According to Keim, commercial farms cover following farm classes:

- Breeding farms, where objective of the business is breeding and trade of livestock.
- Commercial boarding facility that provides leasable space for horses based on periodic rental charges. Provision of foodstuff for animals and care services are included in the payments. [11]
- Commercial agricultural farms or agribusiness cultivate crops for trading with retail stores. The profit-maximizing agricultural farm achieves its aims due to internal economies of scale, technological development, specialization, improving labour productivity and investments in capital. [11]
- Rider/Horse training deals with instruction and preparation of riders/horses either on vocational or non-professional level. [11]

7) Vacant Developable Land or undeveloped land is sectioned according to the zoning laws, restriction and conservation acts. Speculators, investors, developers and governments compete on the market of vacant developable land resulting in price pressures. The main premise for profitable purchase is detailed and accurate zoning research combined with feasibility and investment analyses. [11]

The commercial property market embraces numerous varieties of real estate that differ not only by physical characteristics such as size, height, construction materials and architectural design, but it is also distinguished by usage and location. [11] The figure below depicts summarization of commercial property categories and associated basic property types.



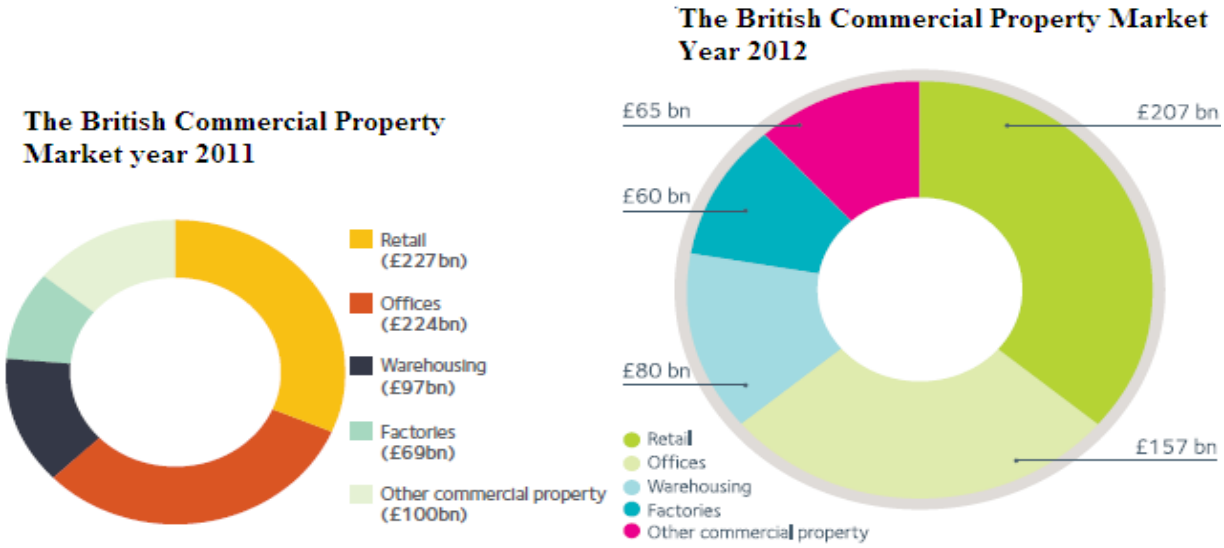
Source: constructed by author based on Keim, Loren K [11]

IV.II.III. SEGMENTATION OF THE BRITISH COMMERCIAL REAL ESTATE MARKET

According to the British Property Federation, disinvestment in the commercial property stock occurred in the year 2012, when annual estimates considerably declined by 9% from £717 billion to £569 billion. [33] [32]Due to the double-dip recession that UK economy experienced in the 2nd quarter 2012, the economic activities across

country shrunk generating disposal of assets including commercial real estates. [22] The stock value of retail sector drop by £20 billion to £207 billion, but still comprised the largest share of 36.4% in commercial property in the year 2012. Not surprisingly, the crises severely affected the office property because of substantial downturn in banking, insurance and financial sectors. The disinvestment accounted to £67 billion and the stock value reached £157 billion. The warehousing and factories encompassed for 14.05% and 10.5%, respectively, in the year 2012. The total stock value of warehousing fell by £17 billion, whereas, the corresponding figure for factories was £9 billion. At last, the total value of other commercial real estate such as hospitality sector property, multi-family properties and commercial farms declined by £35 billion and constituted £65 billion last year. [33][32]

Diagram 4 Segmentation of British Commercial Property Market



Source: Property Data Booklet [33] [32]

At the same time, the most attractive British retail property for investments was retail warehouses and parks. Based on the Investment Property Databank, capital inflows into these segments amounted to 17% from total estimated. Considering other types of retail properties, investments to shops were 11% and to shopping centres both in-town and out-town amounted to 12% and 5%, respectively. Growth in industrial property constituted 6%, whereas hospitality property gained 2% from total investments. London, as one of the largest financial centres in the world, has a continuously developing office property market that captured nearly 16% from total investments, while Central London commercial property investments reached 21%. [33]

Regarding geographical segmentation, the highest concentration of investments in office properties and shops is observed in London, specifically the City and West End districts. Central London's office capital inflow amounted to 17% from country's aggregate values, whereas shops incorporated 4%. The second largest investment bulk in shops and offices was done in the South East of England that accumulated, respectively, for 3% and 7%. Industrial properties are primarily established in out of town zones. London and South East industrials' capital inflow represent nearly 10%, while rest UK industrials captured 6%. Most of shopping centres are allocated in in-town areas, whilst there is equal distribution of all retail properties among in-town and out of town zones. Thereby, overview of geographical dispersion emphasized importance of commercial property markets, especially for such regions as London and England South West, which possess strategic and economic advantage over other regions and cities of the UK. [33]

IV.III. GENERAL EQUILIBRIUM MODEL OF COMMERCIAL PROPERTY MARKETS FROM MICROECONOMIC PERSPECTIVE

The main concern of the microeconomics is implementation of the supply and demand model on the level of individuals, firms, households so as to distinguish the decisions of buyers and sellers and understand the price adjustment mechanism. It is crucial to understand the microeconomics of commercial property markets, since it relevant for investment analysis including the economic and feasibility studies. The commercial property market is a set of four interlinked submarkets. Those are space market, asset market, development market and land market. From the microeconomic perspective, the simultaneous study of listed four submarkets is employed for the analysis of general equilibrium on the commercial property market. This chapter is focused on short-run model, because over long-run the demand and supply schedules are relatively more elastic and, hence, responsive to the variations of market conditions. Thus, economists are mainly concerned with short-run fluctuations and behaviour in the commercial property markets. [1]

IV.III.I. SPACE MARKET

In real estate literature, the space market is also called a rental market, a rent market or a user market. The space market is a market where individuals, households or businesses demand space for production or consumption purposes at different price

levels and quantity of available stock of space. [13] A rent is a price that tenants pay for the entitlement to use the commercial property space during given time frame. [14] The interaction of supply and demand on space market determines the equilibrium value of rent for a given stock of space. [1] Therefore, it is essential to examine factors influencing the decisions of producers and consumers.

IV.III.I.I. The Study of Demand on Space Market

The demand for space is generated by tenants and owners of buildings. Firms and individuals, who occupy space they possess, account for usage expense or "imputed rent". [13] The demand for space is downward sloping indicating that higher amount of space is requested at lower rent prices. [14] However, short-run demand for space is relatively inelastic, because of several reasons. First of all, the tenants are tied to leased space by contracts, where rental period and price are predetermined. Considering the long-term leases, landlords have a right for annual adjustment of rent only by the inflation rate during a lease period. Additionally, tenants require some time to alter the production processes and relocate their production facilities. Therefore, the examination of demand for space it is necessary to incorporate the concept of "rent stickiness" emphasizing that rent price respond to changes on markets with a time-lag. [1]

Classic commercial property literature define the demand at specified time (D_t) as a function of rent (R_t), economic environment (E_t), firms' output (O_t) and occupier density or space per employee/ shopper/ service consumer (S_t).

$D_t = f(R_t, E_t, O_t, S_t)$ [14]

Since the commercial property is used as a factor of production, the demand for space is "a derived demand" meaning that it is also governed by the specific features and developments related to economic sectors in which the space is utilized. As a result, government policies and regulations, technological development, cost of financing, expectations about economic environment and business confidence influence the decisions of occupiers. [14] The effect of mentioned factors is discussed in details below.

- ***Government intervene*** in economics of commercial property market by imposing taxes, providing subsidies, implementing new legislations and regulating fiscal and monetary policies with the use of financial instruments. For instance, introduction

of Climate Change Levy in the UK lead to higher demand for energy-efficient buildings. [14]

- Nowadays, the ***technological development*** plays a significant role in development of economy. The continuously progressing Information Technologies changed the process of carrying out business activities regarding provision of goods or services, ways of communication, customer care services and number of workers. The rapid development of online marketplaces and e-businesses, easing of paperwork and service outsourcing during last decade considerably decreased the demand for space in commercial property space markets. [14]
- The ***cost of financing*** primarily refers to the interest rates charged by lending institutions. The appreciation of latter lead to lower demand for space, businesses will tend to substitute by other factors of production, such as labour, as input costs increases. [14]
- Before making decisions, every rational individual and firm considers ***the expectation of output, profits, income, price, turnover and state of economy***. Accordingly, if it is perceived that in the nearest future the market conditions are favourable, businesses will expand their production of goods and services and individuals will consume extra space resulting in the shift of demand function rightward. [14]
- The ***business confidence*** reflects the awareness of politic, economic and financial volatility in the country. Risks associated with instability on markets leads to uncertainty regarding business perspective and profitability. These tendencies cause shrink in production and leftward shift of demand curve. [14]

IV.III.I.II. The Supply Side of Space Market

Suppliers of space are represented by the owners of the commercial properties who provide space for leases or occupy it themselves. In the short-run the supply of space is perfectly inelastic or fixed due to scarcity of land, costly development of projects, long useful life of building and expensive demolitions of decrepit commercial properties, what causes time lags in construction industries. [1] Respectively, the share of new stock is nearly 1% of total stock per annum. [14] Over the long-run the supply is more elastic, because new buildings are completed over time, deprived properties are pulled down and land availability improves. [1] The shift of supply curve in space market is

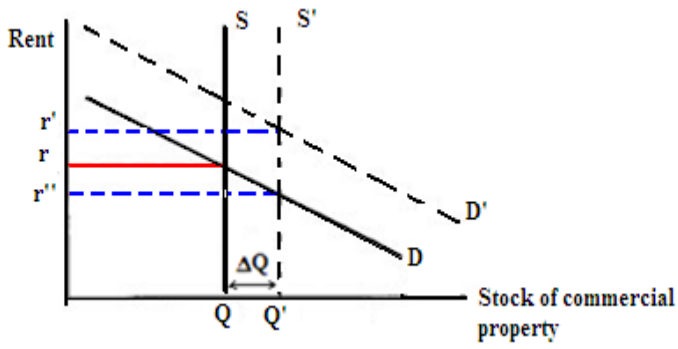
initiated by the cost of production, technology, government interventions, expectations about market conditions and changes in institutional model. The influence of some of these factors has been already argued in previous section. [14] Thereby, further discussion is concerned with the changes in institutional model and cost of production.

- Generally, ***institutional model*** examines the significance of legislative, political, financial policies and principles for the development of property markets. Financial deregulation and constraint policies, urban regeneration policies, which have been experienced by the British commercial property markets since the year 1985, had an inevitable impact on market dynamics. [14]
- ***Cost of production*** includes the cost of inputs and cost of financing. This concept is strongly related to the development market, the increase in costs will discourage developers to supply more buildings, what shifts the supply curve leftward. [14]

IV.III.I.III. Equilibrium at Space Market

The short-run model of space market is depicted on the Graph 1. Accordingly, the equilibrium rent price (r) and quantity of stock (Q) are settled by the interception of supply of (S) and demand for (D) commercial space. At this point the market is balanced: all available stock of space is absorbed, and the vacancy rate is equal to natural vacancy rate. However, the supply of space is changing over time through deterioration and demolition or newly arrived stock of commercial properties. Better credit conditions or more efficient use of construction material shifts the supply curve leftward to S'. The additions to the existing stock ($_{\Delta}$Q) reduces the rent price to r'', ceteris paribus. The role of rent is crucial in understanding the general equilibrium model of commercial property markets. [1] Thus, it was explained how market clearing mechanism is operates in space markets.

Graph 1 Short-run

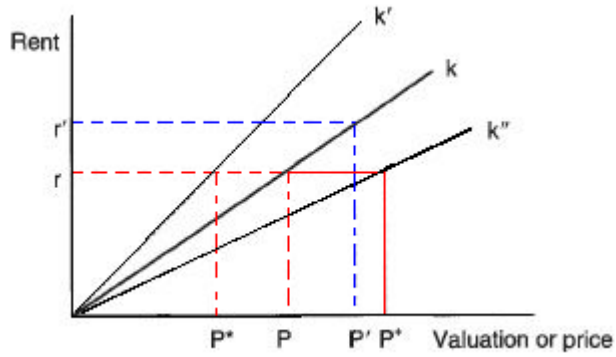


Source: adopted from [1]

IV.III.II. ASSET MARKET

Asset market or financial asset market is a market for investing in commercial property. On the demand side are investors, while on supply side are owners of the asset. The price or value of an asset is defined as market clears and quantity supplied is equalized to quantity demanded. In order to make decisions, investors take into account ***cap rate or capitalization rate***. That is simply, returns on investment and is a ration between net operating income and initial cost of investment. Thereby, the ***value of an asset*** is measured as net present value of rental income divided by cap rate that is $P=\frac{NPV future\ rent\ flow}{cap\ rate}$. The link connecting space market and asset market is derived from specified formula. For the purpose of computing price of asset, the cap rate is determined with the use of valuation methods that incorporates opportunity cost of investment, growth expectations and risks. [13]

Graph 2 Correlation of rent and asset price



Source: adopted from [1]

The Graph 2 represents the correlation of rent and asset price. The depicted curve is a future rental stream at cap rate – k. [1]

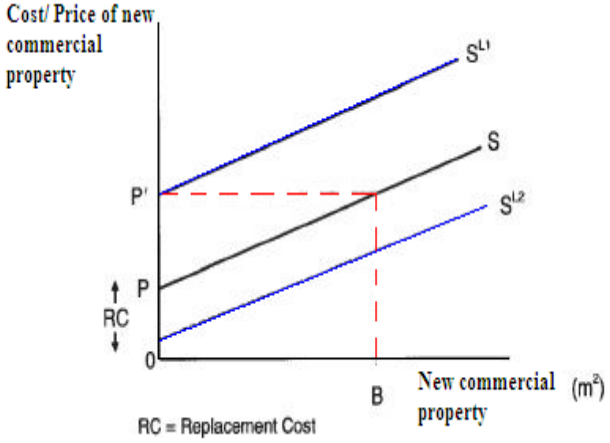
At the rent r, which is equilibrium value in space market, the price of an asset is equal to P. Higher rent value results in growth of asset's price and vice versa. Considering that interest rates are negatively correlates with net present value of rental income, an increase in the former leads to the shift of curve leftward at new capitalization rate k'. Correspondingly, the price of an asset will decrease to P* at initial rent r. [1]

This chapter emphasizes the role of cash flow generated by commercial property in asset valuation. The interaction on space market determines the cash flow that capitalizes in the price of an asset.

IV.III.III. DEVELOPMENT MARKET

The development industry supplies new commercial property space on the market. The development of project is associated with high risks, banking sector and government regulations. [13] Individuals, firms, households, investors and developers themselves constitute demand for completed projects. Pursuant to Graph 3, the supply on development market is relatively elastic, because it encompasses medium to long-run period. The new development occurs, if supply of existing falls behind the demand for commercial property, and continues until the market becomes balanced. However, the developers take into account the profitability of project, which incorporated the current price of assets and replacement costs. [1]

Graph 3 Supply side of development industry



Source: adopted from [1]

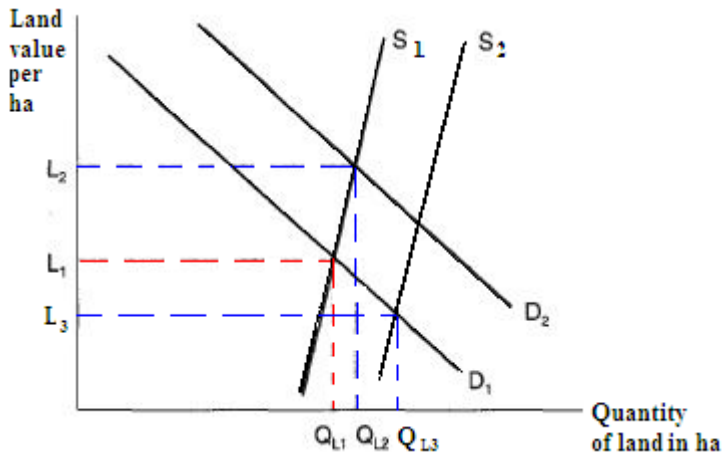
The replacement costs (RC) comprise of cost of construction, demolition, financial expenses and land purchase. If the price of commercial properties (P) exceeds the RC the developers are stimulated to supply higher quantity of commercial properties on the market. Accordingly, the supply curve traced from the point, where P=RC or equilibrium on development market. ***The development supply curve is shifted, when the cost of inputs varies***. The increase in interest rate or cost of land results in upward shift of supply curve from S to S^{L1}, ceteris paribus. Conversely, the reduction in input costs lead to downward shift from S to S^{L2}. Rent also performs as balancing factor in development market. The rent determined in space market capitalizes in the asset market to the price of commercial asset that acts as signal in development industry. If the price of assets is higher than replacement costs, developers will start to construct more buildings. Nevertheless, as new stock arrives at space market the rent decreases

and then capitalizes in lower price of assets. Consequently, both investors and developers are discouraged to participate in market activities. [1]

IV.III.IV. LAND MARKET

At this point, it is necessary to derive a link to the land market. The land is supplied for development purposes in form of auction, where commercial property developers bid prices and compete with other uses of land and among themselves. The supply schedule of land (S_1) is relatively inelastic due to scarcity of land. The urban planning and governmental regulations directly influences the quantity of land. Increased financing of infrastructure and liberalized regulations about planning permissions shifts the supply curve leftward from S_1 to S_2 indicating that new amount of land Q_{L3} is available at lower prices L_3, ceteris paribus. The demand for land is downward sloping due to substitution effect among factors of production and, herein, reflecting that more land is preferred at lower prices and vice versa. Growth in demand is originated by the pressure in development market that shifts demand curve from D_1 to D_2 resulting in land price appreciation from initial equilibrium L_1 to L_2, ceteris paribus. [1]

Graph 4 Demand and supply interaction on land market



Source: adopted from [1]

Before bidding process, landlords measure the possibility that their lot will be redeveloped by settling the value of land, which is based on the concept of "hope value" or expected value. The formula for computation is as follows: $\boldsymbol{H\ (L_p) = \frac{M}{N}(L2 - L1)}$, where hope value H ($L_p$), $\frac{M}{N}$ is a chance of lot conversion, L2 value of land per hectare of "best use," L1 is land price per hectare of actual usage. [1]

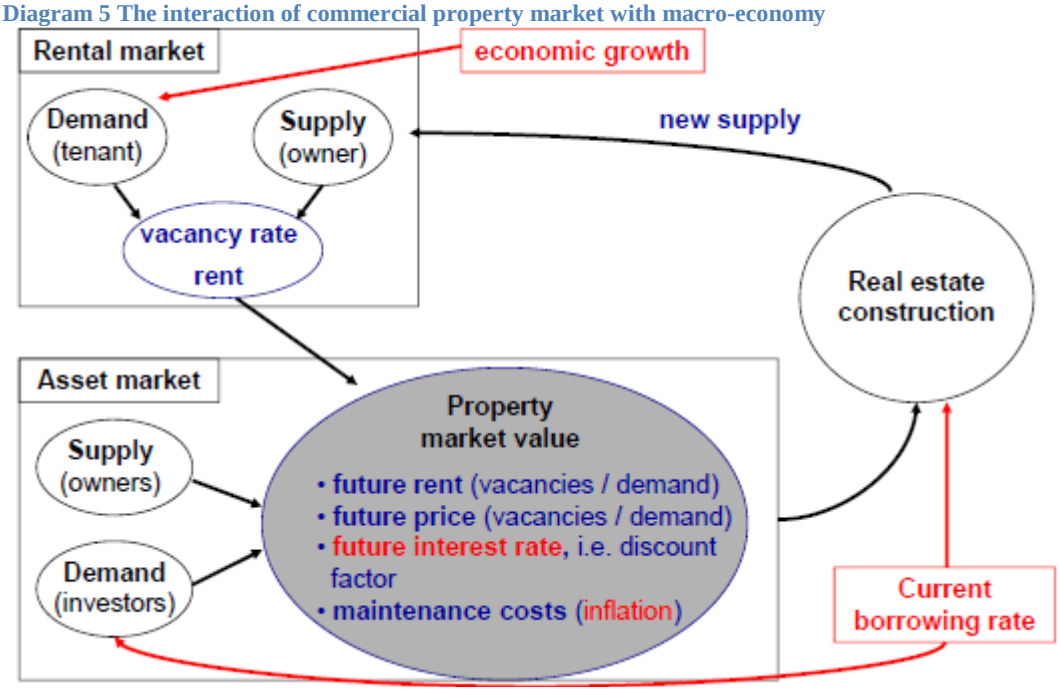
IV.III.V. SIMULTANEOUS EQUILIBRIUM IN COMMERCIAL PROPERTY SUBMARKETS

This chapter was focused on commercial property market model, which consist of four submarkets. The commercial property market is dynamic due to continuous adjustment processes persistent at all four submarkets. It was mentioned that rent price maintains equilibrium in space market, asset market and development market. The rent specified in space market capitalizes into asset prices in asset market. If asset price exceeds the replacement cost developers will supply more space. By taking into account the rent stickiness factor, the introduction of new stock will not lead to immediate rent price reduction. Developers continue to construct commercial properties until the land demand curve shifts upwards. Accordingly, the development input costs increases and no stimulus occur to provide buildings until all stock is absorbed and rent is regulated. As a result, all four submarkets reach their equilibrium and market is balanced. [14]

IV.IV. MACROECONOMIC VIEW ON COMMERCIAL REAL ESTATE MARKETS

There is strengthening concernment in researches related to interdependence of commercial property markets and macro-economy. The Diagram 1 depicts the interaction of commercial property market with macroeconomic environment and outlines factors that affect commercial real estate submarkets. Accordingly, the economic growth in country boosts the demand on rental or space market, while construction industry supplies space on market. The interaction of both determines the vacancies and rent prices that in turn influence the value of commercial properties on asset markets. Additionally, the Central Bank policies impact the prices on asset markets through manipulation of interest rates and control of inflation rate. As follows, the value of commercial properties motivates or disinclines constructors to supply more space. Whereas dynamics of construction industry and investment activities on asset market reflect regulations of lending institution that set provisions for loan approvals and, thereby, manage current borrowing rate. [1] Thereby, commercial real estate markets are strongly affected by operations on financial markets, level of business confidence and balance of macroeconomic environment. [17]

Diagram 5 The interaction of commercial property market with macro-economy



Source: Hiebert P. and Redenborg S.: "Commercial property analysis: an ECB perspective" [26]

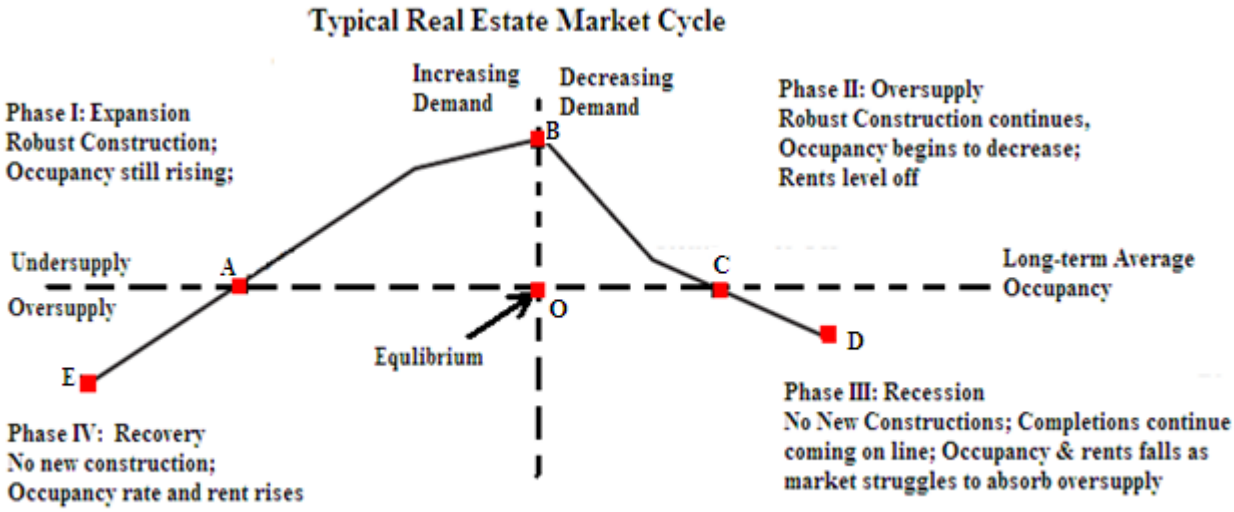
Considering that commercial property is widely used as investments, collateral and business facilities, the overall stability on goods and services markets, unemployment rates and macroeconomic environment rely on developments on commercial real estate markets. [17] [14] The economic environment in the country stimulates or discourages the demand for commercial properties, whilst investments in commercial properties generate a multiplier effect on economic growth. Inflow of capital into commercial property markets induce development and subsequent construction of projects that lead to increase in the rate of employment, stream of wages or monthly payments to employees. Accordingly, the circular flow of money originates spending and, consequently, increase demand for goods and services. As a result, the expenditures coupled with investments improve country's welfare and facilitate economic growth. [14] The interconnection of commercial property markets and macro-economy is broad topic. Basic aspects will be further explained in following chapters, though, in-detail investigation of this phenomenon is almost impossible due to complex structure of commercial property market, continuous adjustment processes on its submarkets and their correlation with other sectors of economy.

IV.IV.I. REAL ESTATE MARKET CYCLES

Real estate markets are commonly described in cyclical patterns due external economic and political environment and endogenous characteristics of real property markets

resulting in inefficiencies and susceptibility to bubbles. The Diagram 2 depicts typical real estate market cycle. The axes divide the two-dimensional system into four fields, each is described by either increasing/decreasing demand or under-/over-supply. The horizontal axis is a long-term average occupancy rate on the market. Thereafter, real estate markets undergo four stages of development. *Expansion stage* is distinguished by high level of demand for real estate that generates an upward pressure on rent and asset prices as undersupply occurs. [4] Suppliers initiate building process when inflation on property markets attains level of economically feasible developments. During this stage, from point A to B, the growth in demand for real properties exceeds supply. At the peak point B, the growth in both market forces is equal. Afterwards, demand begins to sluggish and *oversupply* combined with overpricing occurs on market. [12] Two types of oversupply on real estate markets identified: technical oversupply and economic oversupply. Technical oversupply refers to the concept, when quantity supplied of real estate exceeds the number of prospective occupants. Economic oversupply proceeds when the purchase of real estate is not affordable potential buyers or investors. [8] Therefore, it is required time to occupy the constructions output. [12]

Diagram 6 Typical Real Estate Market Cycle



Source: adopted from [12], [4]

Considering low responsiveness of supply on real estate markets, as new space is constructed, rent prices gradually decrease following rise in vacancies. Once completed projects arrive on markets, the gap between supply and demand expands leading to decline in occupancy rate. [12] Oversupply proceeds until rental charges and occupancy rate are below their long-term trend, what characterize the *recession phase.*

[4] Under recession phase, suppliers shut down construction projects and competition among them occurs. The rent price is decreased with intention to attract tenants. This situation continues until market penetrates available stock and quantity of vacant space starts decreasing. Then, the market *recovers* denoting a progressive increase in rent price and occupancy rate. [12] [4]

It is observed different behaviour of real property markets due to geographical and property usage type segmentations. Deviations of real estate markets in central business districts or metropolitan areas vary from markets in suburban areas. Moreover, retail properties and multi-dwellings are relatively less sensitive to bubbles, as opposed to office, industrial or hospitality properties. [12]

IV.IV.II. REASONS OF CYCLICAL BEHAVIOUR OF COMMERCIAL REAL ESTATE MARKETS

The cyclical nature of commercial real estate markets are explained by influences of wide range of factors that are classified as either exogenous or endogenous. Exogenous factors encompass external market forces that overspread instabilities, while endogenous factors are related to intrinsic characteristics of commercial property markets that emerge from its specific features. [17]

IV.IV.II.I. Exogenous Factors Inducing Instabilities of Commercial Real Estate Markets

1) ***Business cycles*** that economy experience has considerable impact on all investment and financial activities since it reflects the economic environment and, hence, the level of business confidence. Commercial real estate prices rise when stable growth persists in country. Whereas demand is driven by businesses, enlargement of their operations generates an upward price pressure. The risk perception also conform the state of economy. Market participants perceive investments in commercial property markets as lower risk option, whilst economy is booming. On the other hand, recession prevalently originate decline in market transactions due to unstable economy. [17] [24]
2) ***Governmental interventions*** refer to policies introduced by local, regional or any other legal institution. Since commercial property market is heavily regulated by authorities, the institutional framework has a considerable impact on market dynamics. Zoning, building permissions and taxation system either facilitate or

discourage market growth. Moreover, monetary policies, specifically, alteration in interbank interest rates and bank reserve requirements change conditions for loan approvals. Historically, liberalization policies of financial institutions generated sequence of booming episodes on commercial property markets that originated overall economic misbalance. Moreover, diminution of credit standards and unsecure loans plunge the banking sectors in highly risky position. [17]

3) ***Banking sector*** provide financing matters for investors, builders, developers and tenants in commercial property markets. Since there are high barriers in entering the market, lending institutions are major source of funding transactions. The role of banking sector in commercial property markets will be further discussed in following chapters. However, it is important to mention that banks significantly correlate with commercial property markets dynamics and have inevitable impacts on it, and vice versa. [24]
4) ***Speculation*** remains on commercial property markets due to high returns that it generates. Despite increasing risks of investing, speculators engage in transactions in order to gain profits. By taking into account that price transparency is low on commercial real estate markets, speculators apply their knowledge of markets and induce volatility of assets prices, which is associated with market inefficiencies. [11]

IV.IV.II.II. Endogenous Factors Generating Volatility of Commercial Real Estate Market

The intrinsic or endogenous characteristics of the commercial real estate market that are listed below correspond to the vulnerable and cyclical movements of it over short-run.

1) ***The supply*** in commercial real estate market is ***inelastic or fixed*** over the short-run. The reasons for low responsiveness of suppliers are high costs of development, time lags in construction and financing matters, seasonality and impracticability of demolishing. [6] In addition, supply of commercial stock tends to be regionally fragmented induced by natural conditions, area preference and legal framework. [17] The performance of governmental institutions and law effectiveness that direct land use planning and building permissions influence the velocity of construction process. Inelastic supply result in vulnerable prices on commercial property markets as demand fluctuate due to economic, demographic,

political or environmental circumstances. It is a main pitfall during economic cyclical phases that causes either rapid inflation of commercial properties when economy is booming or instabilities during recession. [6]

2) ***The effect of clustering*** in commercial property markets mirrors preferences of one area to another. Spatial concentration of industrial properties occurs due to lower transportation costs, availability of resources and required labour supply. Retailers usually cluster based on the usage of property, cultural and socio-demographic structure of locals. [13] Clustering of office property is justified by economies of scale in provision of services, image effects of office conglomerates augmenting property value, and development of transportation nodes and infrastructure. [15]

3) ***Information asymmetry*** is related to the imperfect knowledge on commercial property markets that transaction parties posses. Real estate agents behave rationally and pursue own interests. Accordingly, unfavourable information about property characteristics will not be publicized in order to eliminate likelihood of decrease in its value. Additionally, it is typical for owners to over-estimate the value of their property, while buyers are not aware of commercial property market dynamics due to insufficient study of it. [6] As information asymmetry persist on commercial property markets, price transparency is relatively low and the value is typically arranged based on bipartite negotiation process. [17] Moreover, obtaining quality information is costly and often impossible, because researches in the commercial property market are constrained due to absence of single statistical database on transaction, price, financing and investment activity. [6] [17]

4) ***"Myopic" or "rule of thumb" behaviour*** is associated with market participants' expectations about future market conditions that are solely based on either current situation or past events. Under conditions of disinformation and irresponsive supply on commercial property markets, decisions are guided by assumptions and inaccurate estimations. Thereby, such behaviour induces volatility of commercial property prices and deviations from the long-term trend. If demand for commercial properties oscillates as a result of economic expansion or favourable governmental regulations, commercial real estate market experiences supply shocks and price inflation. Accordingly, constructors start planning new projects.

Since there is time lag factor, as new building stock arrives at market, either demand might decline or economic environment worsen. As a result, oversupply occurs that drives commercial property prices downward. [17]

5) ***High transaction costs*** imply that every transfer of property ownership incorporates taxation costs, expenditures associated with analysis of local markets, brokerage and assessor fee, financial and administrational costs. Therefore, the decision to purchase or sell the property is time-consuming. [6]
6) ***Non-liquidity of commercial property*** indicates troublesome conversion of commercial real estate into some form of liquid capital without deductions in its value. [6] The lack of liquidity on commercial real estate market emanates due to several factors:
   - relatively expensive transactions; [17]
   - barriers to enter markets especially for first-time buyers or inexperienced investors; [17]
   - time-lags in administrative and financial deals; [6]
   - regional segmentation of markets resulting in nonexistence of centralized markets; [6]
   - matters relating to the legal aspects of commercial property transactions or constructions, such as zoning and land use policies; [6]
   - use of commercial property as collateral that inhibits process if debts are not repaid; [24] [6]
   - prolonged lease contracts generate rent stickiness, since both tenants and owners are constrained by clauses specified in contracts; [17]

Understanding the reasons of commercial property markets susceptibility to bubbles and its behaviour during economic cycles is essential for defining the "cause and effect" relations among economic variables and market developments.

IV.IV.III. LATEST BRITISH COMMERCIAL PROPERTY MARKET BUBBLE AND FINANCIAL MARKET

Since the collapse of dot-com bubble, the UKs' lending institutions liberalized credit constraints that improved availability of loans including lowering interest rates and reduction in bank fees, what was an accelerator of the property markets growth within the country. The favourable market conditions were also facilitated by inflation rates

that were kept at reasonably low levels, and by streaming money from overseas, such as savings originated due to the positive balance of trade in Asia. *As a result, the British commercial property market became a low risky option with a high returns that was attractive opportunity for investors*. The capital growth in the market starting from the year 2002 until its peak in the 2nd quarter 2007 was nearly 40%. [3] During the period 1996-2006, the property market became the least-risky option for investors with a risk of 4.3%, while respective figures for the UK governmental bonds were 6.9% and for equities 16.9%. [18] Correspondingly, the amount of investment inflow in British commercial property market reached £18 billion in the last quarter 2006. [3]

On the other side, mentioned tendencies generated reciprocal effects such as huge reliance of investors on financial institutions' loans and demand side pressure on the property markets creating misbalances and real estate prices appreciation. These were corresponded by declining quality of credits associated with ubiquitous approval of unsecured loans and incompetent evaluation of borrowers' credit ratings. [30] Meanwhile, adverse impacts of low-cost investments in a commercial property market were intensifying and generating property market bubble. [3]

The United Kingdom economy officially went into recession phase in last quarter 2008, following the collapse of the US financial market in the year 2007. *The rising unemployment rates, uncertain economic environment, decline in business activities and tightening conditions implemented by the UK Banks* had an inevitable effect on the commercial real estate market, which responded by a sharp reduction in the market growth. [18] The first signs of market breakdown occurred in the August 2007, when the capital growth started declining, and reached 14.9% decrease in December 2007. [3] Notably, the total returns in the submarkets were drastically reduced. In the last quarter 2008, the total returns in retail sector were nearly -14%, while in office and industrial sectors the corresponding figure reached -13% and -12% respectively. *With regard to investment activity, the weakened economy reduced the confidence of domestic and foreign investors, who started withdrawing money from the market.* [18] The number of investment transaction considerably shrank and decreased by almost 60% in the last quarter 2007, compared to the estimates a year ago, and reached £7.2 billion. At the same time, it was reported that net outflow from the UK Pooled Property Funds approached £1.2 billion. [3]

The disastrous effect of the bubble on the British economy was inevitable and country went into double-dip recession with negative GDP growth figures in second quarter of the year 2012 that worsened well-being indicators. [22] Nowadays, market steadily recovers, however, issues of uncertainty and inefficiencies in financial markets remain unresolved. [23]

This chapter discussed the reasons of the latest British commercial real estate bubble and consequences that it generated. Thereby, it is obvious that business cycles and financial markets have an ultimate impact on commercial property markets. However, resonance and magnitude of burst episodes is almost unpredictable, because of complex simultaneous external and internal influences.

IV.V. BANKING SECTOR AND COMMERCIAL PROPERTY MARKET

Banking sector is an ultimate figure in the commercial property markets. They provide funds for investments, construction and development on income-producing real estate markets. Moreover, banks engage in asset based lending where commercial properties serve as collateral. Obviously, the developments of both banking sector and commercial real estate markets are inevitably interrelate. [24] The policies and stability of banks influence the borrowing rates for investment purposes since banks are main instances where private investors can obtain credits. It was argued that commercial property bubbles forego downturns on banking sector. [17]

Credit availability measured by interest rates, loan to value ratios and creditworthiness requirements, determine the amount of funds that bank is capable to supply. A number of economic models were developed to explain linkages among commercial property markets and banking sector. [17]

- The most explicit model is “financial accelerator” mechanism claiming that growth in commercial property markets, which is associated with booming periods, improves the lending power of banks. In asset-based lending, higher prices of real estate indicate decrease in likelihood of non-performing loans. Additionally, banking sector also possess income-producing properties and earn returns on them, hence, the capital structure of banks is enhanced. [24] Correspondingly, better accessibility to funds boost demand on commercial real estate asset market resulting in subsequent rise in property prices. [17] Simultaneously, banks often pay less attention to the quality of loans approved, assessment of risks leading to

moral hazard. As bubble on commercial property markets bursts, banking sector impose restrictive policies and tightening credit conditions. Mentioned practices induce decline in demand for income-producing properties that worsens balance sheets of banks since their capital structure weakens. Recession on commercial property markets result in higher rate of non-performing loans coupled with large drop in prices of assets, altogether leading to widespread instabilities on markets and excessive risks possessed by banks. [24]

- "Disaster myopia" model refer to underestimation of both risks and probabilities of burst magnitudes. Accordingly, banks do not concern about likelihood of external shocks when economy is booming leading to reliance on debt financing structures and over-lending. Once shocks misbalance market, collapses on financial markets and real property markets generate. Thereby, it should be posit rational and scientific approaches signifying importance of market forces analysis and scrupulous study of their effects on both banking sector and commercial property markets. [24]

IV.V.I. THE ROLE OF BANKING SECTOR IN LONDON'S OFFICE PROPERTY MARKET MELTDOWN

London's commercial property markets are associated with profitability, high returns and prosperous growth despite long-term supply unresponsiveness, overpricing and consistent demand pressures. The latest bubble on London commercial property markets emerged from liberalization of financial institutions, mainly commercial banks that is the first Since London is a financial mediator, developments on office property market was the main concern of investors. London experienced downturn following sub-prime mortgage market collapsed in the US. Domino effect led its' commercial property markets in instability and weakened confidence. Banks responded to financial collapse by implementation of restrictive policies, decreased loan-to-value ratios, increased interest rates and complicated the process of loan approval. As a result, individual investors faced a constraint access to funds, while major market players such as REITs, pension funds and insurance companies were concerned with deterioration of their balance sheets and non-performing loans. Therefore, investment activities on markets were gradually declining since demand weakened. Inevitably, London office property market recorded considerable drop in transaction activity and performance indicators.

Office take-up shrunk almost three times in the end of the year 2008 compared to the average values of the preceding decade. Simultaneously meltdown proceeded in both asset markets, where values decreased by 44%, and space markets where disinflation of 35% in rent prices occurred. [3]

On the other side, foreign investors got an opportunity to enter market, because demand competition was sharply reduced, growth in prime yields was intensive and British pound depreciated. Despite risky option of investing in office properties and high cost of financing, prevailing share of transactions was conducted by foreigners as they became predominant figure on London's commercial property market. The inflow of foreign funds in office property market reached extraordinary levels resulting in 123% growth of investments in the 2nd quarter of the year 2009. Capital influx from Sovereign West Funds and Germans amounted to 73% from total value of investment activity. [3]

London's office property market already showed a positive signs in the 3rd quarter of the year 2009. Foreign investments served as accelerator in recovery process since it brought funds in capital markets and improved financial position of lending institutions. However, the main figure dictating developments on commercial property markets remained banks and other lending institutions. During the early 2000 bank policies stimulated market growth resulting in high inflation on commercial real estate markets, while tightening condition implemented in the year 2008 ubiquitously put them under pressure. [3]

IV.VI. INVESTMENTS IN THE UK COMMERCIAL REAL ESTATE MARKET

Commercial real estate market attracts investors that seek to gain high-returns, despite relatively high risk embedded in it. Majority of investors purchase commercial properties with pursue to diversify their portfolio and spread risks. [12] Particularly, the global players on the British commercial property markets are life insurance companies, pension funds, REITs, unit trusts and foreign investors that are altogether refer to institutions. [1]

- Real estate investment trusts (REITs) refer to businesses that possess commercial properties, provide financial and mortgage services. REITs enable investors to enter markets by trading stocks. There are distinguished three structures of REITs. The first one called equity REITs, which primarily own and manage income-

producing real estates. The second one is known as dubbed mortgage REITs that gain through provision of financing matters for purchase of real properties. And last structure is a hybrid REITs that encompass features of equity REITs and dubbed mortgage REITs. [9]

- Life insurance companies engage in real estate markets in the middle of XX century. Accumulation of returns from financing governments during IIWW was an initiator for investing in mortgage markets. [12]
- Pension funds entered real estate markets in the mid 1970^{s}, following life insurance companies. [12] Some pension funds operate similarly as REITs, while others mainly invest in latter institutions. [9]
- Unit trusts or mutual funds are companies, which are usually open-ended designating that shares are freely traded on stock markets. Unit trusts own and manage real estates, mortgages and securities, and transfer profits in form of dividends to shareholders. [1]
- Continuous globalization process revealed more potential horizons for foreign investors. Thus, reduction in cross-border barriers for capital flow stimulated market growth internationally and created more opportunities for investors and enabled them to operate on worldwide scale. Therefore, the growth in international transactions of commercial properties is even higher than domestic one. [19]

Altogether, the listed institutions with an exception of foreign investors hold considerable share of commercial properties and actually dominate the market. During late 1990^{s}, they owned 54% of British commercial real estate markets. Notably, insurance companies and pension funds were largest investors and controlled nearly 90% from total institutional holdings. [1] Surely, institutions operate on large-scales, because of their sources of financing, better accessibility to international market and accumulated expertise and knowledge base. [9] The UK government provided incentives for growth of insurance corporations and pension funds through introduction of obligatory insurance of certain types of private properties and compulsory registration and contributions to retirement funds that in total strengthened position of these institutions. Nevertheless, the growth in rate of foreign investments, volatility in real property markets and more stable environment on share markets discouraged investments in income-producing real estates. Regarding foreign investors, their

controlling share on UK commercial property markets was nearly 10% in 1996. However, these figure has been gradually increasing as scheme of cross-border purchase of real properties became more practical and popularized, while investors, whose domestic commercial markets are not prosperous or who wishes to diversify their investment portfolio, prefer to hold assets in politically stable and economically strong countries. [1]

IV.VII. ANALYSES EMPLOYED IN THE REAL ESTATE MARKET STUDIES

The economics of the real estate sector exploits vast amount of different types of analyses that are distinguished according to the intentions of studies, final users, decisions and issues which must be resolved. To achieve aims of the diploma thesis analyses described in this chapter will be employed. Methodology explained basic aspects of selected studies, but more detailed information is provided below.

IV.VII.I. REAL ESTATE MARKET ANALYSIS

Real estate market analysis is an extensive study that provides overview of economic environment and tendencies of market forces. [10] The basic principle of the real estate market analysis is detection and quantification of relationships among variable economic indicators reflecting supply and demand characteristics. [13] Market analysis is employed as complementary analysis for feasibility studies as well as for forecasting future trends on market. [10]

Investigation of market implies study of economic environment and examination of chosen sectors of economies. Afterwards, it is conducted more specific analysis of the real estate market encompassing studies of demand and supply sides and subsequent equilibrium analysis. [10]

The real estate market analysis incorporate indicators that are sector-specific and used only in the real estate economics, thereby, it is required further clarification. Vacancy rate, construction starts and completes, absorption rate, affordability ratios, real market rent and month supply enter this group.

- Vacancy rate reflect equilibrium on real estate markets, and it is expressed as percentage of vacant space on the market from total available stock. Natural vacancy exists on markets because of time lags in searching and transaction

processes and unresponsiveness of supply. Since space is not occupied, natural vacancy arises that is simply equal to the long-term average vacancy rate. If natural vacancy is higher than current corresponding figure the undersupply on market persist. Conversely, if current vacancy rate exceeds natural then there are either an excess supply or weakened demand on market. [13]

- Real market rent is an adjusted for inflation series of payments which are done under leasing contracts by tenants. Real rents determine whether supply and demand on market are balanced or not. [13]
- Gross absorption quantifies the annual quantity of leased space. It captures the tenants' and landlords' activities on the space market. Net absorption is another tool for estimation demand for space and reflects the shift in the space under leasing contracts. Since new supply is either leased or vacant, the formula for computation net absorption for current time period t is: (Net Absorption) $_t$ = (Vacant Space) $_{t-1}$ + (Construction Completed) $_t$ – (Vacant Space) $_t$. Net absorption is usually matched with amount of space arrived at market to detect the responsiveness of supply to the growth in demand. If net absorption is higher than amount of new stock then vacancies decreases, respectively, if construction completions exceed net absorption indicating oversupply of space, vacancies increase. [13]
- Month supply determines the rate at which vacancies will be absorbed, expressed in monthly terms, i.e. $Month\ Supply = \frac{Vacancy + Construction\ Starts}{Net\ Absorption/12}$. Accordingly, as month supply is lower than the time required for constructions, more supplies can originate since demand is not satisfied, and vice versa. [13]
- Construction starts and completed measure the supply side of the real estate markets and determines the amount of space coming on line or already supplied. [13]

Considering that demand for income-producing real estate is derived, the analysis of commercial property market also involves study of tendencies in associated sectors of economy. [13]

- Retail property analysis entail study of consumer expenditure and aggregate household wealth;
- Study of office property provide evaluation of service sector performance including financial, legal, insurance, real estate and professional services;

- Researches in industrials involve analysis of manufacturing and transportation employment, study of trade and distribution capacities;
- Hospitality property examination considers also rate of tourists, internal and external tourism and overnight stays.

Indices discussed in this chapter combined with chosen economic indicators are implemented in the practical part of the diploma thesis as they provide comprehensive information about real estate market dynamics and reflect its current position.

IV.VII.I. FEASIBILITY STUDY

The feasibility study of the given project is provided with intention to determine whether or not benefits that project will generate exceed costs associated with initial investment. It includes some aspects of both investment and market analyses that are considered as supplementary. Effective feasibility study includes several key investigations that include site evaluation, property characteristics, financing matters, risk, net present values analysis, internal rate of return and performance indicators. [10]

- Site evaluation engages in examination of topography, location, transportation accessibility and zoning; [10]
- Property characteristics examine physical attributes of the project such as occupier density, elevators, security system and etc. [10]
- Financing matters are related to the study of sources of funds and provision of loan repayment schedules. [10]
- Risk associated with development of specified project. Since construction of projects is long, many risks are inherited in it such as an unexpected events or market instabilities. If former cannot be estimated, risk associated with market instability can be predicted based on expected returns of property. Formula for risk computation is following: $Risk = \sqrt{\frac{\sum_{n=1}^{N}(TR-\overline{TR})^2}{N}}$, where N is number of years, TR is total returns on investment and $\overline{TR}$ is average total returns. [10]
- Computation of performance indicators, internal rate of return and net present values, which reflect benefits of a given project, is explained in the next chapter as they are part of investment analysis. [10]

IV.VII.II. INVESTMENT ANALYSIS

Real estate investment analysis is a study of profitability, performance and riskiness of a given property that provide a snapshot of investment potentiality. It also includes a comparison analysis among lending alternatives and conducts a loan amortization scheme by taking into account variable taxes associated with investment. [10] Experienced investors assess performance of different commercial properties and conduct comparative studies by employing measurements of ratios that reflect profitability and returns that property is capable to generate. [2] Following subchapters explain computation techniques for estimation of investment indicators, net present value and internal rate of return.

IV.VII.II.I. Basic Indicators Employed for Property Investment Analysis

- Net income return on investment (Net Income ROI) measures effectiveness of investment, specifically earnings on each pound invested in real estate. To compute this index, at first it is necessary to derive net income, which is gross operating income deducted for operating expenses, interest payments, depreciation and taxes. The principal repayment is not considered as expense and only reflected in a statement of financial position. Accordingly, $Net\ Income\ ROI = \frac{Net\ Income}{cost\ of\ investment}$. [2]
- Cash return on investment estimates the flow of cash from investment real estates. It is calculated as fraction between cash subtracted to the loan payments including interest, administration or service fees and cash investment in the real property. Accordingly $Cash\ ROI = \frac{NOI - Debt\ services}{Cash\ Investment}$, this indicator is used more often as it represents the real cash streams and ignores non-cash agents such as depreciation or amortization.
- Total return on investment (total ROI) encompasses all types of returns, with no regard of their origin of being cash or noncash. In contrast to other ROI indicators, the computation of total ROI includes loan balance and capital appreciation. The formula for computation is as follows: $Total\ ROI = \frac{Cash\ after\ debt\ service + Principal\ reduction + Capital\ Appreciation}{Initial\ investment}$, where capital appreciation is change in asset's market value.[2]

- Net operating income (NOI) amount to remaining income after deductions for operating expenses, i.e. $NOI = Gross\ Income - Operating\ expenses$. NOI expresses amount of income that can be readily used for debt coverage. This indicator is computed for further estimation of capitalization rate and for appraisal of real property. [2]
- Capitalization ratio or cap rate relates the NOI and sales value of real property, i.e. $Cap\ Rate = \frac{Net\ Operating\ Income}{Sale\ price}$. Whereas, the process of income capitalization is defined as

  > *"...the conversion a single payment or a series of payments, such as in perpetuity into a single value."(Berges S. pp.90)*[4]

  Moreover, the market cap rate is used in investment analysis for assessment of real property value and determination whether it is over- or under- priced. In real estate economics, the NOI will indicate the annual rental stream subject to required deductions. Thereby, relative cap rates reflect yields that property earns. [2]
- Debt service coverage ratio (DSCR) estimates the capability of remaining cash after payments of all operating expenses to cover liabilities. This indicator is primarily used by creditors since it indicates whether income-producing property will earn sufficient amount of cash to pay debts. DSCR is fraction of NOI to the loan payments including interest and principal. That is $DSCR = \frac{NOI}{Interest+Principal}$. The satisfying interval for credits, where DSCR value should belong, is from 1 to 1.2. [2]
- Gross Rent Multiplier (GRM) evaluates the payback rate of income-producing properties and computed as property value divided by gross income that actually equals to rental streams, specifically $GRM = \frac{Market\ Value\ of\ real\ property}{gross\ scheduled\ income}$. [2]
- Break Even Ratio (BER) reflects the performance of real property and its capability to produce cash. Particularly, the BER determine the frontier where

[4] Berges S.: "The Complete Guide for Real Estate Finance for Investment Properties: How to Analyze Any Single-Family, Multifamily or Commercial Property," Published by John Wiley & Sons, Hoboken, USA, 2004, ISBN 0-471-64712-8,

cash inflows and cash outflows equalize. To compute the BER cash outflows are related to the cash inflows, i.e. $BER = \frac{Total\ Operating\ Expenses + Debt\ service}{Gross\ Income}$. [2]

IV.VII.II.II. Net Present Value Analysis

Net present value (NPV) analysis is designed to assess the minimal projected earnings that commercial property will generate. To conduct NPV analysis, it is required to compute the present value (PV) of cash inflows or future value of property and subtract from resulting value the initial cost of investment. The PV is estimated by discounting future cash inflows either at present value interest factor or at rate of returns that convert annuities in current dollar value. The cost of investment is actual price of an asset. Thus, $NPV = PV - cost\ of\ investment$, if NPV is above zero denoting that PV is higher than cost of investment, the investment in asset is profitable as it earns higher than minimal projected rate of return. On the other hand is NPV is below zero, investment should not be done. [2]

IV.VII.II.III. Internal Rate of Return

Internal rate of return (IRR) evaluates the yields or returns that commercial property generates. The IRR captures costs associated with investments, cash inflows from income-producing properties and residual value. Considering real estate, the economic useful life is determined individually for each asset based on property management and improvement that can postpone the demolition process. The IRR is derived from following estimation of NPV, which is equal 0. Thereby formula for computation is following $\sum_{n=0}^{N} \frac{cash\ inflows}{(1+r)^n} - \text{Initial Cash Outflow} = 0$, where the IRR is a discounted interest factor r. [2]

The listed measurements are main tools for assessment of investments in the income-producing properties. It is important to mention that the single indicator or value possess limited information and do not incorporate much meaning. Hence, quality analysis requires simultaneous examination of range of indicators. Performance and efficiency indicators will be employed in this diploma thesis as a complement to feasibility study.

V. Research Findings

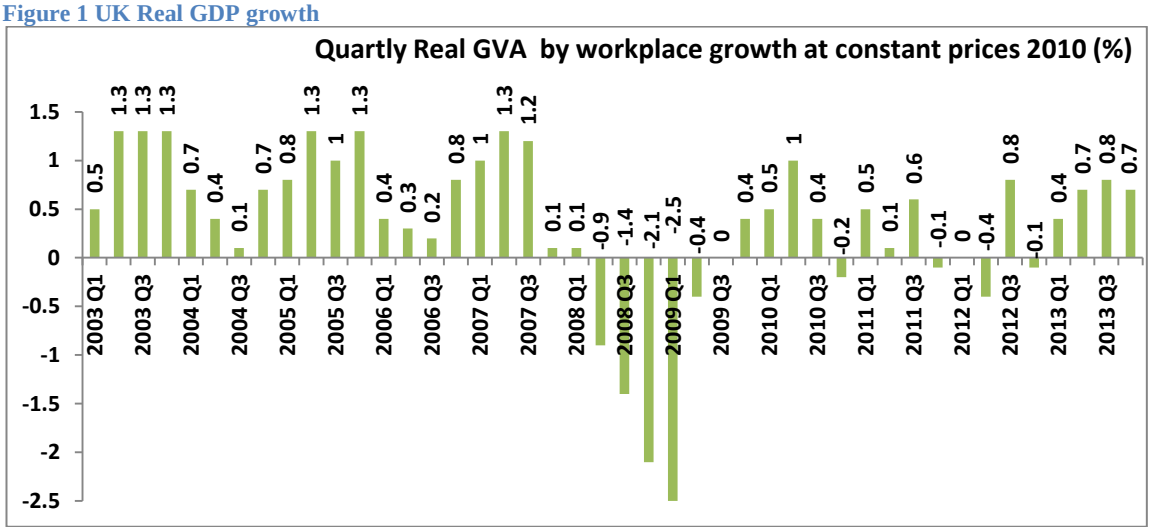
V.I. ECONOMIC ANALYSIS OF THE BRITISH COMMERCIAL REAL ESTATE MARKETS

Commercial real estate market analysis involves examination of the local economy combined with market forces research and their influence on market equilibrium that will be in-detail discussed in following chapters.

V.I.I. MACROECONOMIC AGGREGATES

The economic environment of the country has a considerable impact on business activities in all sectors. Since dot-com bubble the UK output was expanding on annual mean growth of 2.7%. Nevertheless, British economy went through a phase of deep recession as Lehman Brothers bankrupted and financial meltdown spread around the globe. (Figure 1) It responded to collapse by a shrunk output of -0.9% in the 2nd quarter 2008. Recession continued until the end of the year 2009 with accumulated fall in output of -7.3% leading British real estate markets including commercial properties in a bubble burst scenario. Moreover, recession induced uncertain economic environment, lower consumption expenditure, declined business and investment activities and restrictions on financial markets that altogether lead to drop in demand for commercial properties resulting in lower rent and asset prices. In turn, real estate markets volatilities inhibited the recovery process and drove UK economy in a double-dip recession in the 2nd quarter 2012.

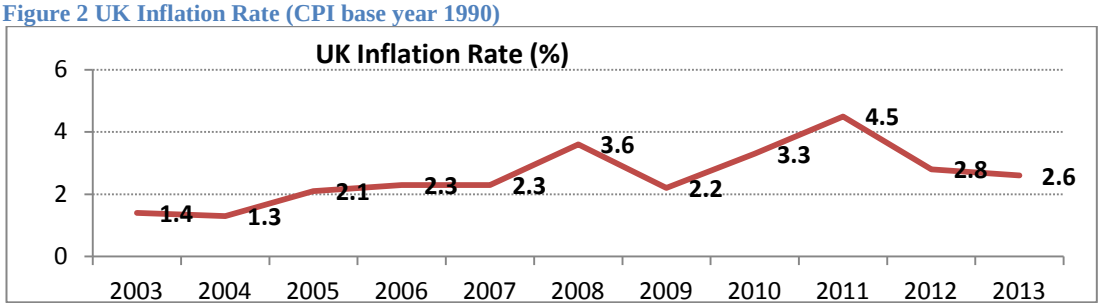
Figure 1 UK Real GDP growth



Source: constructed by author, selected data from "National Income, Expenditure and Output" database of ONS

Despite the fact that future trends are uncertain, there is an optimistic premise since growth in British output has been strengthening from begin of 2013 and annual figure expanded to 2.6 % that ultimately stabilize commercial property markets. The price level in the country designated an appreciation in the pre-crises periods and subsequent decline during recession. (Figure 2) Thereby, inflation reached 3.6% in the year 2008 signifying boosting demand for outputs resulting in increased prices of not only consumer basket of goods and services but also real property prices. The highest inflation during last decade was persisting in the year 2011, as it peaked at 4.5% due to depreciation of sterling[5] and increase in the Value Added Tax[6]. Considering that foreign investors and real estate companies are major holders of commercial properties in the UK, such tendency depreciate in real terms their returns gathered from given investment. Therefore, British commercial property markets were performing relatively weaker in the periods of high inflation. During years 2012-2013 inflation rate was kept at 2.8% and 2.6 %, respectively. These values actually conforms aims of the Bank of England. However, it also signifies appreciation of pound that diminishes potential of new foreign investors to enter the commercial markets in the UK.

Figure 2 UK Inflation Rate (CPI base year 1990)



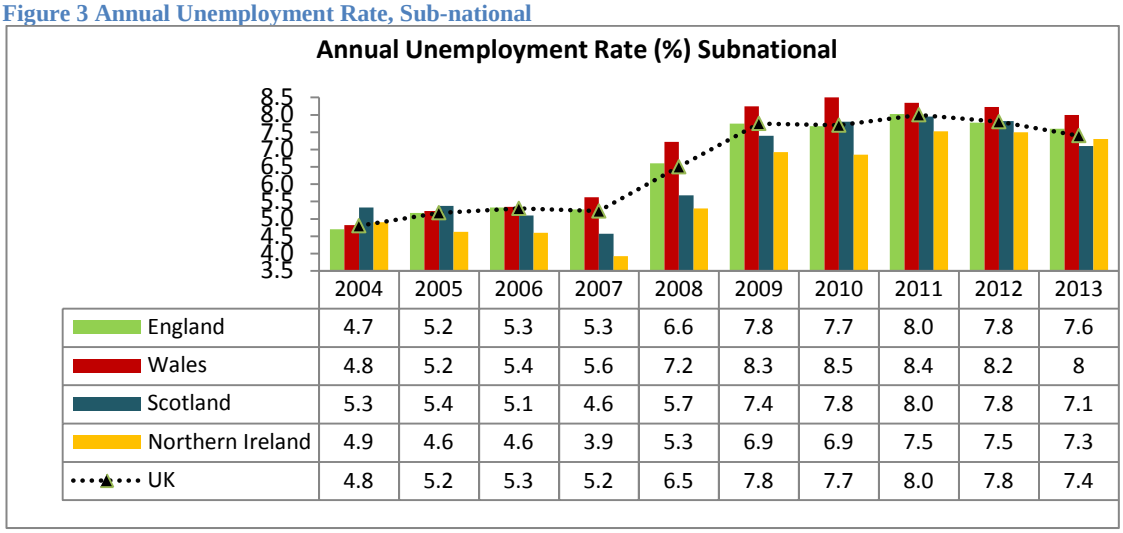
Source: constructed by author, selected data from "Price Indices and Inflation" database ONS

The unemployment rate is another indicator of the health status of economy. Relatively high level of unemployment denotes lower demand on goods and services markets coupled with decline in production outputs stimulating withdrawal of funds from private savings and drop in business operations resulting in decline in demand for commercial real estate. On the contrary, prosperous economy causes fall in unemployment, thereby ensuring commercial property market growth. As spending growth boosts trade volumes, businesses are encouraged to expand and rent more space that is required with increasing number of employees and production. The sharp increment of 1.3% in the British unemployment rate was detected already in the year 2008 indicating concern of

[5] Appendix I Figure : Annual effective exchange rate
[6] BBC news: "UK Inflation Rate Rises to 4% in January," 15th February 2011

businesses with overall economic situation. (Figure 3) Accordingly, unemployment further deepened in the years 2009 and 2011 and achieved 7.8% and 8%, respectively, across the country. Considering the UK constituent countries, unemployment in England and Scotland follow pattern of the national average, whether Wales has historically highest rates comparing to other British countries.

Figure 3 Annual Unemployment Rate, Sub-national



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
England	4.7	5.2	5.3	5.3	6.6	7.8	7.7	8.0	7.8	7.6
Wales	4.8	5.2	5.4	5.6	7.2	8.3	8.5	8.4	8.2	8
Scotland	5.3	5.4	5.1	4.6	5.7	7.4	7.8	8.0	7.8	7.1
Northern Ireland	4.9	4.6	4.6	3.9	5.3	6.9	6.9	7.5	7.5	7.3
UK	4.8	5.2	5.3	5.2	6.5	7.8	7.7	8.0	7.8	7.4

Source: constructed by author, selected data from Official Labour Market Statistics

During the year 2013, rise in output stimulated employment across the UK that improved by nearly 0.4%. However, the values still did not reach pre-2008 levels implying that British economy did not yet fully recover from the impacts of financial breakdown.

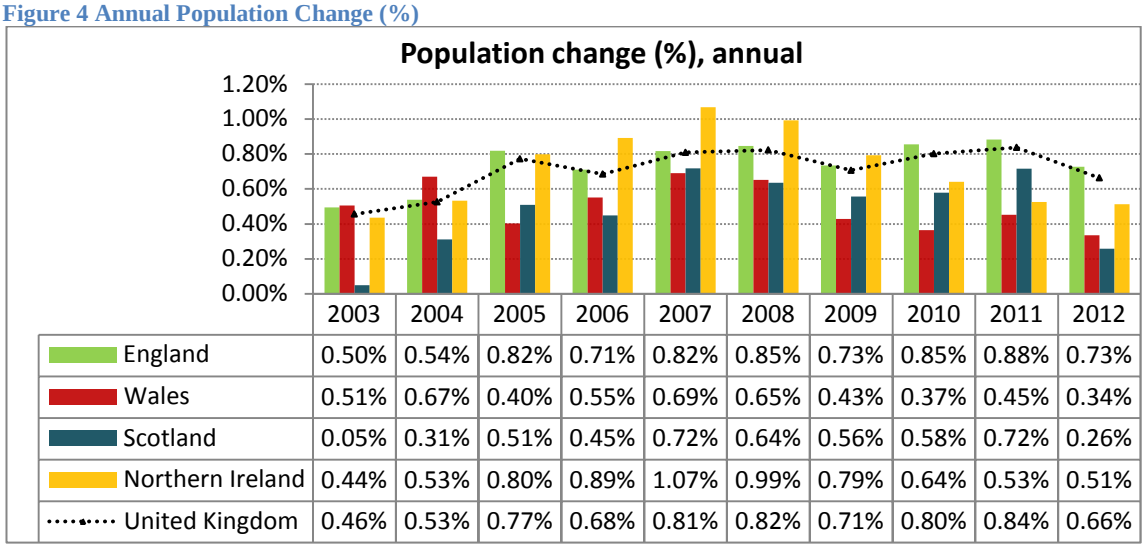
V.I.II. COMMERCIAL REAL ESTATE MARKET DEMAND ANALYSIS

V.I.II.I. Demographic Trends

Demographic characteristics either strengthen or discourage not only demand for housing but also demand for commercial properties. As primary function of income-producing real estate is provision of space for leisure, work, production and sale of services and goods, the population growth has considerable impact on the market dynamics. The population growth has been positive during the last decade. The rate of population change peaked in the year 2007 in the UK constituent countries with exception of England where it occurred in the year 2008. Thereafter, unstable economy reduced the overall confidence and growth dramatically diminished. (Figure 4) The lowest rate was observed in Scotland of 0.05% and 0.26% in the years 2003 and 2013, respectively. Northern Ireland had been experiencing the strongest growth of 1.07% in the year 2008 relative to other countries. However, the values drop by more than 50%

later and equalled 0.51% in the year 2013. England population growth was a little higher than UK average and fluctuated on average of 0.80% since year 2005 whether Wales fluctuation margin was nearly 0.56%.

Figure 4 Annual Population Change (%)

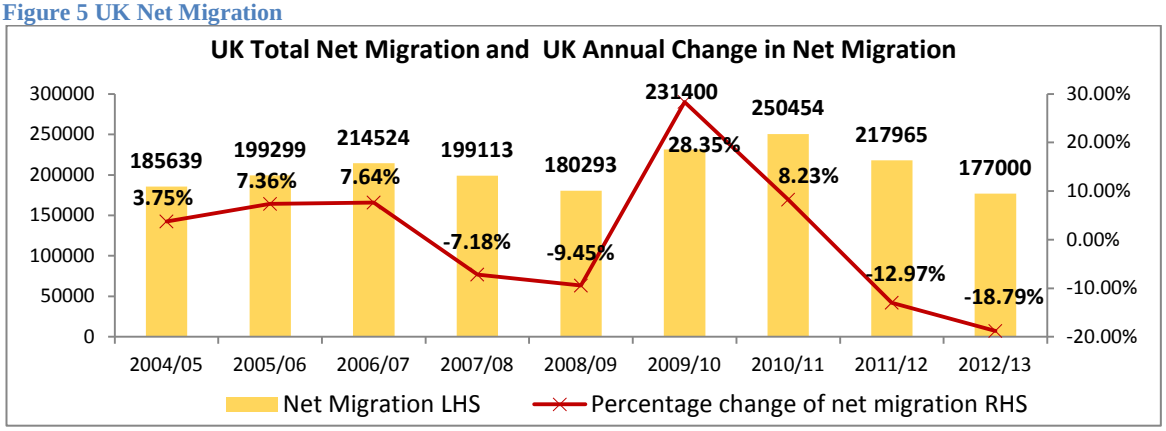


	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
England	0.50%	0.54%	0.82%	0.71%	0.82%	0.85%	0.73%	0.85%	0.88%	0.73%
Wales	0.51%	0.67%	0.40%	0.55%	0.69%	0.65%	0.43%	0.37%	0.45%	0.34%
Scotland	0.05%	0.31%	0.51%	0.45%	0.72%	0.64%	0.56%	0.58%	0.72%	0.26%
Northern Ireland	0.44%	0.53%	0.80%	0.89%	1.07%	0.99%	0.79%	0.64%	0.53%	0.51%
United Kingdom	0.46%	0.53%	0.77%	0.68%	0.81%	0.82%	0.71%	0.80%	0.84%	0.66%

Source: computed by author, data from ONS, NISRA, StatWales and Scottish Government

Net migration also represents demographics shifts since it contributes to the population changes. Surprisingly that during economic boom in the UK, growth in net migration rate decreased. (Figure 5) However, this is explained by inflation persisting in the country and unaffordable cost of living including unsustainable growth in housing rent prices.[7] Immigration exceeded emigration in absolute quantities during the whole observation period though falls in annual changes occurred.

Figure 5 UK Net Migration



Source: change computed by author, migration data from ONS, StatWales, NISRA, Scottish Government

The selection of the place of residence is stipulated by the availability of jobs, economic stability and prosperity of the country. Notably, the most popular destination of

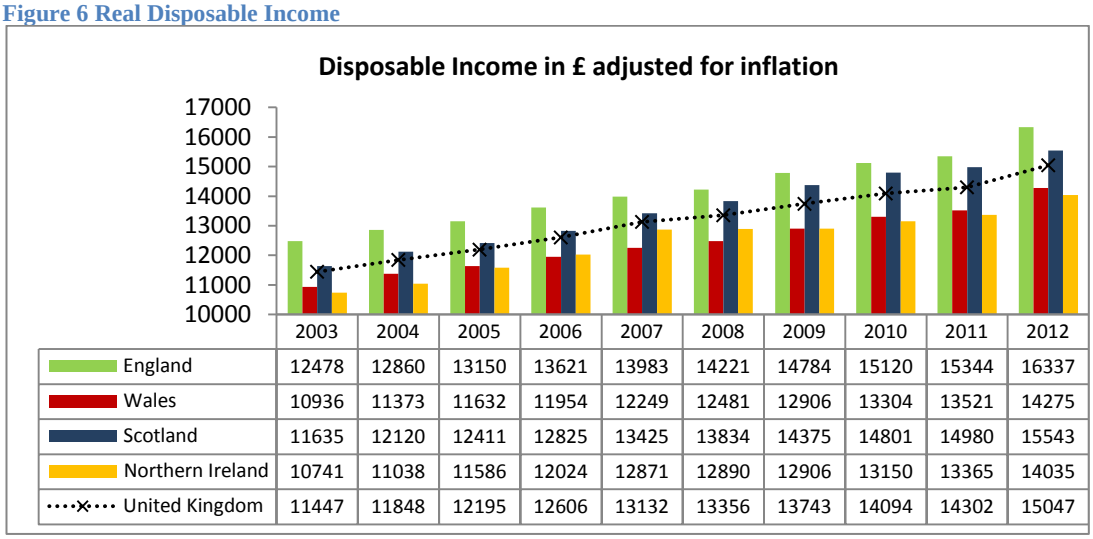
[7] Kuenzel R, Bjornbak B: "The UK Housing Market Bubble: Anatomy of a House Price Boom," Economic Analysis from the European Commission's Directorate-General for Economic and Financial Affairs, Volume 5, Issue 11, Published by European Commission, October 2011 [25]

immigrants is England[8] that encompass for nearly 80% from total net migration, whether Northern Ireland is the least attractive. Migrants mainly reflect demand for rentable apartments that enters into commercial property market segment as income-producing property. Thus, positive migration balance evolves income-producing real estate markets.

V.I.II.II. Sector-specific demand drivers

Consumer spending power is basically influenced by their income that expresses demand characteristics on the markets. Thus, growth in its value is associated with greater consumption and contributes to the expansion of retail property markets. Additionally, it designates greater creditworthiness. Hence, it shapes the commercial real estate markets as private investors enter it. Across the UK constituent counties it is monitored an increase in the real disposable income. (Figure 6) Sluggish macroeconomic environment coupled with rising inflation had undoubtedly impact on real disposable incomes. The slowest growth in its values persisted during years 2008 and 2011 with average figures of 1.71% and 1.48%, respectively. England and Scotland are major contributors to the British economy and richest nations among other countries. Real disposable income in both countries actually exceeds the UK average, while the rest UK countries are slightly below the corresponding value.

Figure 6 Real Disposable Income



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
England	12478	12860	13150	13621	13983	14221	14784	15120	15344	16337
Wales	10936	11373	11632	11954	12249	12481	12906	13304	13521	14275
Scotland	11635	12120	12411	12825	13425	13834	14375	14801	14980	15543
Northern Ireland	10741	11038	11586	12024	12871	12890	12906	13150	13365	14035
United Kingdom	11447	11848	12195	12606	13132	13356	13743	14094	14302	15047

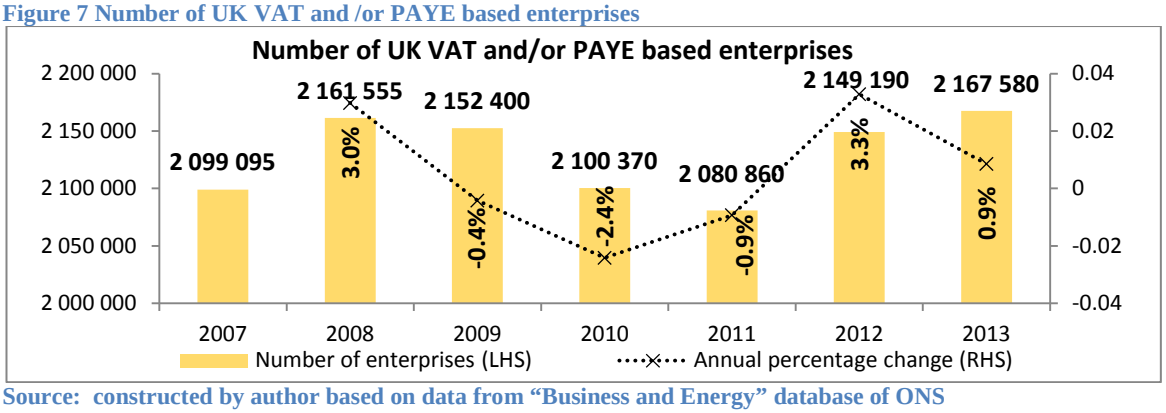
Source: adjustment computed by author, based on data from ONS, NISRA, StatWales, Scottish Government

UK businesses represent key interest group in income-producing properties, because of various usage of commercial space in manufacturing, distribution, storage, provision

[8] Appendix I, Table 7: Distribution of annual net migration among UK constituent countries

and sale of products. The credit crunch weakened position of British enterprises that were induced to bankrupt due to reduced aggregate demand, volatile property markets and financial restrictions. Since the year 2008, the number of UK VAT and/or PAYE[9] based enterprises declined by -3.7% in the period from 2009-2011 and 80695 of them shut down their operations. (Figure 7) Nonetheless, values were gradually recovering in the subsequent years and outreached the pre-crises figures.

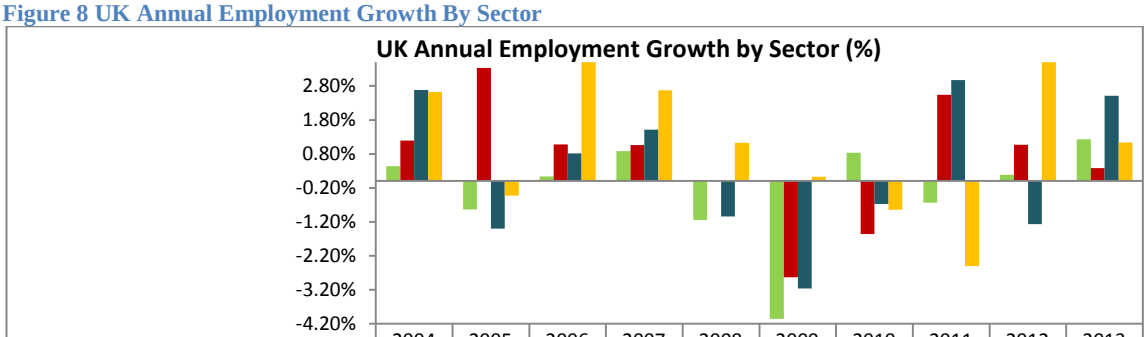
Figure 7 Number of UK VAT and /or PAYE based enterprises



Source: constructed by author based on data from "Business and Energy" database of ONS

Employment by sector reflects performance of industries and demand for space on each of commercial property submarkets. The operations on transportation and storage industries are more stable, and negative growth in employment was induced only by economic misbalance in the years 2009-2010. (Figure 8)

Figure 8 UK Annual Employment Growth By Sector



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Wholesale and Retail Trade;	0.44%	-0.83%	0.14%	0.88%	-1.15%	-4.06%	0.83%	-0.64%	0.19%	1.23%
Transportation and Storage	1.19%	3.33%	1.08%	1.06%	0.00%	-2.83%	-1.56%	2.54%	1.07%	0.38%
Accommodation and Food Service Activities	2.68%	-1.40%	0.81%	1.51%	-1.04%	-3.16%	-0.67%	2.98%	-1.27%	2.52%
Financial, Legal, Insurance and Real Estate Services	2.63%	-0.42%	6.60%	2.67%	1.13%	0.13%	-0.84%	-2.50%	4.02%	1.13%

Source: growth computed by author based on data from Official Labour Market Statistics

As follows, demand for industrials on the commercial property markets has been strengthen by developments on this sector. By contrast, operations on other industries are relatively volatile. Employment in these sectors had been fluctuating during last

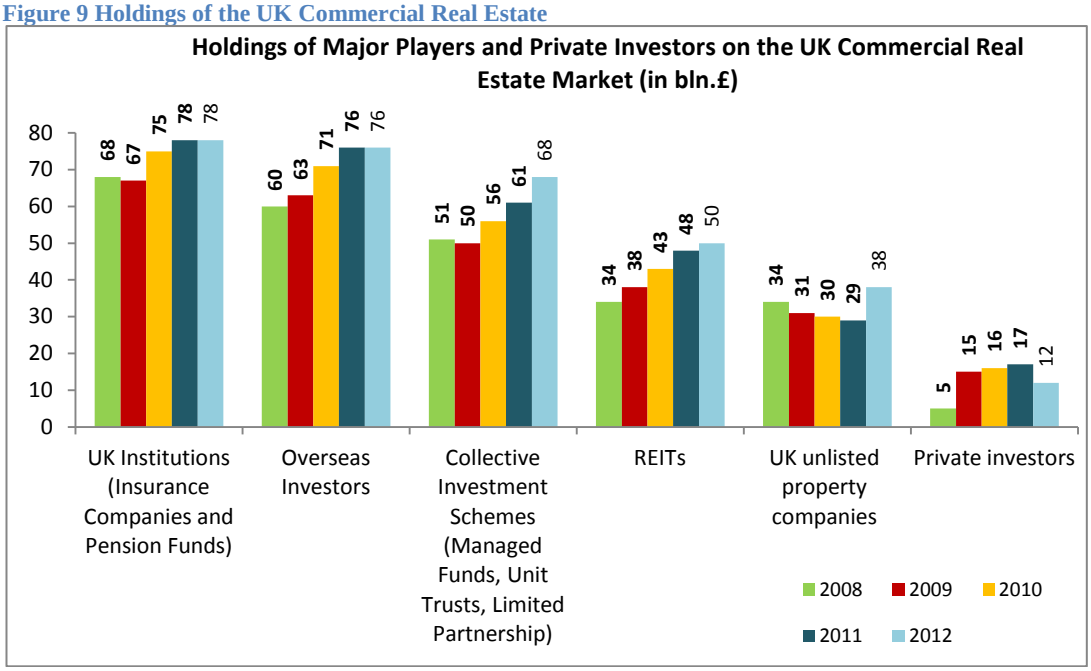
[9] Pay As You Earn – Income tax and National Insurance Contribution collection system, further information available on: HM Revenue and Customs: "PAYE for employers-the basics" [48]

decade indicating inefficiencies on associated commercial property markets as corresponding demand had been unstable. Accordingly, the largest fall in the employment growth in these sectors occurred due to financial collapse. Afterwards, sectors had been struggling to expand, though the recovery is still questionable.

V.I.II.III. Investment Activity Indicators

Commercial real estate markets lately are considered as conventional investment channel for gaining high returns and spread risks by diversifying portfolio. Insurance companies and pension funds accumulated nearly £78 billion in the year 2012 with a captured share of 22.4% from total asset values. (Figure 9) In the year 2008, UK institutions experienced large drop of -16%[10] in their holdings since economic breakdown forced them to dispose some commercial assets in order to stabilize internal operations. Nonetheless, they still dominate the British income-producing property market, while other investor groups had been gradually emerging.

Figure 9 Holdings of the UK Commercial Real Estate



Source: Constructed by author, data selected from British Property Federation

The second largest holdings belong to the overseas investors that possessed £60 billion or 21.9% in the year 2008. To assess the magnitude of shifts in investment trends, it is necessary to mention that holdings of foreign investors in the mid-1990[s] compounded for nearly 10%, while UK institutions holding were 48%.[11] Depreciation of pound in

[10] British Property Federation "Property Data Report 2009"
[11] MacGrefor, B.D.: "The Economics of Commercial Property Markets" [1]

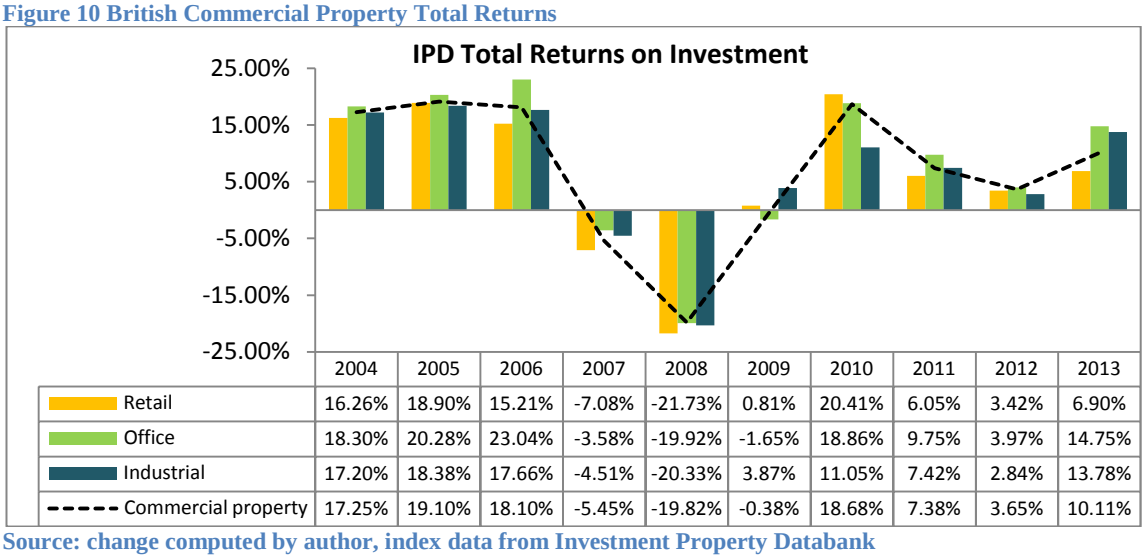
relation to USD and EUR in the beginning of 2000[s] performed as major stimuli for foreign investors' entrance in British commercial property market[12]. In subsequent periods, they have been refining their market position by enlargement of asset holdings at average annual growth rate of 8% and reached £76 billion. On the other hand, the most rapid growth had undergone collective investment schemes with annual average increment of 19% in the period 2003-2008[13]. Thereby, their possessed holdings amounted to £68 billion with a market share of 19.5% in the year 2012. REITs had been gradually expanding their investments in the UK commercial property market by annual change of 10% and represented the fourth largest market player with accumulated assets of £50 billion in the year 2012. With regard to unlisted property companies, their capital inflow in commercial properties had been fluctuating. Asset disposal originated in the period 2008-2011driven by financial crises, and capitals of unlisted property companies declined by 15%. In the year 2012, their holdings were replenished and compounded £38 billion. The smallest share on the British commercial property market embraced private investor group. UK Banks lending restriction coupled with widespread economic uncertainty severely affected private investors and their loss in income-producing properties was -38% in the year 2008 compared with corresponding figure for the year 2003[14]. Next year, their investment inflow tripled and accounted £15 billion. However, double-dip recession and continuing tight credit conditions resulted in asset disposal of 7% that occurred in the year 2012. The operations of private investors are relatively unstable, because of their huge reliance on external borrowing and macroeconomic environment. It is apparent that there are high barriers in entering British commercial property market due to expensive transaction process. Accordingly, market is dominated by the institutions and overseas investors that manage either own sources of finance or obtain them from foreign lending institutions.

Prior to meltdown, the British commercial property market was associated with a strong performance by delivering double-digit returns to investors. Being attracted by such trends, investment inflow on capital markets stimulated further growth in total ROI. Investors were attracted by high returns and financial liberalization that boosted demand to unprecedented level leading to total returns of 17.66% in British commercial property

[12] Appendix I: Figure 35: Annual Effective Exchange Rate
[13] British Property Federation "Property Data Report 2009"
[14] British Property Federation "Property Data Report 2009"

markets. (Figure 10) Economic downturn accelerated the commercial property bubble burst. Domino effect started with collapse of both US sub-prime mortgage market and Irish banking sector induced overseas investors to withdraw their funds from UK commercial real estate market. Moreover, susceptibility of commercial property to changes in lending conditions worsened the overall situation. Altogether, shifts in economic environment caused a severe recession with total returns on investment decline of -25.66%. The tension on the British commercial property market is still persistent as volatility was not reduced and double-dip recession was an extra-shock in the year 2012. Despite the fact that it managed to keep returns above zero, they were lowest during after-crises period. By studying total returns figures it is apparent that British commercial property market is currently on recovery path, though values have not yet reached pre-2008 levels.

Figure 10 British Commercial Property Total Returns



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Retail	16.26%	18.90%	15.21%	-7.08%	-21.73%	0.81%	20.41%	6.05%	3.42%	6.90%
Office	18.30%	20.28%	23.04%	-3.58%	-19.92%	-1.65%	18.86%	9.75%	3.97%	14.75%
Industrial	17.20%	18.38%	17.66%	-4.51%	-20.33%	3.87%	11.05%	7.42%	2.84%	13.78%
Commercial property	17.25%	19.10%	18.10%	-5.45%	-19.82%	-0.38%	18.68%	7.38%	3.65%	10.11%

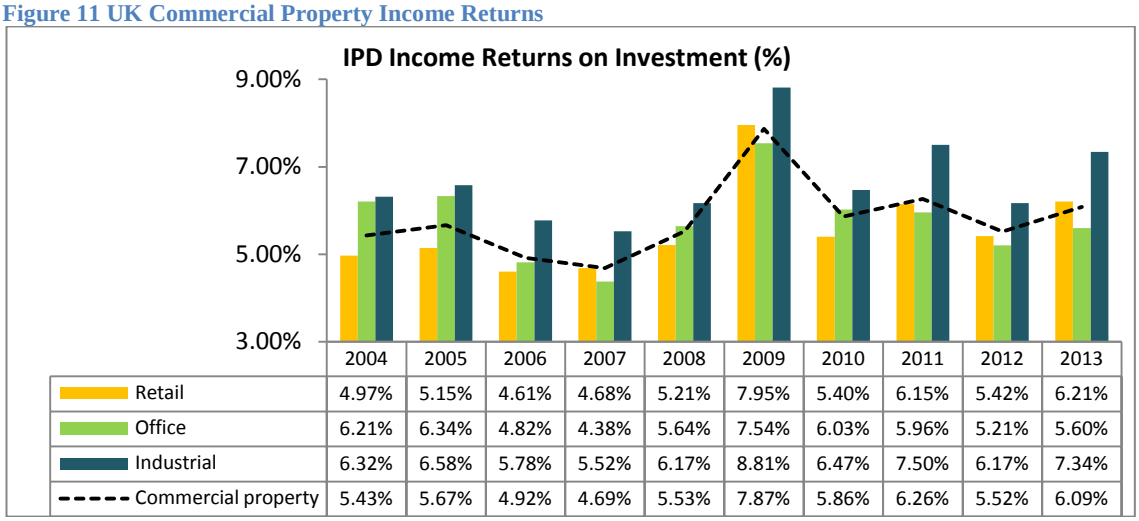
Source: change computed by author, index data from Investment Property Databank

Turning to submarkets, office property driven by intensive enlargement of financial, insurance and legal services was best performing asset class that gained returns of 23.04% in the year 2006. Assuredly, deterioration of financial and insurance enterprises fostered collapse of office markets, which experienced accumulated drop in returns of -25.4% during period from 2009-2010. While the most strongly was affected the retail property sector with corresponding decline of -28.85% that was influenced by ubiquitous spending cuts, rising unemployment and shrunk business operations. The retail properties are still unstable with fluctuating total returns on quite high margin. Returns of industrials conforms patterns of national commercial property markets though it appeared to be least volatile market in after-2009 period since its returns

deviate on lower rate relative to other income-producing properties. During the year 2013, office space generated highest total returns of 14.75% relative to other asset class. The least performing asset was retail property with returns of 6.9%.

Income return on investment (ROI) indicator provides a snapshot of the rent market developments that assist in investment decisions. The UK commercial property generates on average extra 5.78£ per annum on every 100£ invested in it as initial cost. (Figure 11) The highest income ROI produces industrials on average of 6.7%. Regarding office and retail properties, their income ROI indicators deviate over same long-term average figure of 5.6%. However, retail property used to earn lower rate of income until recent economic crises. Afterwards its values exceeded the income ROI on office property market. During financial collapse income returns increased on all commercial property markets evolved by asset values decline. It is important to mention that income ROI in the UK outweighs the inflation rate designating that owners of income-producing properties are protected from the effects on inflation as rents grow at faster rate than commodity prices.

Figure 11 UK Commercial Property Income Returns



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Retail	4.97%	5.15%	4.61%	4.68%	5.21%	7.95%	5.40%	6.15%	5.42%	6.21%
Office	6.21%	6.34%	4.82%	4.38%	5.64%	7.54%	6.03%	5.96%	5.21%	5.60%
Industrial	6.32%	6.58%	5.78%	5.52%	6.17%	8.81%	6.47%	7.50%	6.17%	7.34%
Commercial property	5.43%	5.67%	4.92%	4.69%	5.53%	7.87%	5.86%	6.26%	5.52%	6.09%

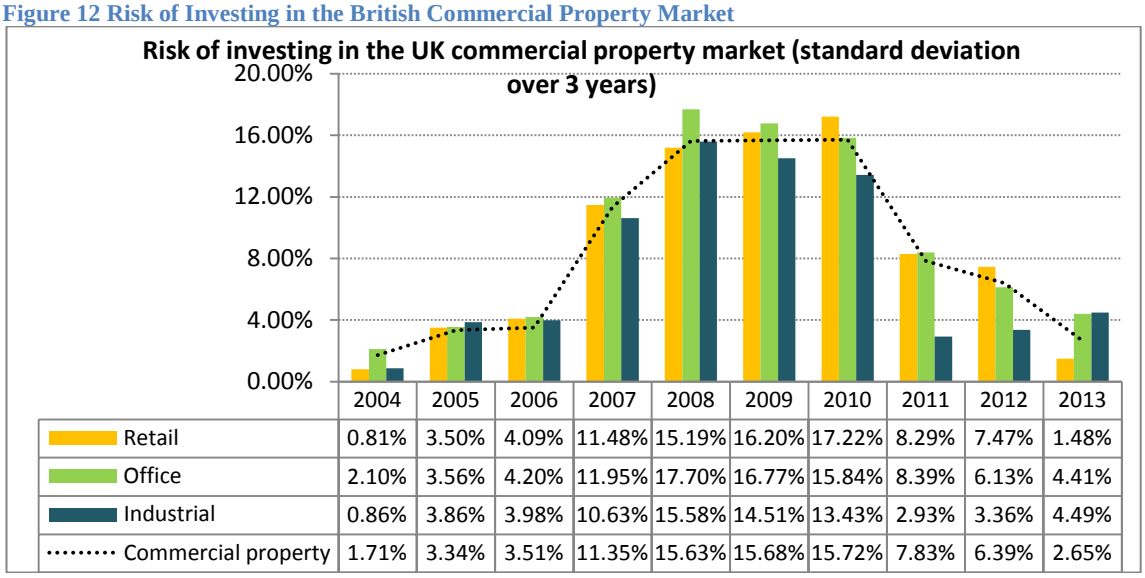
Source: change computed by author, index data from Investment Property Databank

Since investor decision is not purely based on income potential of property and its effectiveness, but also depends on opportunities for future growth and riskiness of investment, risk annualized over three years was derived[15] for the British commercial properties. Risk of investing in commercial property markets captures magnitude of deviations of its total returns and margins of fluctuations. As it was mentioned before, the performance of British commercial property market in the pre-crises period was

[15] Computed based on standard deviation of total returns on investment

outstanding what is confirmed by risk spreads over 3 years of 2.86% that outperformed corresponding figure of 6.96% for UK bonds.[16] Low risks combined with high returns stimulated market growth resulting in unsustainable capital inflation. As boom-busts episode originated on British commercial property markets, risks of investment in it rapidly increased during the period 2007-2010 when the average investment riskiness was 14.59%. Notably, the most volatile asset group is office property that is associated with highest risks of investment. The risk spread over 10 years in office property market was 9.11%, whereas corresponding figures for retail and industrials were 8.57% and 7.36%, respectively. Accordingly, industrial represent the lowest risk option among other types of commercial assets. By taking into consideration its high efficiency, it can be concluded that industrials were the most attractive sector for investments in income-producing properties.

Figure 12 Risk of Investing in the British Commercial Property Market



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Retail	0.81%	3.50%	4.09%	11.48%	15.19%	16.20%	17.22%	8.29%	7.47%	1.48%
Office	2.10%	3.56%	4.20%	11.95%	17.70%	16.77%	15.84%	8.39%	6.13%	4.41%
Industrial	0.86%	3.86%	3.98%	10.63%	15.58%	14.51%	13.43%	2.93%	3.36%	4.49%
Commercial property	1.71%	3.34%	3.51%	11.35%	15.63%	15.68%	15.72%	7.83%	6.39%	2.65%

Source: computed by author as standard deviation of total returns

V.I.III. BRITISH COMMERCIAL PROPERTY MARKET SUPPLY[17]

OVERVIEW

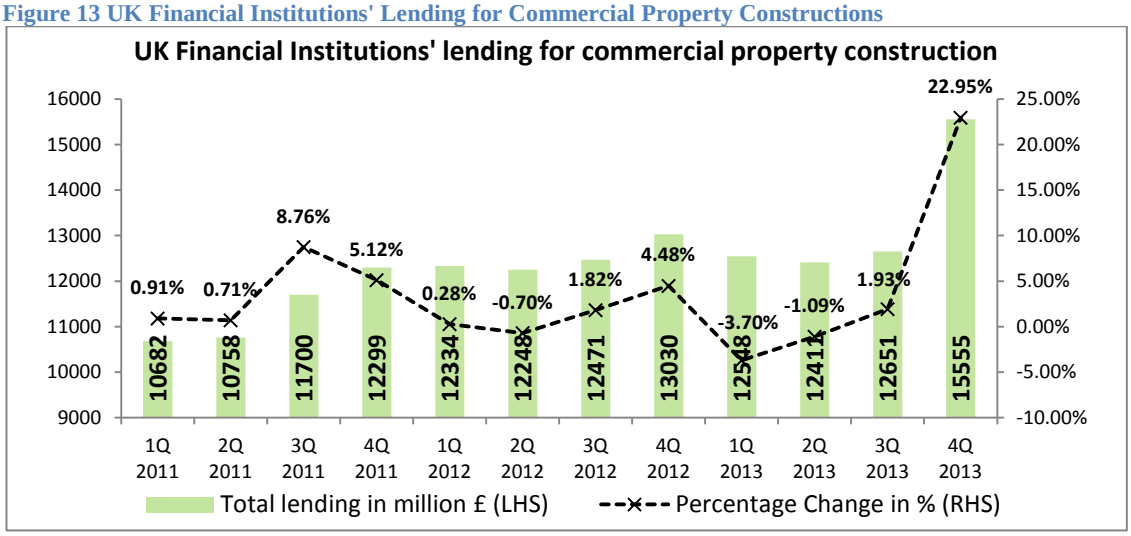
Developers, constructors and property owners are proxy for supply side of commercial property market. The suppliers of income-producing space on the market strongly rely on lending conditions as construction of buildings is costly. Since the late-2000[s] crises, financial markets across the country were struggling to improve their balance sheets as

[16] Appendix I: Figure 36: UK Bond Risk, it was computed as standard deviation of yield which data available in Bank of England database

[17] All supply figures include only private commercial space

amount of default loans were increasing.[18] Thereby, UK banks' implementation of tightening conditions was an only rationale. However, such practice further worsened the situation on the property markets as supply responsiveness further deteriorated due to constrained credit availability and high cost of borrowing. The Bank of England data on recent lending trends express that imposed restrictions were still persist on financial markets and amount of funds granted for commercial property transactions was oscillating during last three years. (Figure 13)

Figure 13 UK Financial Institutions' Lending for Commercial Property Constructions



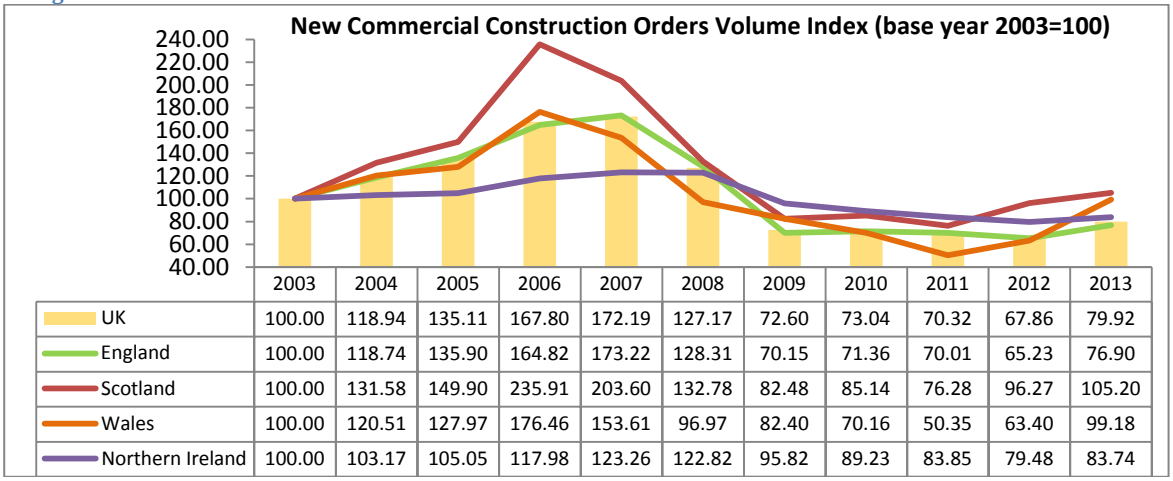
Source: quarterly change computed by author, data selected from Bank of England

During the last quarter 2013 the credit availability improved and amount of lending increased by 22.95% compared to preceding quarter, while annual growth constituted 6.1%. Thereby, it is expected an optimistic forecasts for nearest future market dynamics. New construction orders of commercial properties reflect coming on-line supply of space. (Figure 14) The indicator tracks the bubble scenario across UK constituent countries. The magnitude reached extraordinary growth in the year 2007 when the British new commercial construction orders increased by 72.19% relative to the base year. Scottish construction industry was the fastest booming - new commercial orders more than doubled in the years 2006 and 2007, whether growth in Northern Ireland was rather sustainable with associated figures of 17.98% and 23.26%. Considering Wales, volume index corresponded national development path and peaked at 176.46 in the year 2006. Imposition of lending restrictions and volatile economy set back construction industry operations and abrupt reduction of nearly 50% in order volumes arose in the

[18] CBRE: " Credit crunch and the property market", Published by Greater London Authority, London , May 2008, ISBN 9781847811684

successive year. The role of financial institutions in the construction industry reinforced by study of volume index since it follows trends in lending amounts: there is observed and improvement in volumes of commercial construction orders in the year 2013 matching direction of credit grants.

Figure 14 New Commercial Construction Orders Volume Index

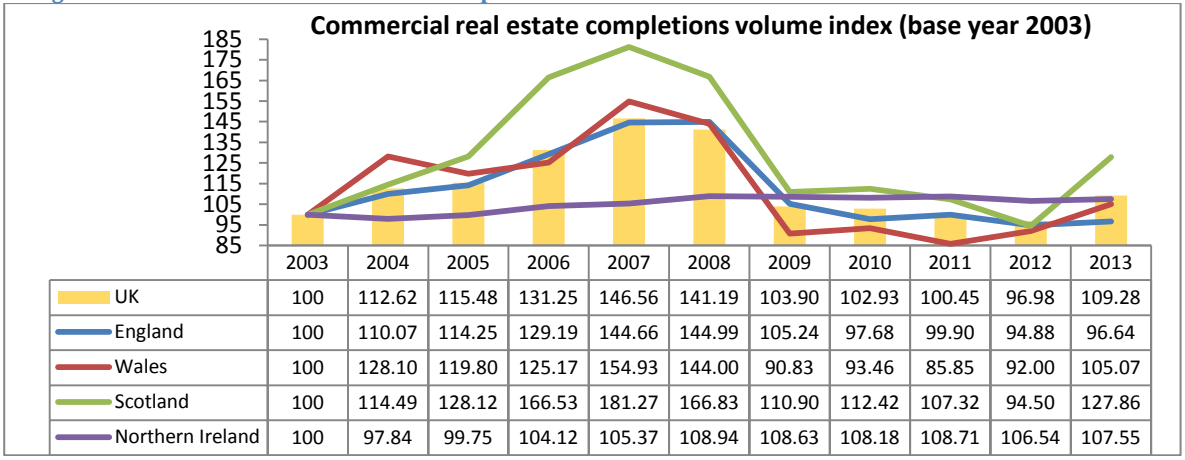


	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
UK	100.00	118.94	135.11	167.80	172.19	127.17	72.60	73.04	70.32	67.86	79.92
England	100.00	118.74	135.90	164.82	173.22	128.31	70.15	71.36	70.01	65.23	76.90
Scotland	100.00	131.58	149.90	235.91	203.60	132.78	82.48	85.14	76.28	96.27	105.20
Wales	100.00	120.51	127.97	176.46	153.61	96.97	82.40	70.16	50.35	63.40	99.18
Northern Ireland	100.00	103.17	105.05	117.98	123.26	122.82	95.82	89.23	83.85	79.48	83.74

Source: index computed by author based on data from Scottish Government, ONS, RICS, Forfas,

Completions volumes index measures newly build stock of space and it determines the availability of existing stock.[19]. (Figure 15, Figure 16) The UK commercial real estate completions also depicted the cycle scenario during last decade. The commercial construction industry in England has not yet recovered up to the values of the year 2003, while other sub-national markets already exceeded the base year figures.

Figure 15 UK Commercial Real Estate Completions Volume Index



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
UK	100	112.62	115.48	131.25	146.56	141.19	103.90	102.93	100.45	96.98	109.28
England	100	110.07	114.25	129.19	144.66	144.99	105.24	97.68	99.90	94.88	96.64
Wales	100	128.10	119.80	125.17	154.93	144.00	90.83	93.46	85.85	92.00	105.07
Scotland	100	114.49	128.12	166.53	181.27	166.83	110.90	112.42	107.32	94.50	127.86
Northern Ireland	100	97.84	99.75	104.12	105.37	108.94	108.63	108.18	108.71	106.54	107.55

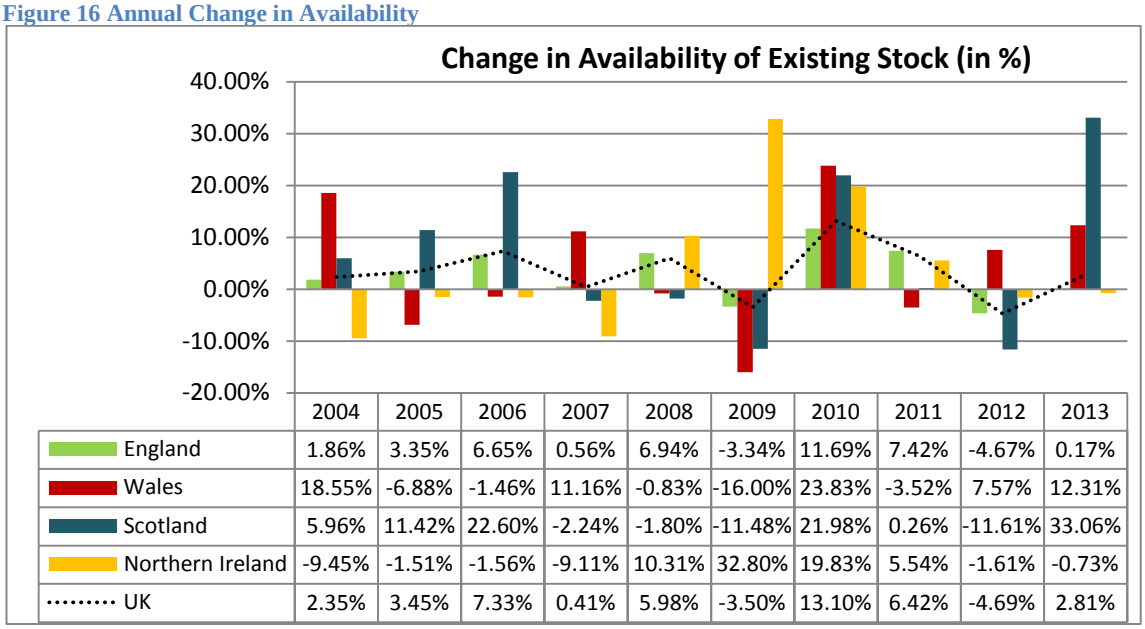
Source: index computed by author based on data from ONS, Forfas, RICS, Scottish Government,

Availability on England commercial property market worsened in the years 2009 and 2012 as supply was significantly shrunk, what signify decline in rent options for tenants.

[19]Availability is simply equal to unoccupied stock, computed as total stock multiplied by vacancy rate, and do not incorporate developments under construction that are already available for pre-let, since data was not available

Apparently, Scottish volume index was strengthening UK average values since it supplied commercial stock at higher rate relative to other nations. However, amount of non-leased space on the market was also increasing indicating rising vacancies and oversupply. Regarding Northern Ireland, the completions volume was relatively stable so that even breakdown and double-dip recession did not much affect new supply, which remained on almost same growth level. Nevertheless, its commercial property market was undersupplied over long-term, which is reflected in availability change figures that had positive growth only in the period 2008-2011. In other countries new completion volume was considerably reduced in the year 2008. Considering unsustainable supply growth in Scotland, volumes of completions there declined by 87% from peak to trough, whereas in England and Wales it amounted to 50% and 70%, respectively. During the last year, supply was enhanced in the UK. Correspondingly, availability improved in all nations with exception of Northern Ireland. Thereby, amount of unoccupied rentable space directly reflects supply figures.

Figure 16 Annual Change in Availability



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
England	1.86%	3.35%	6.65%	0.56%	6.94%	-3.34%	11.69%	7.42%	-4.67%	0.17%
Wales	18.55%	-6.88%	-1.46%	11.16%	-0.83%	-16.00%	23.83%	-3.52%	7.57%	12.31%
Scotland	5.96%	11.42%	22.60%	-2.24%	-1.80%	-11.48%	21.98%	0.26%	-11.61%	33.06%
Northern Ireland	-9.45%	-1.51%	-1.56%	-9.11%	10.31%	32.80%	19.83%	5.54%	-1.61%	-0.73%
UK	2.35%	3.45%	7.33%	0.41%	5.98%	-3.50%	13.10%	6.42%	-4.69%	2.81%

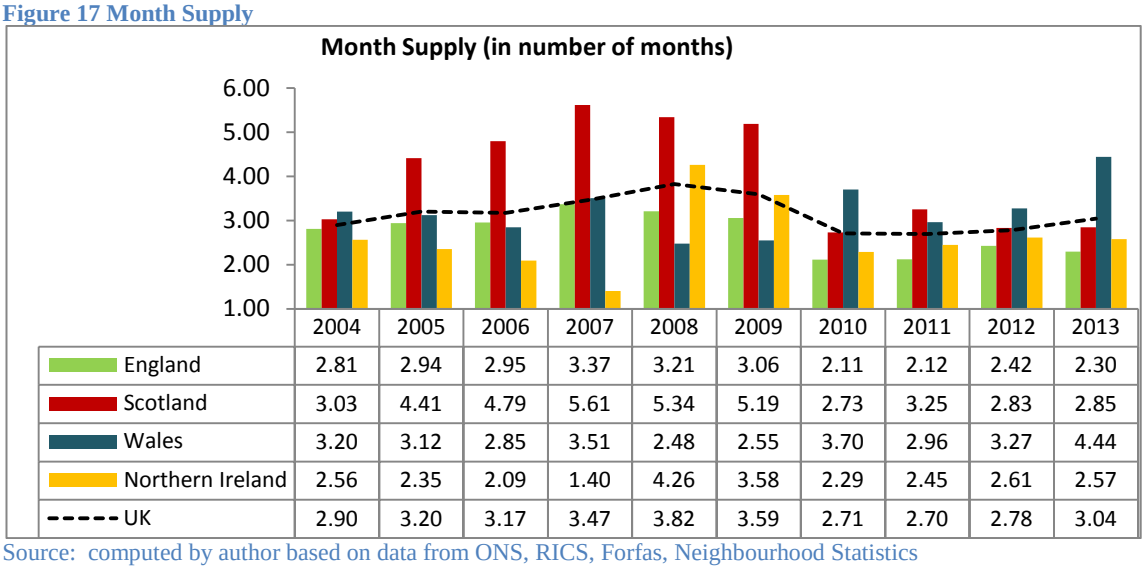
Source: computed by author based on data from ONS, RICS, Forfas, Neighbourhood Statistics

Month supply[20] expresses the amount of time required to occupy current and future available stock on the market and depicts whether supply growth corresponds demand changes. Noticeably, month supply conform availability changes since both provide information about unoccupied space, if availability is measured in volume metric, month supply determine time scale. Accordingly, there is detected increase in month

[20] Computed as sum of annual vacancies and new orders divided by net absorption divided by 12

supply with rising availability and vice versa. This trend verifies direct correlation of figures with supply indicators. During the observation period, month supply on the British commercial property market was oscillating from 2.5 to 4 months needed for absorption of current stock. (Figure 17) It was highest in Scotland indicating that demand growth is not sufficient to occupy current available space on market. At the same time, respective values for Wales were fluctuating over 10-year mean of 3.21 signifying that construction rate exceeded demand. Yet, despite the credit crunch impacts, month supply values did not deviate abruptly, because the supply of developable land and, hence, new constructions, have been historically unresponsive to demand and price pressures in the UK induced by land-use restrictions.

Figure 17 Month Supply



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
England	2.81	2.94	2.95	3.37	3.21	3.06	2.11	2.12	2.42	2.30
Scotland	3.03	4.41	4.79	5.61	5.34	5.19	2.73	3.25	2.83	2.85
Wales	3.20	3.12	2.85	3.51	2.48	2.55	3.70	2.96	3.27	4.44
Northern Ireland	2.56	2.35	2.09	1.40	4.26	3.58	2.29	2.45	2.61	2.57
UK	2.90	3.20	3.17	3.47	3.82	3.59	2.71	2.70	2.78	3.04

Source: computed by author based on data from ONS, RICS, Forfas, Neighbourhood Statistics

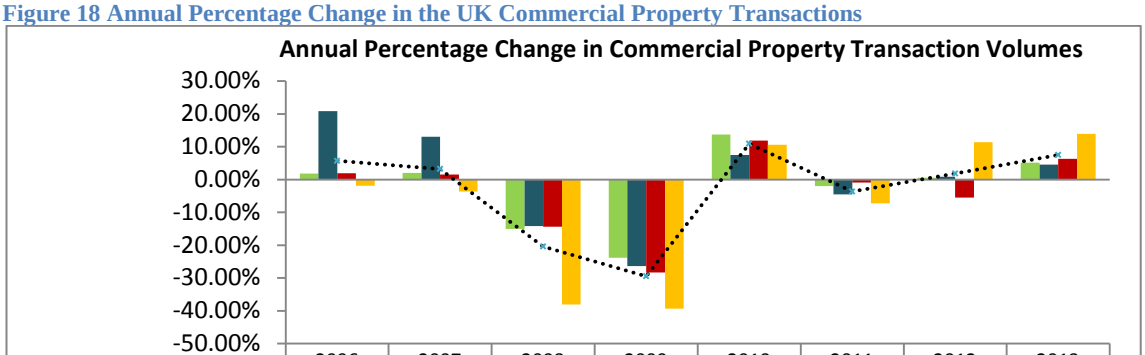
V.I.IV. EQUILIBRIUM ANALYSIS

V.I.IV.I. Transaction Indicators

Volume of commercial real estate transactions depicts change of ownership in real property and reflects demand and supply interactions on the asset market. (Figure 18) The volume of transactions was significantly reduced by -20.41% and -29.46% during recession. Such development was not surprising as investment activity, employment, consumer expenditure, quantity of enterprises and construction output declined, the transaction volume followed pattern. Thereafter, British commercial property market was unstable resulting from financing difficulties and volatile economy leading businesses to struggle for survival. On the sub-national level, the worst performance of commercial asset market occurred in Northern Ireland, where transactions growth was negative in 5 out of 8 observations denoting that renting of space is much more

preferable than asset purchase, what was affirmed by shrunk availability. The Scottish asset market was boosting in the pre-crises period, which was governed by demand pressures and attractiveness of investment that pulled construction industry. Regarding Wales and England, their commercial asset market was deviating in similar manners. However, Welsh asset market was more susceptible to bubble and did not fully recover.

Figure 18 Annual Percentage Change in the UK Commercial Property Transactions



	2006	2007	2008	2009	2010	2011	2012	2013
England	1.82%	2.01%	-15.06%	-23.81%	13.74%	-1.98%	0.55%	5.18%
Scotland	20.89%	13.05%	-14.15%	-26.33%	7.46%	-4.55%	0.88%	4.60%
Wales	1.94%	1.58%	-14.33%	-28.36%	11.93%	-0.91%	-5.49%	6.30%
Northern Ireland	-1.89%	-3.65%	-38.12%	-39.35%	10.64%	-7.21%	11.40%	13.95%
UK	5.69%	3.25%	-20.41%	-29.46%	10.94%	-3.66%	1.83%	7.51%

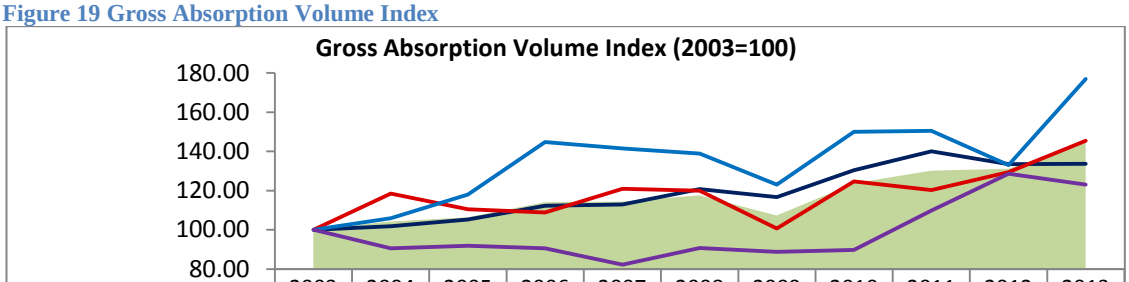
Source: change computed by author based on data from Land Registry

Gross absorption[21] captures amount of the leased space per annum and reflects transactions on the rentable space market. In the past decade, the British commercial space market had a strong performance as gross absorption had been rising. (Figure 19) Slight decline occurred in the year 2009 by 10.3% denoting weakened demand for space. However, market depicted recovering figures in succeeding years and amount of new leases grew by 44.75% in the year 2013 relative to base value. Regarding sub-national level, Scottish commercial space market bubbled at highest rates with mean magnitude of 38.25% that stimulated growth in construction outputs. Obviously, the market is very volatile as two short-term cycles distinguished during observation period. In contrast, gross absorption on commercial space market in England was relatively stable indicating continuous entrance of new renters and persistent demand on the market. In Wales the market demand was unstable as gross absorption was deviating over 10 year trend of 119.92. Transaction activity on Northern Ireland commercial space market was weakest compared to other nations. By taking into account declining

[21] Gross absorption in absolute values computed as existing stock multiplied by percentage of leased space. Information of leased space percentage available at British Property Federation

availability of space, it has sense that leasing transactions lagged behind the base year values until the market situation changed in the year 2010 boosting gross absorption.

Figure 19 Gross Absorption Volume Index

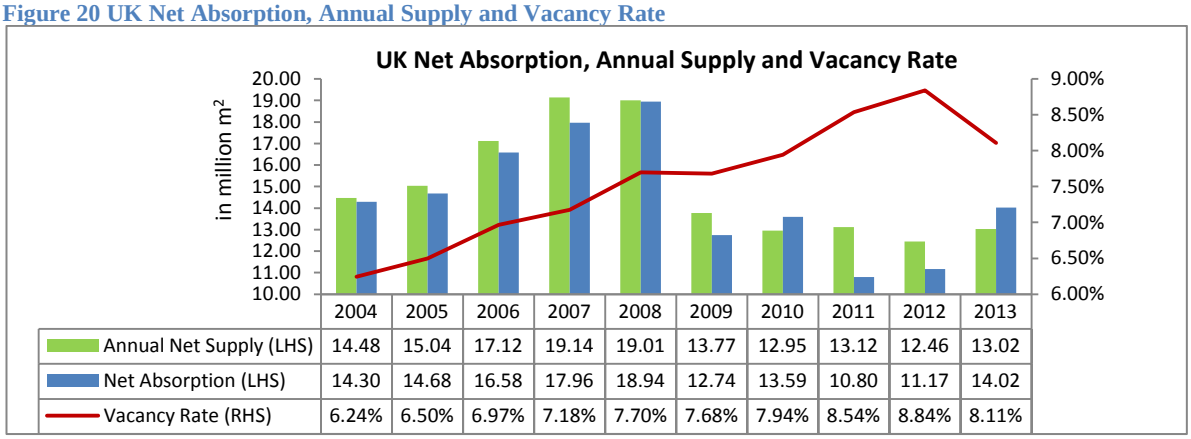


	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
UK	100.00	104.23	106.41	114.07	114.39	117.59	107.29	123.71	130.16	131.13	144.75
England	100.00	101.86	105.28	112.28	112.92	120.75	116.71	130.36	140.03	133.50	133.72
Wales	100.00	118.55	110.40	108.79	120.93	119.93	100.73	124.73	120.34	129.45	145.39
Scotland	100.00	105.96	118.06	144.73	141.49	138.95	123.00	150.03	150.43	132.96	176.92
Northern Ireland	100.00	90.55	91.92	90.49	82.24	90.72	88.73	89.73	109.83	128.63	122.99

Source: computed by author based on data from ONS, RICS, Forfas and Property Data

Study of net absorption[22] combined with analyses of supply and vacancy rate provide a more comprehensive picture of the market development. (Figure 20) If net absorption, which defines change in the amount of newly occupied space, outreaches net supply then vacancies fall and vice versa. Accordingly, net supply of commercial property exceeded net absorption in the UK over last decade inducing increasing vacancy rate. Natural vacancy[23] of 7.66% is regarded as threshold for measuring supply variations.

Figure 20 UK Net Absorption, Annual Supply and Vacancy Rate



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Annual Net Supply (LHS)	14.48	15.04	17.12	19.14	19.01	13.77	12.95	13.12	12.46	13.02
Net Absorption (LHS)	14.30	14.68	16.58	17.96	18.94	12.74	13.59	10.80	11.17	14.02
Vacancy Rate (RHS)	6.24%	6.50%	6.97%	7.18%	7.70%	7.68%	7.94%	8.54%	8.84%	8.11%

Source: net absorption computed by author, data from ONS, Forfas, RICS, Neighbourhood Statistics

Despite the fact that demand growth fell behind supply changes, net absorption was increasing until the recent economic crises with vacancies below the natural level. Intensive tenant activity was boosting rent prices and bubble was generating. Both demand for and supply of commercial space were sharply reduced resulting in net

[22] Net absorption computed as construction completions minus change in vacancies (demolitions omitted as no data was available)
[23] Natural Vacancy computed as a long-term average value

absorption decrease by 6.2 million m^2 and net supply drop by 5.24 million m^2 in the year 2009. Afterwards, values fall far below their pre-crises levels signifying that market did not recover and uncertainty is still persistent. The England[24] commercial space market was the best performing comparing to other nations in early-2000^s. The difference among supply and demand growth was almost insensible driving vacancies below their natural level of 7.46%. Such tendencies lead to undersupply of market resulting in rent price pressures. During the period 2007-2008 as space market was booming leading to high rents inflation and inducing vacancies to rapidly rise by 1.33%. Afterwards, market development was fluctuating: supply was higher in the years 2009 and 2011-2012, while demand grew faster in 2010 and 2013 that altogether lead vacancies to match the natural rate in the last year. Welsh commercial space market was oscillating in the past decade. Annual supply was larger than net absorption of space in 8 out of 10 observations that induced growth in vacancy rate that reached unprecedented value of 8.78% in the year 2013 than exceeded its natural vacancy by 1.85% indicating excess supply on the market. Due to the lagging supply, its responsiveness to weakened tenant activity was not corresponding and constructions initiated in the past were delivered at market. Regarding developments on Scottish commercial space market, oversupply continued until the year 2008 as market was construction industry there was booming faster compared to other nations. Financial meltdown induced decline in vacancies as net absorption growth was higher than annual supply increments in the Scottish market. The situation in Northern Ireland was absolutely different compared with other national commercial space markets. Supply unresponsiveness to demand growth was persistent until the year 2009 resulting in worsened availability and lower rates of vacant stock. During after crises period, demand growth considerably fell behind supply changes leading to sharp increase in vacancy rate at annual margin of 1.3%. The market dynamics had positive trend in the last year: tenant activities matched construction output and vacancy rate declined by 2.06% relative to preceding year.

To sum up, it is apparent that supply and demand forces on the commercial space markets across the UK behave in uncommon patterns, since each market is associated with pitfalls for its further development. Moreover, it was detected that space markets

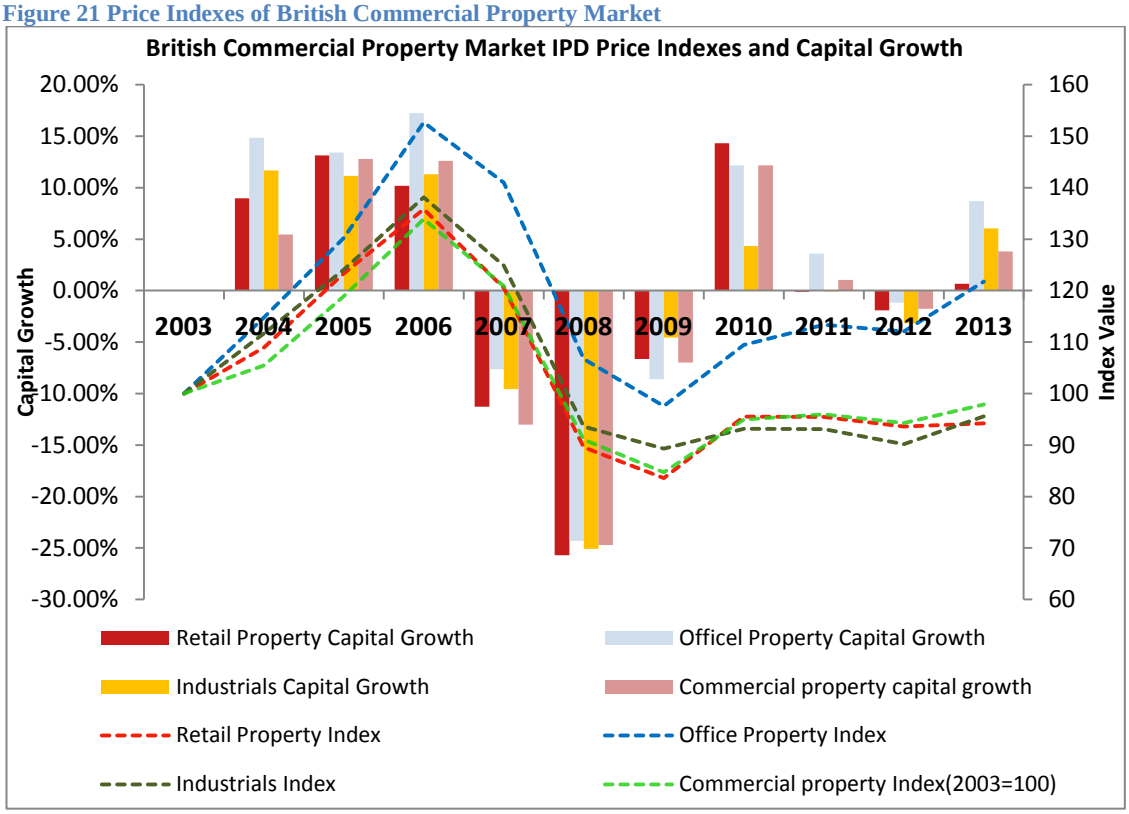
[24] Appendix I: Figures: 37, 38, 39, and 40. Analogical figures computed for England, Wales, Northern Ireland and Scotland.

are rarely on equilibrium as macroenvironment pull demand and supply in different positions that is distinguished by magnitudes of effects.

V.I.IV.II. Price Indicators

As it was discussed before, British commercial space market was low-risk investment, alternative that produced high returns. High investment activity and liberalization on credit markets contributed to robust expansion of the market with capital growth of 33.92% in the year 2006. (Figure 21)

Figure 21 Price Indexes of British Commercial Property Market



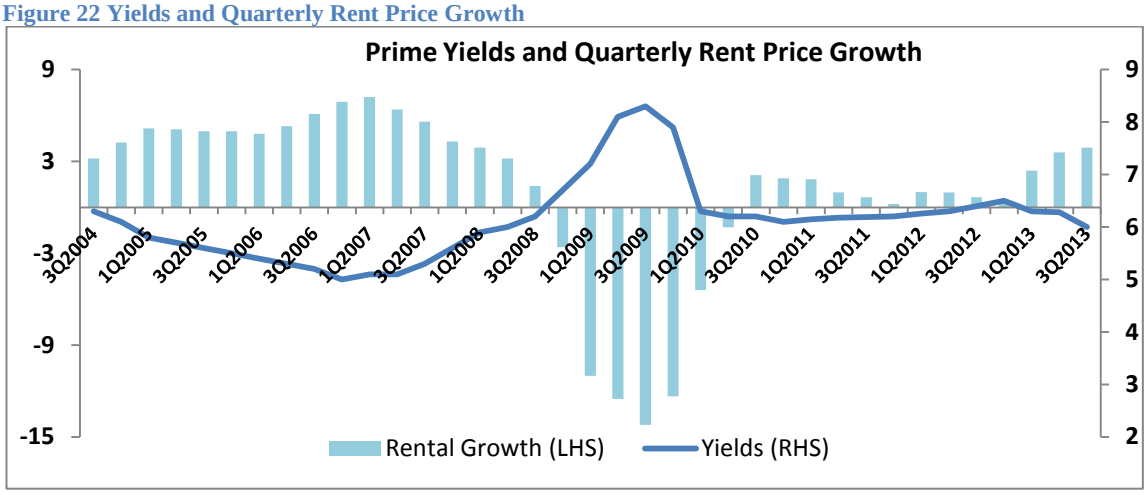
Source: annual change computed by author, index data from Investment Property Databank

Office property was the best performing asset class as its growth constituted 52.65%, while in retail property market and industrial corresponding figures were 35.8% and 38.1%. Evidently, credit crunch, which is associated with weakened demand, lending restrictions and economic misbalance, had an unavoidable impact on asset market. British commercial property prices drop by 13% in the year 2007. However it was only first signs of deepening recession as magnitude of bust accumulated -49.25% from peak to trough. Respective figure for office property was - 55.1%, for retail property it was -52.26% and for industrials -48.8%. By taking into account that unexpected decline in asset values deteriorated financial institutions capital holdings, market dynamics was

worsened and recovery questionable. Thereby, commercial property markets in the UK were still under tension signified by asset values that did not reach even base year figures in the year 2013: industrials were 4.5% behind and retail property gap amounted to 5.8%. However, size of the service sector in the UK economy boosted recovery of office property market, which increment was 21.78% in the year 2013. Therefore, offices were the only asset class that had a stable growth since the year 2009.

Business activity and demographic trends constitute demand for commercial space. Booming economy facilitated by aggregate demand pressures and improved accessibility to credits, resulted in rapid prime rent price inflation with mean increments in its value of 5.2% per quarter or 20.8% per annum, while prime yields were oscillating in a range of 5% to 6%. Unsustainable prime rent inflation generated susceptibility of market to cyclical fluctuation. Economic collapse that induced decline in consumer spending and reduced scale of business operations led the UK commercial space market in deep recession with annual deflation of -50.04% in the year 2009. Notably, yields rapidly increased up to 8% designating rising risks and fall in asset values. British commercial space market recovery was doubtful, since rent price poor growth did not even overreach commodity inflation in the period 2010-2012. However, yields stabilized on the 6.5% in the corresponding period that encouraged investment activity on asset markets. Simultaneously, businesses were stimulated to enlarge outputs that contributed to gradual growth of space market. Figures for the last year suggest optimistic outcomes for the nearest future, since there is observed stable prime rent price growth of 3.3% per quarter.

Figure 22 Yields and Quarterly Rent Price Growth

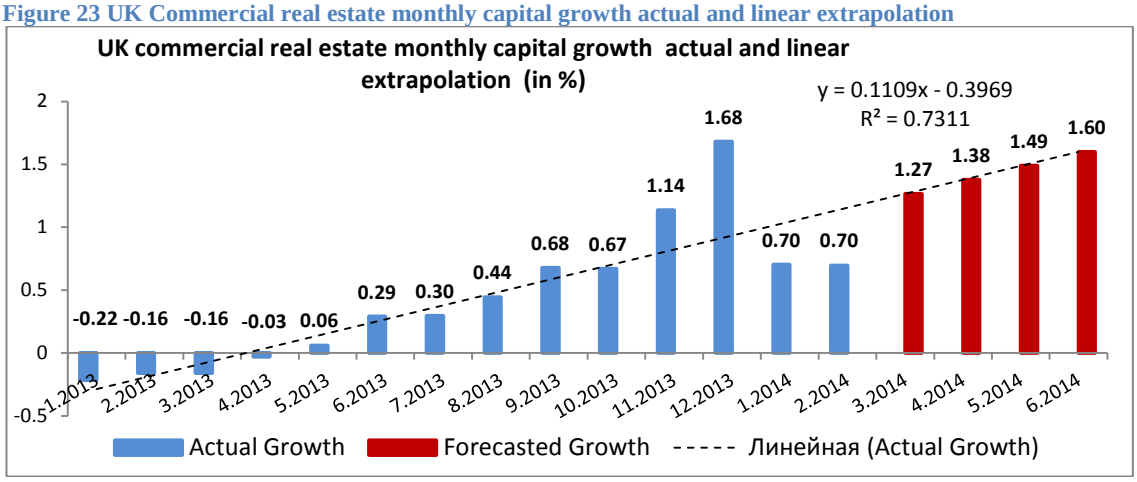


Source: constructed by author based on data selected from CBRE

V.I.V. TREND FUNCTION EXTRAPOLATION FOR FORECASTING

The trend function for the UK commercial real estate capital and income return growth was constructed in order to conduct the forecasting the future trends. With the use the MS Excel programs, it was defined that linear function the best fits the actual dataset. The observation period includes monthly growth of the British commercial real estate rent and capital prices starting from the January 2013 up to recent available data (i.e. February 2014).

Figure 23 UK Commercial real estate monthly capital growth actual and linear extrapolation



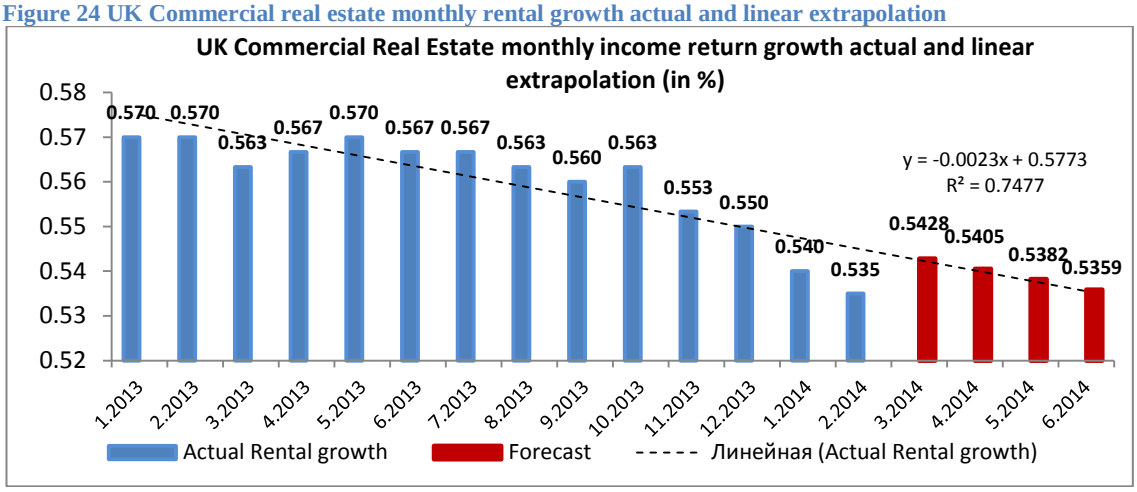
Source: estimation by author, data selected from Investment Property Databank

Regarding the linear extrapolation of the capital growth, the trend function has following specification: y= -0.3969+0.1109x, where x is the number of observation and y is capital growth. As follows, the constant of -0.3989 captured the negative figures in the beginning of observation period. The trend function slope of 0.1109 indicates the positive or increasing trend in the capital growth that increments by 0.11% with every additional observation. The coefficient of determination R^2 is 73.11% designating that there is strong dependence among variables that is 73% of capital growth deviation is explained by the time trend. Based on the trend function, it was forecasted that capital growth will reach 1.27% in March 2014 and continue to increase by 0.11%. (Figure 23)

The income returns extrapolation is derived from corresponding trend function that has form y=0.5773-0.0023x. Thereby, return growth that actually depicts yields has a declining trend with a slope of -0.0023 per month, while value of constant of 0.5773 signifies better performance of commercial space market in the begin of 2013. The trend function well fits model with coefficient of determination of almost 75% denoting that 75% of variations in the yield growth are explained by time trend. According to forecast

assessment, the British commercial property income returns will reach 0.543% in March 2014 and then diminish at month margin of -0.0023%. (Figure 24)

Figure 24 UK Commercial real estate monthly rental growth actual and linear extrapolation



Source : estimation by author, data selected from Investment Property Databank

Considering forecasts for both capital appreciation and yields, it can be deduced that market rents will increase, but on lower growth rate comparing to capital. Since capital is expected to appreciate by 0.11% and yields decline by -0.0023%, the projected growth of market rents will be 0.1077%.

V.II. FEASIBILITY STUDY OF THE OFFICE REAL ESTATE DEVELOPMENT PROJECT IN THE CITY OF LONDON

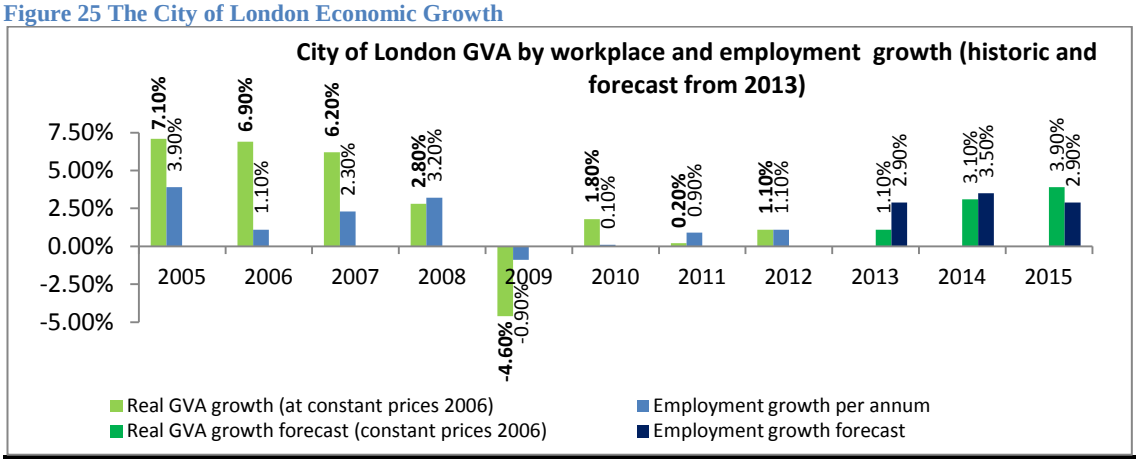
To settle feasibility study, it was selected the office development project of 680000 ft^2 (i.e. 63174 m^2) located on the 20 Fenchurch street, Tower area of the City of London district, London EC3 and possessed by real estate companies Land Securities and Canary Wharf Contractors.[25] Rationales to select a specified site were that office properties are most efficient asset class as they generate highest total returns in the UK and that nearly 64% of London's employed population[26] is engaged in service sector with 30% being directly employed in financial, insurance, legal, business and real estate services. Therefore, the office market development is crucial for economy of London as it influences dynamics of service sector and vice versa. To provide more in-detailed specification of the project, the economic overview and office property market development are captured over district level. (20 Fenchurch Street also referred as project in this thesis)

[25] Information available on 20fenchurchstreet.co.uk
[26] Appendix II: Table 8: London share of employment y sector

V.II.I. ECONOMIC SNAPSHOT

The City of London is a British financial centre with economic growth outperforming the national average[27]. (Figure 25) During the pre-2009 period, output of the City was boosting indicating growing demand on both goods and services markets and labour markets. Thereby, employment was increasing at mean annual rate of 2.63%. During crises, the City drop in GVA was 4.6% in the year 2009 leading to employment fall of almost 1%. As follows, dynamics of commercial property markets in this district was also depicting cycle since both supply and demand forces were adjusting.

Figure 25 The City of London Economic Growth

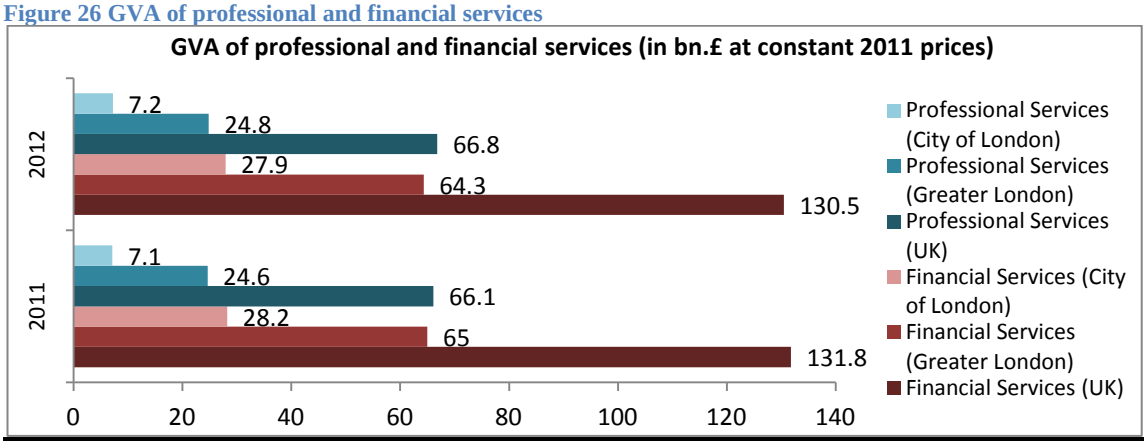


Source: constructed by author, selected data from The City of London Corporation and Oxford Economics

During period 2009-2010, financial constraints inhibited both construction workloads and tenant and investment activities that lead to recession on commercial property market in the City. Recent years, local businesses have been steadily recovering resulting in more stabilized operations on real estate markets. Moreover, projected trends suggest that further expansion of economy is expected inducing growth in commercial property markets. The significance and contribution of the City of London output is emphasized by its value added to the national GVA. Almost 21.4% of the UK financial services are produced within the City of London, while for Greater London output it captures 43.4%. Regarding professional services, their value added amounted to the £7.1 billion that contributed nearly 11% to national figures and nearly 29% to London. (Figure 26)

[27] Appendix II: Figure 41: UK Real GVA annual growth

Figure 26 GVA of professional and financial services

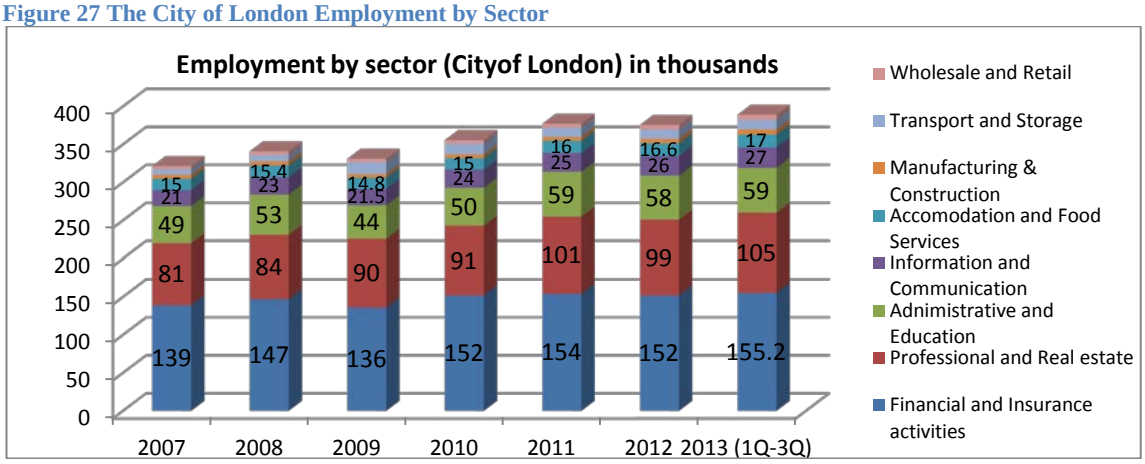


Source: constructed by author, selected data from The City of London Corporation and Oxford Economics

V.II.II. OFFICE SPACE MARKET IN THE CITY OF LONDON

The demand pressures on the office space market in the City of London has been primarily driven by the expansion of financial, insurance, business and real estate services. (Figure 27) Employment figures for the last seven years signify growth in these sectors, with exception of the years 2009 and 2012. The total employment in the City was 389200 persons in the year 2013 with nearly 40% of them engaged in financial and insurance services. The professional and real estate services and administrative and education categories employed 27% and 15% from total amounts, respectively. On the other hand, the smallest share accumulated retail and industrial sectors. Thereby, the employment size reflect dynamics of the commercial space market in the City with office space being the most demanded and, hence, most expensive to let.

Figure 27 The City of London Employment by Sector

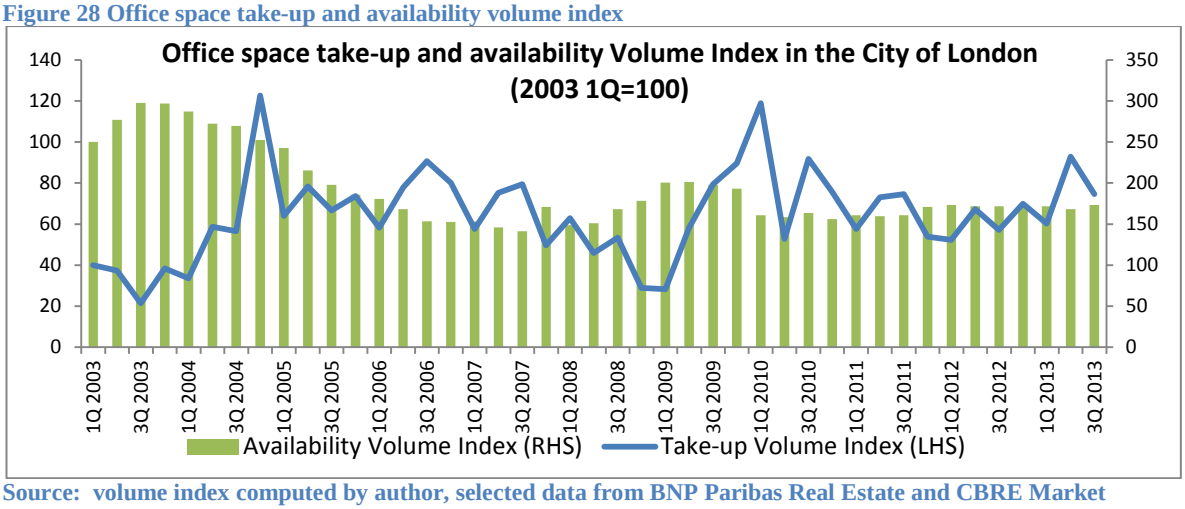


Source: constructed by author, selected data from The City of London Corporation and Oxford Economics

During the last decade office take-ups were deviating on magnitude of almost 100%, the largest increase was observed in the 4thQ 2004 and 1st Q2010, when values tripled and reached 214000 m^2 and 207000 m^2, respectively. (Figure 26) On the other hand, office market was severely affected by credit crunch as accumulated drop by -60% in the 4th Q

2008 and 1st Q 2009 in take-up figures occurred. Recently, demand for the office space in the City was strengthening indicating desirability of location and high competition for the available space. In contrast, supply responsiveness remained questionable as availability of the office space declined by almost 2 times since 3rd Q 2003 and reached 650000m^2 in the 3rd quarter 2013. Thereby, demand pressure and supply lags result in appreciation of rent prices and lower vacancies.

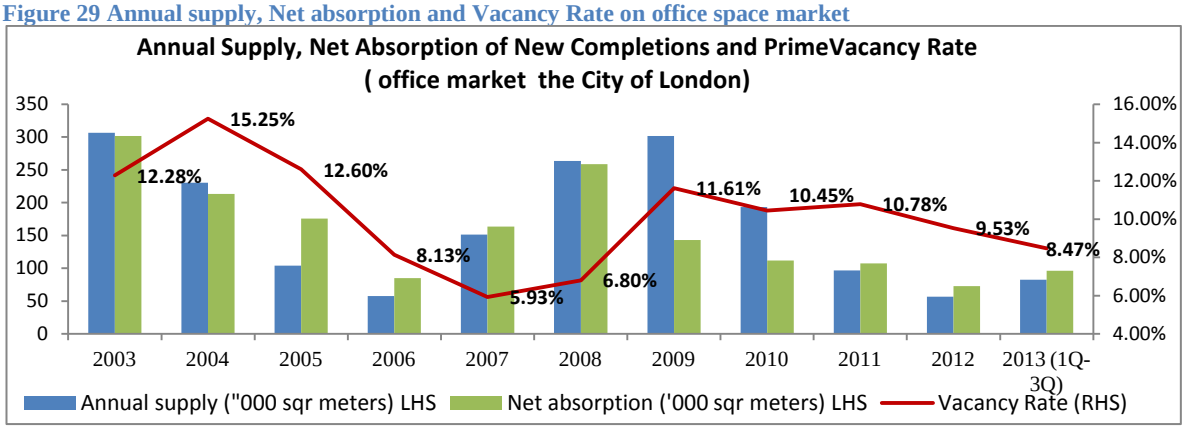
Figure 28 Office space take-up and availability volume index



Source: volume index computed by author, selected data from BNP Paribas Real Estate and CBRE Market Researches

The dynamics of supply of and demand for office space and their consequence on vacancies are depicted in the Figure 29. Accordingly, the supply deficit persisted until the year 2008 as net absorption[28] growth exceeded construction output figures pulling vacancies down to 5.93% that considerably deviate from the 10 year average of 10.17%.

Figure 29 Annual supply, Net absorption and Vacancy Rate on office space market



Source: net absorption computed by author, supply and vacancy data selected from CBRE and BNP Paribas Real Estate Market Researches

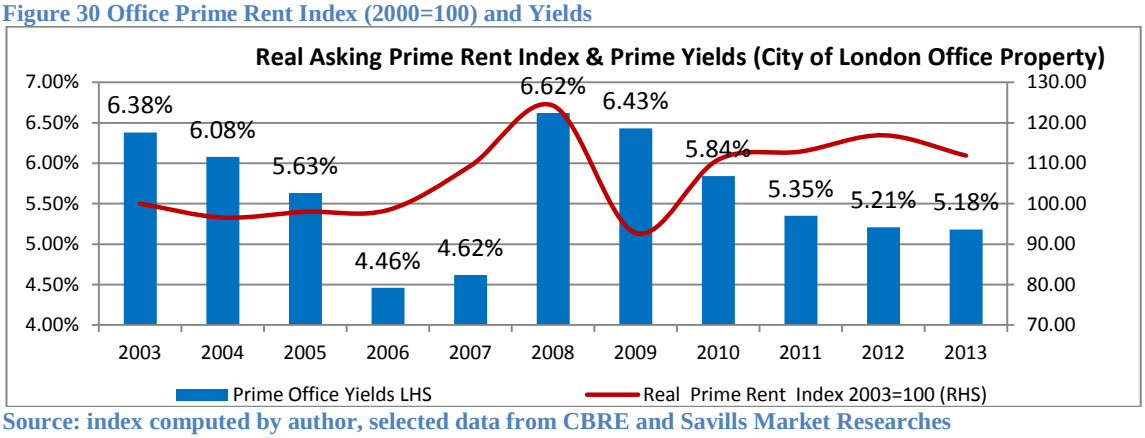
Afterwards, demand cooled down, but supply was continuing delivering stock due to time-lags persisting in construction industry that resulted in rising vacancy rate. Since

[28] Net absorption is computed only for new completions as figures for total stock were not available

the year 2011, demand captures almost all new office space delivered at market leading to decreasing vacancies from 10.78% to 8.47%.

Demand pressure and insensitive supply on the City office space market in the early 2000s resulted in the rent price inflation that generated yield growth. (Figure 30) Since the year 2003 the real rent per m^2 per annum was deviating over 525£ with a magnitude of 10£ until the year 2006, whether yields were decreasing from 6.38% to 4.62% as capital markets were subject to unprecedented growth. As capital markets started experience effects of tightening credit constraints in the year 2008, asset prices were sharply reduced that is reflected in the yield growth of 2%. Real rents were still increasing due to rent stickiness factor. However, the space market also followed pattern of asset market in the year 2009 as real rent prices fall by 30%. Strong demand for office space in the City assured recovery in the next years and real asking prime rents fluctuate over £605 per m^2 per annum. Prime yields in the year 2009 did not change much, thereby it can be deduced that decline in prime office asset prices was lower relative to prime rent prices in space market. Afterwards prime yields were slightly decreased by nearly 1% signifying that recovering in asset markets is faster than on space market.

Figure 30 Office Prime Rent Index (2000=100) and Yields

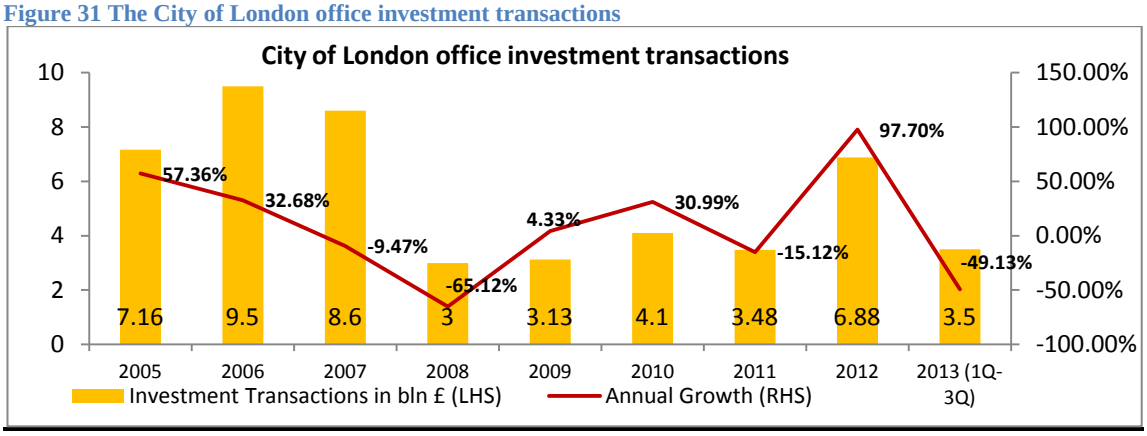


Source: index computed by author, selected data from CBRE and Savills Market Researches

Developments in the City of London office space and asset market discussed above had a direct effect on the investment activity. The amount of transaction was reduced almost three times in the year 2008 as office asset and space markets became insecure investment. Moreover, restrictive policies of the UK banks and uncertainty of economic environment resulted in elevated concerns about riskiness of investing in real property markets. The size of financial meltdown impact on office investment activity in the City of London was considerable as market recovery is still questionable. Obviously, the

situation slightly improved in the recent years, nevertheless the amount of investment transactions far below the pre-crises level. (Figure 31)

Figure 31 The City of London office investment transactions



Source: constructed by author, data from CBRE Market Research

V.II.III. DESIRABILITY OF PROJECT

The overview of local economic trends and office market development in the City of London revealed that construction of new office space is desirable. The recent and forecasted economic growth coupled with increasing employment that is primarily associated with expansion of financial, insurance, real estate and business services will ultimately result in demand tension on the office space market.

Figure 32: 20 Fenchurch Street

Source 20fenchurchstreet.co.uk

Considering supply unresponsiveness, the future construction will balance market and release tension from the rent prices. The 20 Fenchurch Street will provide more 62144 m^2 available space for lease. By taking into account 10.25% vacancy loss, 55774 m^2 will generate more 6972 potential employment with an occupier density[29] of 1 person per 8 m^2.

[29] Occupier density is specified in technical section of 20fenchurchstreet.co.uk

V.II.IV. SITE EVALUATION

V.II.IV.I. Location and Topography

The 20 Fenchurch Street project is located in an attractive district of the City of London. Specifically, this area is famous for being a historical centre of London with ancient constructions that remained from Romans, Anglo-Saxons and Nordic settlements and are subjects to conservation areas.[30] London's Bridge, the Monument to the Great Fire of London, Tower of London, Leadenhall Market, the Fenchurch Railway Station, catholic churches, museums and galleries surrounding the Fenchurch Street make it one of the busiest streets in the City. Not surprisingly, this district is abounded by 95 amenities for restaurants, bar, retail stores and leisure purposes. Moreover, it is financial, legal and insurance centre with 124 corporations residing on the Fenchurch Street and neighbourhood areas[31]. As follows, Fenchurch Street is continuously developed with improvements in infrastructure, transportation routes, public places and built environment. Additionally, sufficient supply of skilled labour force, representational or visual effects and economies of scale in provision and use of services will be available due to agglomeration economies or effect of clustering. To sum up, the Fenchurch Street is preferable area for development projects as it creates a profitable investment opportunity with strategic advantage implicitly possessed by location's potential. (Location map in Appendix II: Figure 42, Figure 43)

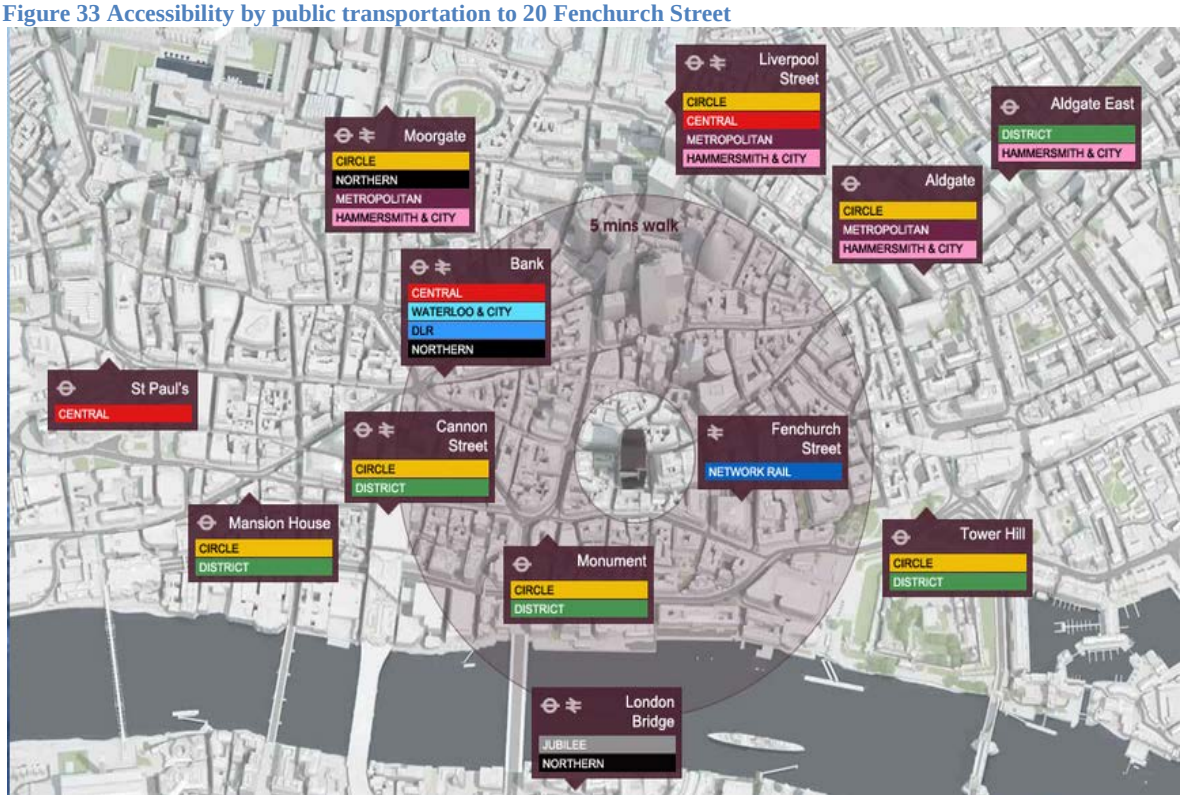
V.II.IV.II. Accessibility

The transportation accessibility to the location is a key factor determining profitability of investment. London has eleven tube lines and all of them are crossing the City area that has more than 10 underground nodes connecting lines with each other. Located in the City core, the 20 Fenchurch Street enjoys relative ease of accessibility with 3 railway stations and 3 underground nodes located in 5 minute walk from the building. More 8 public transport nodes are placed in the neighbouring areas. (Figure 33) Besides, the average cost of travel per day to the City comprise up to 5£[32] that is relatively cheaper compared with out of Central London zones. Considering high density of workplaces and leisure in the City, demand for transportation has been continuously

[30] The City of London Corporation, "Environmental Enhancement Strategies, Fenchurch & Monument Area Strategy" [68]
[31] Appendix II: Figure 45, 46
[32] Appendix II: Figure 44

boosting as amount of tourists, visitors and employees rise. To eliminate overcrowding problem, it was designed seven programs for further enhancement of the transportation schemes, improvement of passenger turnover and reduction of road traffic.

Figure 33 Accessibility by public transportation to 20 Fenchurch Street



Source: 20fenchurchstreet.co.uk

The development of the Fenchurch Street environment and combat of economic externalities such as air, noise and water pollution related to the construction activities and transportation in the City are prioritized tasks of the local authorities. [33] Thereby, the mentioned plans emphasize the importance of the street and its area preference for business activities that actually positively influence the performance of investment

V.II.V. TECHNICAL SUMMARY OF THE PROJECT

The 20 Fenchurch Street development is projected to be 160 meters height 37 floors high-rise office building that will provide 62144m^2 of Class A office space, 1030m^2 of common space and 360 degree view on the City of London. Additionally, parking lots for cars, and detached building for retail space, service personnel room and bikes and bicycles parking will be constructed over adjusted to project area. The project will encompass development of the Sky Garden that will be built upon top levels and will be

[33] The City of London Corporation, Environmental Enhancement Strategies, Fenchurch & Monument Area Strategy [68]

publicly accessible. Thereby, visitors will enjoy panoramic views of the City combined with inspiring landscape garden at one place and absolutely free of charge.

Figure 34: Sky Garden at 20 Fenchurch Street

Source: 20fenchurchstreet.co.uk

To ensure vertical transportation, seven high-rise, seven low-rise and one Sky garden express lifts with capacity of 21 persons will be in charge. The building will contain 60/60 men and woman toilets and 30 unisex toilets for disabled people. Special engineering techniques applied for basement construction will reduce the noise level and vibration from street traffic. Considering security systems, access controls, video monitoring of perimeter and fire protection combined with density of means for escape is 1 per 6 m^2will guarantee safety of tenants. All utility facilities and maintenance service personnel will be located in the first two levels of the building. Despite the standard facilities that building contain, the developer team also focused on the sustainable use of energy by incorporation of solar cells that will be built upon roof and generate renewable energy. The heating and air conditioning system will be based upon combined cooling, heat and power generator that will assure reduction in energy consumption and low carbon dioxide emission. The 20 Fenchurch Street is considered as the most environmentally friendly construction as it was awarded with Gold in the City of London Considerate Awards.[34]

V.II.VI. LOAN AMORTIZATION SCHEDULE

The financial aspect of the 20 Fenchurch Street development includes funding of the construction process. The construction loans are typically funded up to 85%[35] from the

[34] 20fenchurchstreet.co.uk and Canary Wharf Group PLC [42]
[35] Collier N., Collier C., Halperin D.: "Construction Funding: the Process of Real Estate Development, Appraisal and Finance" [4]

total value with proposed development served as collateral. By taking into account the £239 million cost of construction, the loan amortization schedule embracing 85% loan-to-value ratio, 30 year repayment with fixed annual instalments at 6.5% interest rate was developed. The Table 1 depicts the first 15 years of loan amortization, while the full 30-year schedule is available in Appendix II: Table 9. Accordingly, 35850000£ are raised from internal sources and 203150000£ are credited by bank or other lending institution. The fixed interest rate of 6.5% is a 10-year average interest rate[36] of UK lending institutions loans for commercial construction purposes.

Table 1 Loan Amortization Schedule for first 15 years

85% LTC 30-year construction repayment loan schedule at fixed interest Rate 6.5% in £						
Year		Remaining balance at begin (1st year is following= 239mln*0.85)	Interest Expense (Remaining Balance at begin*0.065)	Principal Repayment (Fixed Instalments: 205mln/30)	Debt Service (Interest+ Principal)	Remaining Balance at end (Remaining Balance Begin- Debt Service)
2013	1	203150000	13204750	6771666.667	19976416.67	196378333.3
2014	2	196378333.3	12764591.67	6771666.667	19536258.33	189606666.7
2015	3	189606666.7	12324433.33	6771666.667	19096100	182835000
2016	4	182835000	11884275	6771666.667	18655941.67	176063333.3
2017	5	176063333.3	11444116.67	6771666.667	18215783.33	169291666.7
2018	6	169291666.7	11003958.33	6771666.667	17775625	162520000
2019	7	162520000	10563800	6771666.667	17335466.67	155748333.3
2020	8	155748333.3	10123641.67	6771666.667	16895308.33	148976666.7
2021	9	148976666.7	9683483.333	6771666.667	16455150	142205000
2022	10	142205000	9243325	6771666.667	16014991.67	135433333.3
2023	11	135433333.3	8803166.667	6771666.667	15574833.33	128661666.7
2024	12	128661666.7	8363008.333	6771666.667	15134675	121890000
2025	13	121890000	7922850	6771666.667	14694516.67	115118333.3
2026	14	115118333.3	7482691.667	6771666.667	14254358.33	108346666.7
2027	15	108346666.7	7042533.333	6771666.667	13814200	101575000

Source computed by author

The interest expense vary from year to year dependent on changes in the loan balance at begin of each period, whether principal repayment are fixed at annual instalment of 6771666.7£ as 203.15 millions need to be repaid at the end of the 30th year. The choice of financing option directly impacts the profitability of the investments as debt service determines the level of annual cash flows. The information about amortization schedule will be further employed in the feasibility analysis for study of project performance.

[36] Bank of England

V.II.VII. PRO-FORMA INCOME STATEMENT

The pro-forma income statement was forecasted for the period of fifteen years from 2013 to 2027 and it contains provisional estimates of the future returns derived from investment. The Table 2 encompass income statement for period of first five years, the rest estimates are placed in the Appendix II: Table 10. The forecast values are measured in real terms that are adjusted for inflation at constant 2007 prices. The real prime rent price of Class A office space per $1m^2$ per annum in the City of London was 597.4£[37] in the year 2013. By multiplying this number to the amount of available space for let in 20 Fenchurch Street (i.e. 62144 m^2), it was computed the gross potential income per annum. Next periods the rent price was adjusted by increments of 2.35% on the basis on annual rent review[38] that landlord is entitled. The increment value is a 20 year mean growth of real prime rent prices in the City district[39]. By taking into account natural vacancy loss of 10.25%[40] and operating expenses, it was derived the net operating income. Operating expenses computation involved per square meter annual mean expenses of the office spaces in the City of London. Considering that average industry 10 year expenses increase was 5.06%,[41] annual values for succeeding periods were including a growth factor of 0.51%. Utility expenses are only attributable for common areas as leaseholder covers its use of services. Administrative expenses are subject to economies of scale. Hence, lower margins of mean values were used for computation. The reserve requirement of 3.5%[42] from gross rental income is an accumulated deposit for the replacement of electrical or technical facilities. More detailed information on operating expenses computation is provided in Appendix II. The interest expense was computed for loan amortization schedule and it is deductable item for the taxation purposes. Considering that depreciation expenses cannot be subtracted in income statements in the UK, it was employed a capital and furnishing wear and tear allowances[43] that have differing rates depending upon property specifics.

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[37] CBRE Research Group: "Central London Property Market Review," Q3 2013 [39]
[38] Code for Leasing Business Premises
[39] CBRE Research Group: "Central London Property Market Review," Q3 2013 [39]
[40] Computed as 10-year mean vacancy rate on the prime office space market in the City of London
[41] Jones Lang La Salle, Oscar-2007, Available at < http://www.oscar.joneslanglasalle.co.uk/office/component-service-charges.asp> [53]
[42] Collier N., Collier C., Halperin D.: "Construction Funding: the Process of Real Estate Development, Appraisal and Finance" [4]
[43] HM Revenue & Customs, Capital Allowances [49]

Table 2 Pro-forma Income Statement Forecast for period 2013-2017

Income Statement (loan-financed)	2013	2014	2015	2016	2017
Gross potential income	37124826	37997259	38890195	39804114	40739511
Less Vacancy Loss (10.25%)	-3805294.6	-3894719	-3986244.9	-4079921.7	-4175799.9
Gross income	33319531	34102540	34903950	35724192	36563711
Operating Expenses					
Maintenance Expenses					
Fabric Repair / Maintenance	406626.52	408700.31	410784.68	412879.69	414985.37
Lift& Escalators Maintenance	161248.45	162070.81	162897.37	163728.15	164563.16
Mechanical and Electrical Maintenance	1212868.7	1219054.4	1225271.6	1231520.4	1237801.2
Cleaning& Landscape	511788.55	514398.67	517022.1	519658.91	522309.18
Utility (Common area)					
Water	1371.6642	1378.6597	1385.6908	1392.7579	1399.8609
Electricity	10973.313	11029.277	11085.527	11142.063	11198.887
Gas	3543.4658	3561.5375	3579.7013	3597.9578	3616.3074
Administrative expenses					
Management	273421.28	274815.73	276217.29	277626	279041.89
Site Management	168259.25	169117.37	169979.87	170846.77	171718.09
Security	518799.35	521445.23	524104.6	526777.53	529464.1
Reserve Replacement (3.5% of NOI)	1166183.6	1193588.9	1221638.2	1250346.7	1279729.9
Total Operating Expenses	-4435084.2	-4479160.9	-4523966.6	-4569517	-4615827.9
Net Operating Income (NOI)	**28884447**	**29623379**	**30379983**	**31154675**	**31947883**
Interest Expense	-13204750	-12764592	-12324433	-11884275	-11444117
Net Income Before Tax	15679697	16858787	18055550	19270400	20503766
Wear and Tear Allowances (10% of NOI)	1567969.7	1685878.7	1805555	1927040	2050376.6
Taxable Income	14111727	15172908	16249995	17343360	18453389
Income Tax (23%)	3245697.2	3489768.9	3737498.9	3988972.9	4244279.6
Net Income After Tax	**12434000**	**13369018**	**14318051**	**15281428**	**16259486**

Source: computed by author

At final step, the net income after tax was calculated by reducing the amount of net income before tax by 23% of corporate income tax[44]. The pro-forma income statement provide a first outlook of the investment profitability as it demonstrate whether income generated by a property exceeds expenses associated with interest, taxation, management and operation of building. As follows, net income after tax for the 20 Fenchurch Street is nearly £12.5 million in the year 2013 signifying beneficial investment. The next 15 net incomes after tax are increasing at mean annual margin of 5.68%, while interest expenses are decreasing as loan balance is reduced. However, the more precise assessment involves study of project's capability to cover all debt services including principal repayment, NPV and return analyses. To depict differences that

[44] HM Revenue& Customs [50]

financing decision has on profitability of investment, it was also computed net income after tax in case of fully self-financed project development. (Table 3) The only differing part of income statement is represented. Since interest expense is no more deductable, income tax is almost 2.5 times higher, while net income almost doubled. However, the mean growth rate of net income in self-financed investment is nearly 2.5% per annum that is far below the corresponding value of the loan-financed case.

Table 3 Income Statement for self-financed investment (only differing part)

Income statement (self-financed)	2013	2014	2015	2016	2017
Net Operating Income (NOI)	28884446.8	29623379.08	30379983.01	31154675.5	31947883.06
Wear and Tear Allowances (10% of NOI)	2888444.68	2962337.908	3037998.301	3115467.55	3194788.306
Taxable Income	25996002.1	26661041.17	27341984.71	28039207.9	28753094.76
Income Tax (23%)	5979080.49	6132039.47	6288656.484	6449017.82	6613211.794
Net Income After Tax	22905366.3	23491339.61	24091326.53	24705657.6	25334671.27

Source: computed by author

V.II.VIII. INVESTMENT RATIOS ANALYSIS

V.II.VIII.I. Performance indicators

Investment ratios were computed by employing data from the income statements and loan repayment schedule. It was also measure the approximate value of asset based on the market initial yield, which is actually used in the UK instead of the cap rates.[45] Since the year 2008, initial yield of office space is was fluctuating range from 6% to 7%.[46] Thereby, the asset value was computed for three scenarios. In the year 2013, the market asset price is approximately 177628565£ at worst case and 207233326£ in the best case. Afterwards, it increases at the same increment as net operating income. The Debt Service Coverage Ratio (DSCR) indicates whether or not the net operating income, which is generated by property, is sufficient to cover all liabilities associated with loan repayment. Considering that loan is amortized over 30 years, the NOI exceeds the debt services by 1.45 in the first year denoting that investment is sustainable and efficient. Moreover, DSCR diminishes with every additional year of holding 20 Fenchurch Street as NOI increases and debt services declines. Notably, the NOI is almost three times higher than debt services in the 15th year of investment. Regarding Gross Rent Multiplier (GRM), it is 5.56 in the first year pointing out that six years will be needed for property to accumulate the asset value at best scenario of 6% initial yield.

[45] Hungria-Garcia R. et al: "Property yield as tool for valuation and analysis" [27]
[46] Henderson Global Investors [46]

By taking into account that 20 Fenchurch Street is completely new Class A office building located in the high densely area, it has a great performance as its potential rental stream is only six times lower than asset value. The next 15 years, GRM slightly increases signifying that asset value grows at faster rate than rent prices. The payback period of project indicates that at current net income the project will be recouped at 10.4 year period that is ten and half years will be needed to accumulate the amount of initial investment. According to Break-Even Ratio (BER), cash outflows associated with operating expenses and debt services constitute 73.26% from cash inflow that project produces in the year 2013 and then it decreases to 41.06% in the year 2027, what evince the liquidity as extra-cash inflow back up investment in case of incurred expenses and market or economy volatility.

Table 4 Projected investment ratios for period 2013-2017 in case of loan-financed investment

Loan-financed		2013	2014	2015	2016	2017
Market value at differing initial yields=> Market value=NOI/initial yield	0.07	177628565	190985973.7	204543588	218306108	232278378.4
	0.065	191292301	205677202.4	220277710.2	235098886	250145946
	0.06	207233326	222816969.3	238634186	254690459	270991441.5
DSCR		1.45	1.52	1.59	1.66	1.75
GRM		5.5820	5.8640	6.1361	6.3985	6.6518
BER		73.26%	70.42%	67.67%	65.01%	62.44%
Cash Flow ROI		15.79%	18.04%	21.05%	23.74%	26.47%
Net Income ROI		12.46%	15.07%	17.72%	20.40%	23.13%
Total ROI			37.29%	39.94%	42.63%	45.35%
Payback Period		10.4 years				

Source computed by author

Turning to return analysis, the cash flow return on investment is 15.79% determining that approximately one quarter of initial investment of 35850000£ is repaid in the first year of asset holding. Moreover, it indicates that at every 1£ invested in 20 Fenchurch Street, 0.16£ is produced. Thereafter the cash flow ROI increases at annual growth rate of 3%, and more than 59% of the initial investment cash will be derived in the year 2027. Cash flow ROI is more preferable to employ in analysis than net income ROI as it defines real cash generated by property and omits non-cash figures. However it is still worth to examine the latter ratio. The net income return on investment incorporates depreciation expense, which was estimated by employing straight-line depreciation method, and amount to 7966666£[47] per annum. Net income ROI is 12.46% in the year 2013 expressing that project yields 0.125£ of net income at every pound invested in it.

[47] Cost of construction over 30 year of holding

The final ratio, total ROI captures not only the intrinsic capability of project, but also market tendencies of capital growth. For the 2nd year, the aggregate figure for income return, capital appreciation and equity enlargement is 37.29% from the initial investment value, whether in the 15th year the ratio reaches almost three quarter value. Therefore, total returns figures suggest that project is profitable in both dimensions as asset and rental stream. Comparing with national office market's income and total returns of 5.7% and 14.75%, respectively, it is obvious that project has potential for strong performance magnifying each year.

Analogical computations were provided for the case of self-financed investment. (Table 5) The asset prices are 1.8 times higher comparing to the first case, reflecting that NOI in the self-financed scenario outreaches the NOI in loan-financed investment. As a result, the GRM is nearly double of the corresponding figure in the first case. The projected value for 1st year denotes that gross potential income is 10.3 times lower than estimated market value of asset. Next years the ratio increases at annual increment of 0.02 that signifies slightly faster growth of capital relative to rent prices. However, in this case the 20 Fenchurch Street will be repaid back much faster that is during first 6.4 years. As investment is self-financed, there are no costs associated with loans leading to comparatively low BER of 13.31%, which declines succeeding periods. Thereby, cash outflows associated with real property operating activities is approximately one tenth of the cash inflows generated that denotes sustainable efficiency of the project.

Table 5 Projected investment ratios for period 2013-2017 in case of self-financed investment

Self-financed		2013	2014	2015	2016	2017
Market value at differing initial yields=> Market value=NOI/initial yield	0.07	327219519	335590565.9	344161807.6	352937966	361923875.3
	0.065	352390251	361405224.8	370635792.8	380087041	389764173.4
	0.06	381756105	391522326.9	401522108.8	411760961	422244521.2
Cash Flow ROI		10.79%	11.07%	11.35%	11.64%	11.94%
GRM		10.283041	10.30396237	10.32450758	10.3446834	10.36449659
BER		13.31%	13.13%	12.96%	12.79%	12.62%
Income ROI		6.25%	6.50%	6.75%	7.00%	7.27%
Total ROI			9.83%	10.08%	10.34%	10.60%
Payback Period		6.4 years				

Source: computed by author

By taking into account the £239mln cost of construction, project's returns are far below respective figures in the previous case. Self-financed project yields 0.107£ of cash and 0.062£ of net income at every pound invested that is 5% and 6%, respectively, below

the first case ratios. Afterwards, both returns appreciate by 0.28% and 0.25%. The estimated total ROI in the year 2014 is 9.83% with annual growth of 0.26% that emphasizes the benefits of investment in terms of capital appreciation and rent growth. Even though the returns are relatively low, income ROI and total ROI still exceed national average figures. Moreover, higher returns are associated with higher risks as rent or asset prices might reach unsustainable levels resulting in breakdown.

V.II.VIII.II. Internal Rate of Return and Net Present Value Analysis

The discussed above investment performance ratios do not capture the time value of future rental streams in terms of current pound value. In order to settle this issue, it was employed the Net Present Value analysis that involves the essentials of feasibility study and determines whether benefits of investment outreaches costs. The NPV was estimated for three scenarios: sale of project after 5/10/15 years of holding. The Table 6 depicts discounted cash flows at present value interest factor of 10[48]% for each period and scenario. For the loan-financed scenario, the asset sale price was adjusted by loan balance that was not amortized yet. Therefore, the NPV for the loan-financed investment in case of disposal after 5 years is 49379482.29£ indicating that at current money value the benefits from asset holding exceed initial costs by specified amount. Moreover, the NPV for 10 and 15 holding periods increases up to 100703182.7£ and 125308163.1£, respectively, as loan balance and interest expense decline inducing higher asset value. Considering the self-financing option, the NPV is 98392484.1£ that is almost 2 times higher than in previous case due to the higher asset value and omission of its adjustment. For other two scenarios, project accumulates 89392924.38£ and 60651330.51£, respectively, that is below than in 5 year period. This tendency emerges because of increasing discounting factor with number of years that reduces current value of every pound earned in future. Despite the fact that diminishing returns persist in self-financed option, it is deduced that 20 Fenchurch Street generate higher than minimal expected return of 10% what strengthen its attractiveness and financial viability.

The internal rate of return (IRR) was derived with the use of MS Office programme for given three periods of asset holding. For the loan-financing option the IRR is 35.3% in 5-year plan indicating that at this discounting rate the present value of cash inflows will be equalized to initial cash outflow. Considering that loan was obtained at 6.5%, it is

[48] Minimum expected rate of return

obvious that project is capable to cover cost of financing. Project will yield IRR of 32.3% and 29.30% in 10 and 15-years that reflect effect of discounting future cash flows at longer periods. At the second option of self-financing, the IRR is 19% for 1st time period scenario that is 16%. Afterwards, IRR also diminishes and reaches 14.8% in 10-year period and 13.5% in 15-year. The IRR for second case is much less relative to loan-financing option evolved by initial cash outflow that is cost of construction.

Table 6 NPV and IRR at different cash-flow schedules

	PV of cash flows at discounted interest factor of 10% (loan financed)			PV of cash flows at discounted interest factor of 10% (self-financed)		
	Exit at year 5	Exit at year 10	Exit at year 15	Exit at year 5	Exit at year 10	Exit at year 15
Initial Cash outflow	-35850000	-35850000	-35850000	-239000000	-239000000	-239000000
Cash Inflow 1	5147575.37	5147575.368	5147575.368	20823060.3	20823060.29	20823060.29
Cash Inflow 2	5452356.88	5452356.878	5452356.878	19414330.3	19414330.26	19414330.26
Cash Inflow 3	5669710.11	5669710.114	5669710.114	18100170.2	18100170.2	18100170.2
Cash Inflow 4	5812281.19	5812281.194	5812281.194	16874296.6	16874296.59	16874296.59
Cash Inflow 5	63147558.2	5891189.844	5891189.844	168264364	15730837.6	15730837.6
Cash Inflow 6		5916199.343	5916199.343		14664306.63	14664306.63
Cash Inflow 7		5895868.289	5895868.289		13669577.5	13669577.5
Cash Inflow 8		5837685.218	5837685.218		12741861.23	12741861.23
Cash Inflow 9		5748189.937	5748189.937		11876684.25	11876684.25
Cash Inflow 10		85182126.55	5633081.721		184497799.8	11069867.99
Cash Inflow 11			5499382.847			10317509.74
Cash Inflow 12			5345186.297			9615964.746
Cash Inflow 13			5180409.641			8961829.439
Cash Inflow 14			5006185.514			8351925.71
Cash Inflow 15			83122860.93			129721436.8
NPV	49379482.29	100703182.7	125308163.1	98392484.1	89392924.38	60651330.51
IRR	35.30%	32.30%	29.30%	19.00%	14.80%	13.50%
Risk spread	3.01%	7.59%	14.62%	0.29%	0.70%	1.02%

Source: computed by author

Based on the total returns it was computed risk spread. As follows, risks of investing in 20 Fenchurch Street for loan-financed option is above than self-financed option as total returns in former case deviates at larger margins than in latter one. Notably, risk annualized over 5 year is 3.01% in 1st case and 0.29% in the second. Hence, self-financed investment provides more stable returns and there is less susceptible to failure. Afterwards both values increase up to 14.62% and 1.02%, respectively denoting higher risks imposed at larger time scales emerging from volatility in returns. At last, it cannot be ultimately stated that project should be disposed after 5 years due holding as there was clear evidence of projects' potential to generate returns at increasing trend.

VI. Conclusion and Recommendation

This diploma thesis provided economic analysis of the British commercial real estate markets incorporating studies of macro-and micro-economic indicators and their effect on markets' dynamics. Furthermore, it involved time series analysis of income-producing real properties market dynamics combined with comparison studies across the UK constituent countries. Forecast model was designed based on trend analysis comprising of linear extrapolation. Furthermore, feasibility study of the commercial project in the City of London was settles that encompassed examination of local office market, investment analysis and studies of location, accessibility and financial viability of the project.

Based on the research it was derived that commercial real estate markets across the UK constituent countries experienced boom-bust episode during last decade, which was facilitated by the financial meltdown and double-dip recession. Recent periods, they are gradually recovering. However, full recovery is still questionable as volatilities in markets' dynamics persist. Accordingly, the UK commercial real estate markets went from the state of being one of the most secure investments with strong performance in terms of returns to the state of collapse and deprivation with riskiness of investment in it and deviations of returns on high margin. Regarding developments on submarket level, British office property market was the most performing and efficient asset class as it generated highest total returns, which was fostered by great expansion of service sectors of economy. The retail property market was least profitable, while industrials were the most stabilized commercial asset class in the post-crises period. As follows, investments in offices were the most risky option, whether industrials were relatively secure with stable returns. Moreover, the study revealed that main factors inducing susceptibility of commercial real estate markets to bubble-burst scenarios were financial regulations of UK banks, supply unresponsiveness driven by construction lags and high desirability of certain areas, and investors' unconcern about cyclical nature of real estate markets. The lending restrictions induced investors and constructors to shrink their operations. Thereby, constructions outputs and demand for space abruptly declined across UK countries in the year 2009. Considering regional fragmentation of real estate markets, different patterns of behaviour was detected across UK constituent countries. Oversupply associated was persistent on the Scottish commercial property market

resulting in rising vacancies and availabilities. However, the sharp reduction in construction volumes resulted in declining vacancies as demand decreased at lower rates in the post-crises periods. Welsh commercial real estate markets had an excess supply with construction outputs exceeding absorption rates. In contrast, undersupply and strong demand for rentable space was detected in Northern Ireland commercial real estate market with declining vacancy rates during last decade, with exception of recession periods, while in England almost all new stock delivered at market was captured by tenants indicating strong demand for commercial space. By taking into account implications of supply and demand forces on prices, the weakened demand for both commercial assets and space resulted in rapid decline of capital growth and rent prices. During post-crises period, markets were struggling to recover. As follows, improvement was detected in the year 2013 signifying optimistic outcomes. Furthermore, the trend analysis suggests that commercial capital growth is expected to appreciate in the year 2014, while yields will slightly diminish. Correspondingly, it was deduced that rent prices are also projected to increase but at lower rates than asset prices.

The feasibility study of the 20 Fenchurch Street proved that office developments are desirable in the City of London district as employment growth in occupiers, those are legal, financial, insurance and business service companies, has been strengthening. The site location is characterized by perfect transportation accessibility and high density of visitors. For the loan-financed option, it was proved that project is financially viable and self-sustainable. Being profitable investment it will generate returns at increasing margin per annum. At last, it was deduced that project is feasible since income derived from its operation exceed costs of construction. The approximate payback period of project was estimated to be 10.5 years.

Recommendations

- As recent practice on financial markets demonstrated, UK banks should be more concern with loan approvals, creditworthiness of borrowers and loan securitization. Moreover, they should establish policies that will be balanced among liberalization and tightening regulations resulting in less volatile real estate markets.
- The British commercial property markets have been historically susceptible to bubbles. Therefore, both investors and constructors should bear it in their minds and

be more cautious while making their decision that should be based upon not only past and current trends, but also future projections.

- The supply responsiveness in regions of the United Kingdom was relatively weak that induced booming commercial property markets as demand pressure persistent. Accordingly, local authorities should design strategies in enhancing economic power and attractiveness of other regions by providing more job opportunities and tax or loan availability incentives.
- Regarding feasibility study of 20 Fenchurch Street, it would be recommended to select a loan-financing option, since project generates higher cash flows and returns relative to self-financed investment.

Limitations of the research

- The main factor constraining research was accessibility to data. Considering that there is no single database on commercial real estate markets developments in the UK. The data was collected from different sources. Since it was not compatible in some cases, as various methodologies were used, it had to be omitted. Moreover, data was not always available at regional or sector-specific level leading to limitations in analyses.
- Regarding feasibility study, the estimates were only provisional and conducted under assumption.

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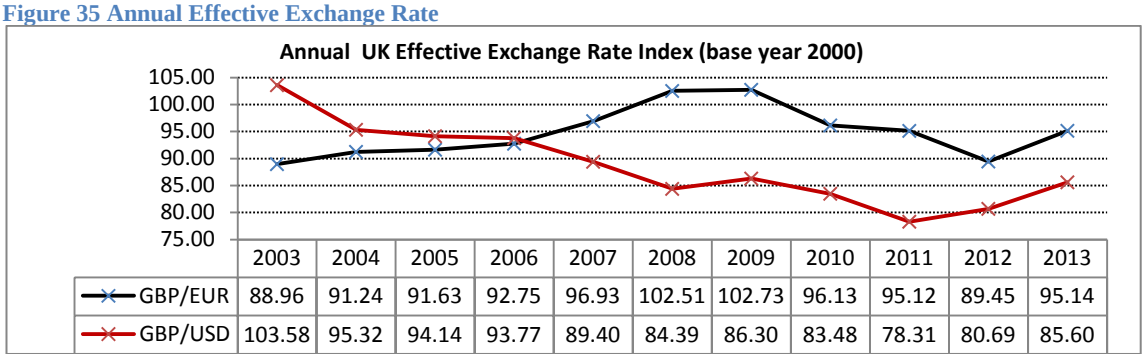
VIII. Appendix I

Table 7 Distribution of the net migration among UK constituent countries

Distribution of Net Migration Across UK Constituent Countries										
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Scotland	10.41%	13.63%	9.44%	15.41%	13.26%	13.55%	11.27%	12.06%	5.84%	7.34%
Wales	8.33%	3.77%	4.82%	5.69%	4.97%	3.27%	1.04%	2.79%	0.92%	6.21%
England	80.26%	79.62%	82.29%	74.58%	78.40%	81.26%	87.47%	85.84%	94.05%	88.70%
NI	1.01%	2.98%	3.45%	4.32%	3.37%	1.93%	0.23%	-0.70%	-0.81%	-2.26%
UK	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

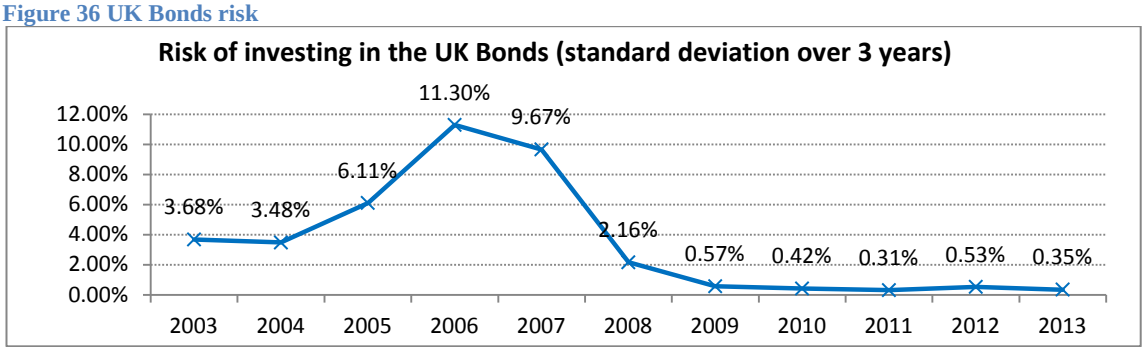
Source: own computation based on data from ONS, NISRA, StatWales, Scottish Government

Figure 35 Annual Effective Exchange Rate



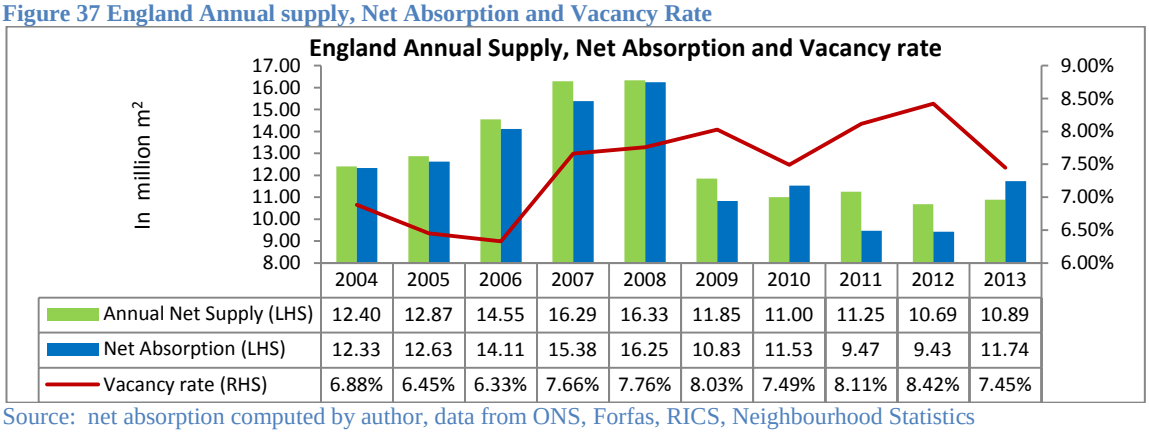
Source: Constructed by author, selected data from Bank of England

Figure 36 UK Bonds risk



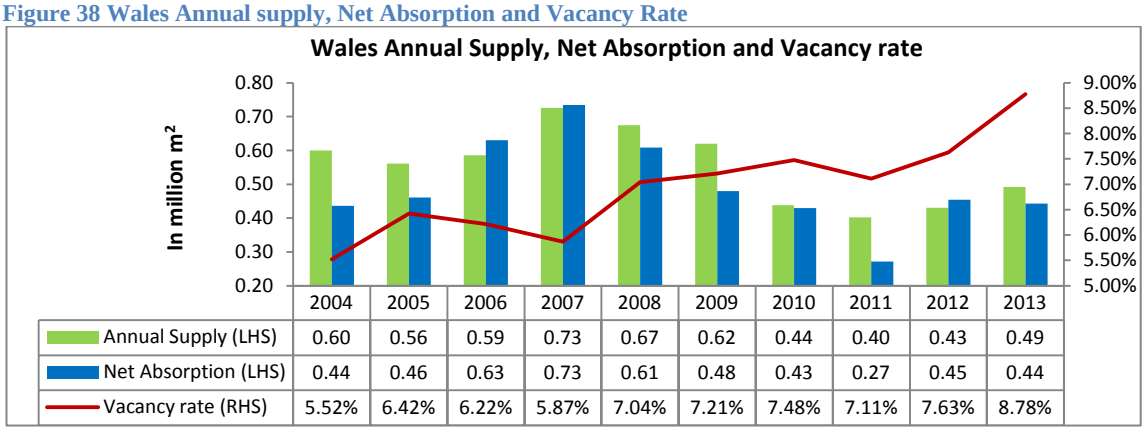
Source: Computed by author based on data from Bank of England

Figure 37 England Annual supply, Net Absorption and Vacancy Rate



Source: net absorption computed by author, data from ONS, Forfas, RICS, Neighbourhood Statistics

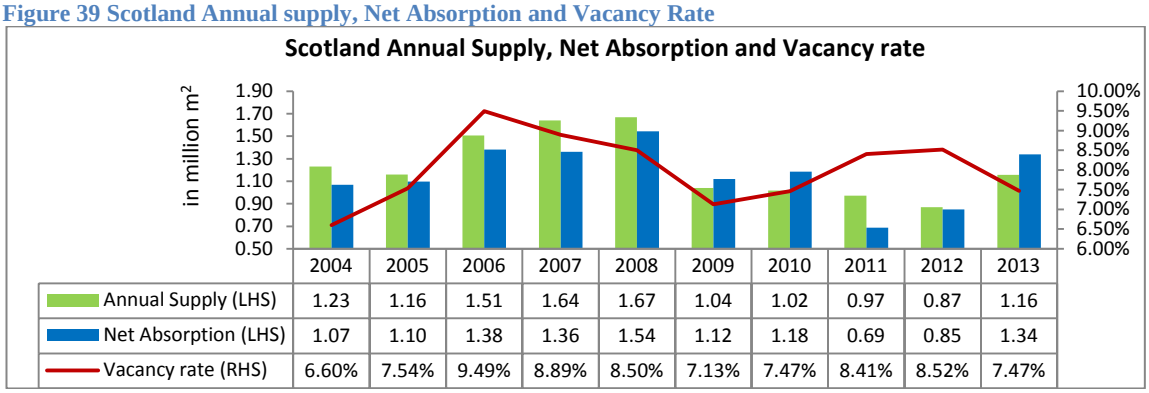
Figure 38 Wales Annual supply, Net Absorption and Vacancy Rate



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Annual Supply (LHS)	0.60	0.56	0.59	0.73	0.67	0.62	0.44	0.40	0.43	0.49
Net Absorption (LHS)	0.44	0.46	0.63	0.73	0.61	0.48	0.43	0.27	0.45	0.44
Vacancy rate (RHS)	5.52%	6.42%	6.22%	5.87%	7.04%	7.21%	7.48%	7.11%	7.63%	8.78%

Source: net absorption computed by author, data from ONS, Forfas, RICS, Neighbourhood Statistics

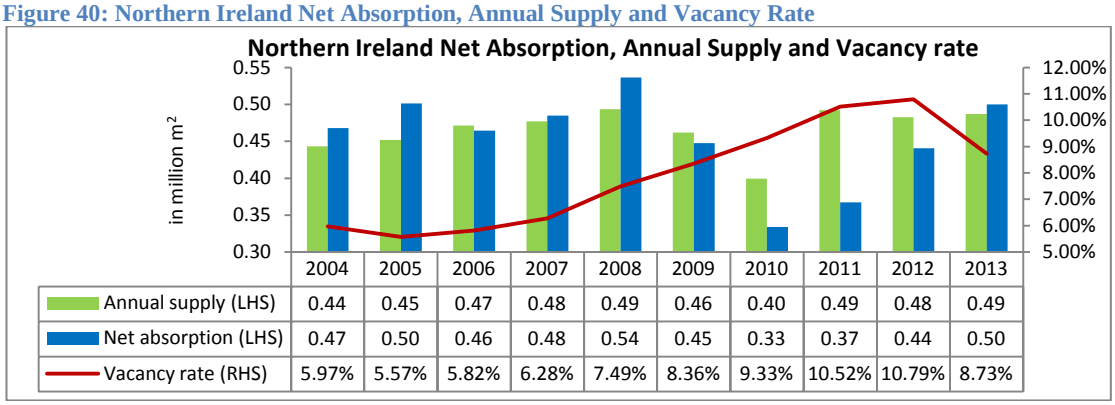
Figure 39 Scotland Annual supply, Net Absorption and Vacancy Rate



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Annual Supply (LHS)	1.23	1.16	1.51	1.64	1.67	1.04	1.02	0.97	0.87	1.16
Net Absorption (LHS)	1.07	1.10	1.38	1.36	1.54	1.12	1.18	0.69	0.85	1.34
Vacancy rate (RHS)	6.60%	7.54%	9.49%	8.89%	8.50%	7.13%	7.47%	8.41%	8.52%	7.47%

Source: net absorption computed by author, data from ONS, Forfas, RICS, Neighbourhood Statistics

Figure 40: Northern Ireland Net Absorption, Annual Supply and Vacancy Rate

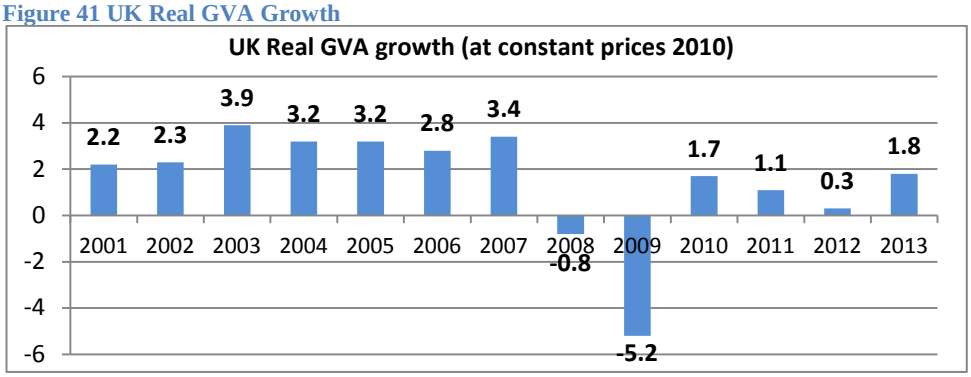


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Annual supply (LHS)	0.44	0.45	0.47	0.48	0.49	0.46	0.40	0.49	0.48	0.49
Net absorption (LHS)	0.47	0.50	0.46	0.48	0.54	0.45	0.33	0.37	0.44	0.50
Vacancy rate (RHS)	5.97%	5.57%	5.82%	6.28%	7.49%	8.36%	9.33%	10.52%	10.79%	8.73%

Source: net absorption computed by author, data from ONS, Forfas, RICS, Neighbourhood Statistics

Appendix II

Figure 41 UK Real GVA Growth



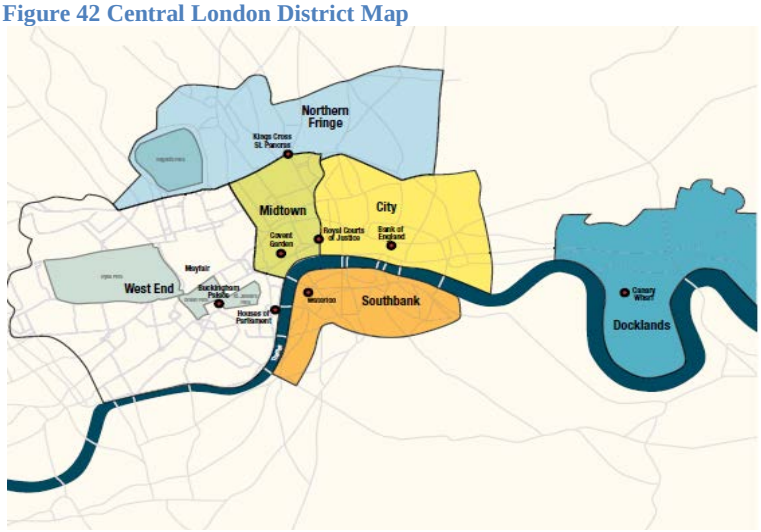
Source: constructed by author, selected data from ONS

Table 8 London Employment Share by Sector

	2007	2008	2009	2010	2011	2012	2013
A : Agriculture, forestry and fishing	0.07%	0.13%	0.04%	0.06%	0.04%	0.06%	0.06%
B : Mining and quarrying	0.07%	0.08%	0.13%	0.15%	0.10%	0.04%	0.09%
C : Manufacturing	4.07%	3.67%	3.48%	3.48%	3.22%	2.68%	2.34%
D : Electricity, gas, steam and air conditioning supply	0.11%	0.08%	0.13%	0.15%	0.14%	0.12%	0.11%
E : Water supply; sewerage, waste management and remediation activities	0.35%	0.36%	0.36%	0.29%	0.34%	0.35%	0.37%
F : Construction	5.00%	5.21%	5.40%	5.28%	5.51%	4.81%	5.45%
G : Wholesale and retail trade; repair of motor vehicles and motorcycles	13.78%	13.47%	13.30%	13.09%	12.57%	12.38%	11.25%
H : Transportation and storage	5.59%	5.66%	5.46%	5.57%	5.69%	5.56%	5.12%
I : Accommodation and food service activities	6.78%	6.74%	6.66%	6.61%	6.64%	6.35%	6.80%
J : Information and communication	6.96%	7.03%	7.40%	7.38%	7.50%	7.07%	7.21%
K : Financial and insurance activities	7.43%	7.10%	7.17%	7.35%	7.34%	7.07%	7.02%
L : Real estate activities	1.59%	1.69%	1.77%	1.86%	1.89%	2.23%	2.71%
M : Professional, scientific and technical activities	10.65%	11.14%	11.42%	11.97%	11.99%	12.69%	13.26%
N : Administrative and support service activities	9.89%	9.85%	9.97%	10.42%	9.92%	9.36%	10.07%
O : Public administration and defence; compulsory social security	5.43%	5.53%	5.27%	4.91%	4.69%	5.20%	4.24%
P : Education	6.63%	6.50%	6.45%	6.48%	6.48%	7.47%	7.34%
Q : Human health and social work activities	8.96%	9.17%	8.81%	8.20%	9.25%	10.22%	10.27%
R : Arts, entertainment and recreation	3.15%	3.22%	3.48%	3.40%	3.56%	3.08%	3.18%
S : Other service activities	2.85%	2.84%	2.72%	2.82%	2.59%	2.79%	2.75%
T : Activities of households as employers; undifferentiated goods-and services-producing activities of households for own use	0.61%	0.53%	0.59%	0.54%	0.52%	0.46%	0.34%

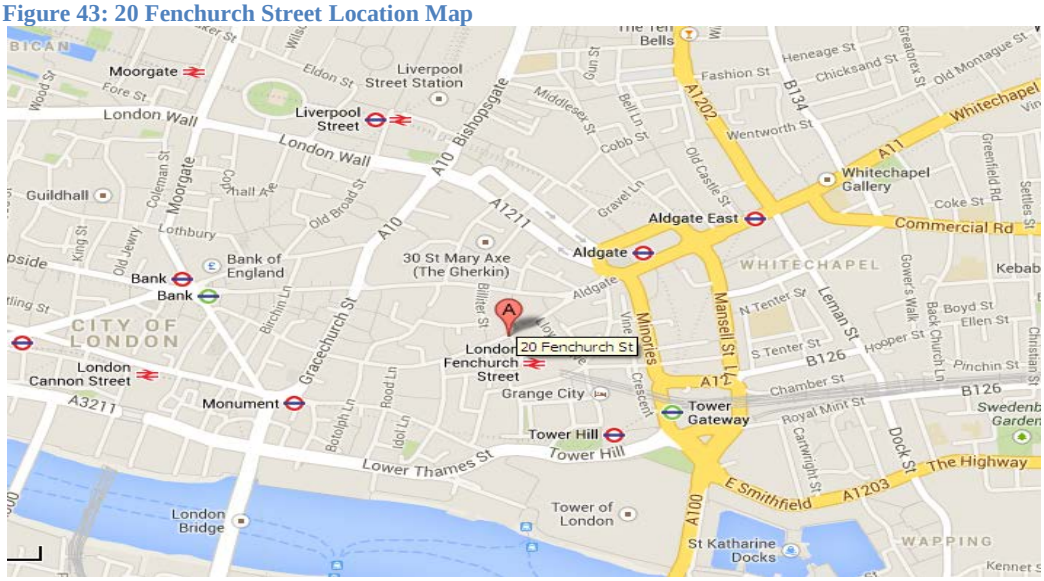
Source share computed by author, data from Official Labour Market Statistics

Figure 42 Central London District Map



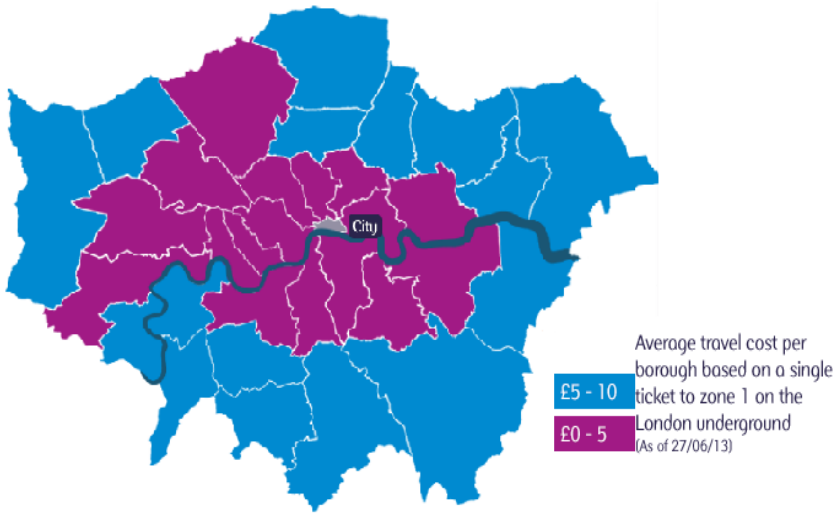
Source BNP Paribas Real Estate

Figure 43: 20 Fenchurch Street Location Map



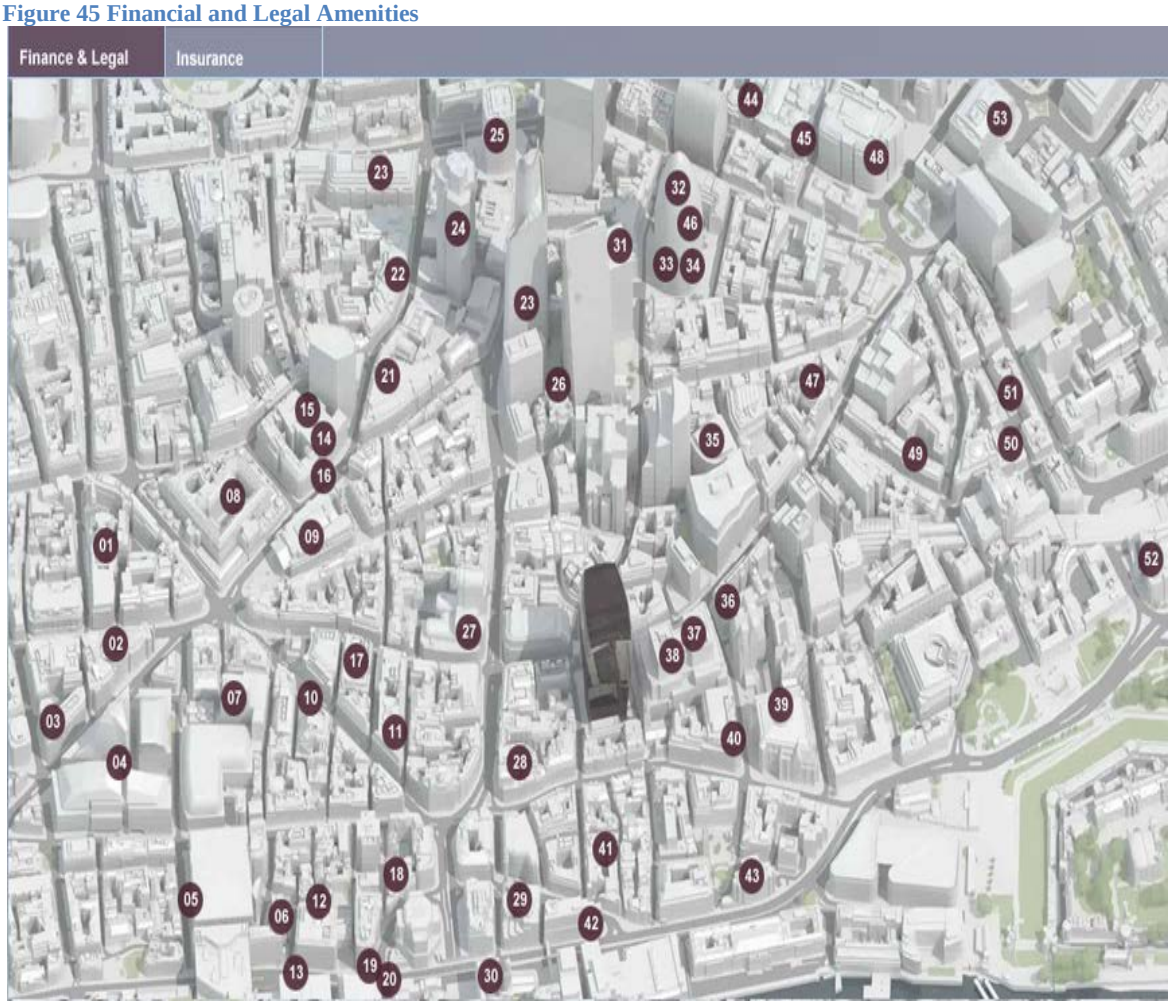
Source: Google Maps

Figure 44 Average cost of travel per day



Source NatWest Helpful Banking

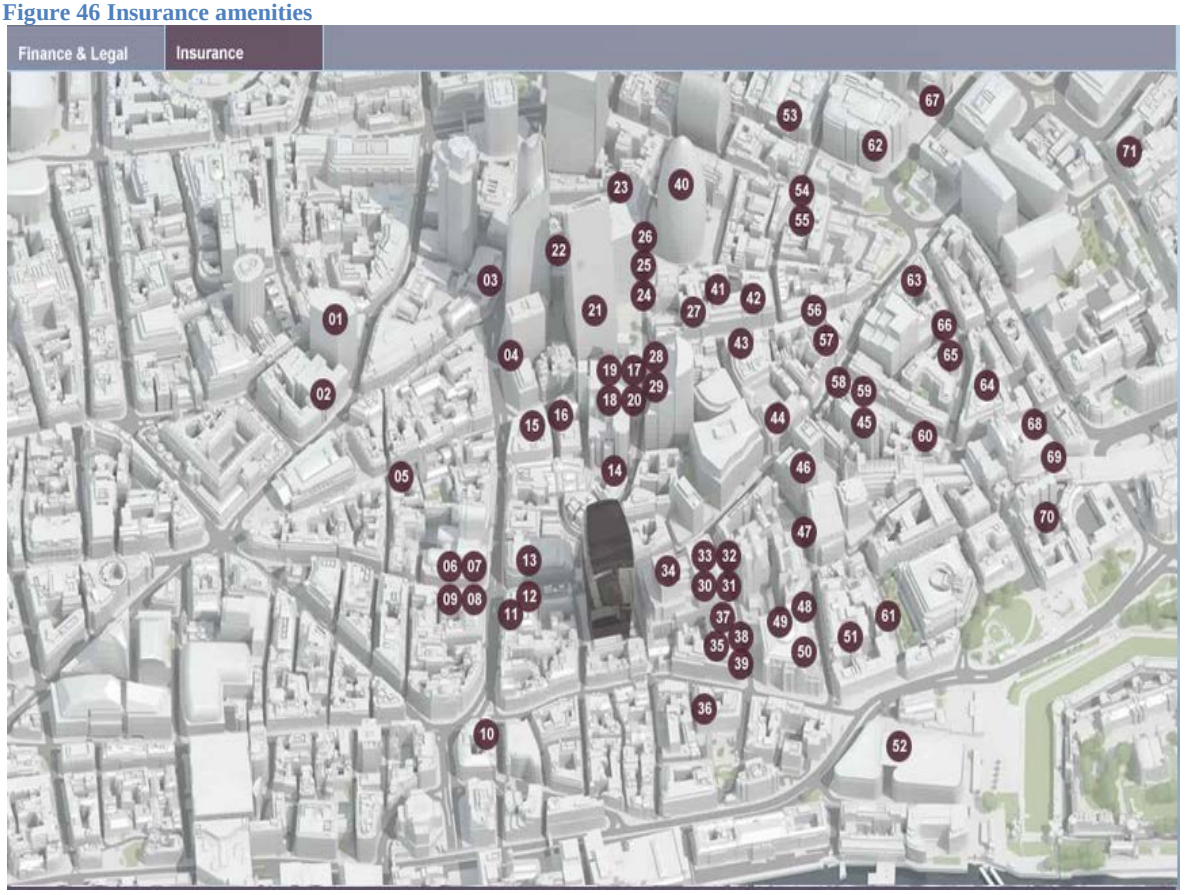
Figure 45 Financial and Legal Amenities



01. Anglo Irish Bank Corporation
02. Aviva Investors
03. HSBC Bank
04. Bloomberg
05. Natixis
06. Lloyds Banking Group
07. Rothschild
08. Bank of England
09. VTB
10. Daiwa
11. National Bank of Greece
12. M&G
13. Nomura
14. Berenberg Bank
15. Toronto Dominion
16. USS Investments
17. UBS
18. Prudential
19. Man Group
20. RBC
21. White & Case
22. KBC
23. Deutsche Bank
24. Bank of Korea
25. Latham & Watkins
26. City Forex Europe
27. FirstRand Bank
28. Royal London
29. Chadbourne & Parke
30. BLP
31. Quilter
32. Hunton & Williams
33. Ion Trading
34. Deutsche Pfandbriefbank
35. Kennedys
36. Dewey & LeBoeuf
37. Accenture
38. Wells Fargo
39. DAC Beachcroft
40. Sucden Financial
41. Lloyds TSB
42. Parabis Group
43. DNB NOR
44. Tullett Brown
45. IHS Global Insight
46. Kirkland & Ellis
47. London Metal Exchange
48. Clyde & Co
49. Holman Fenwick Willan
50. Scottish Widows Fund
51. Field Fisher Waterhouse
52. Société Générale
53. LCH.Clearnet Group

Source: 20fenchurchstreet.co.uk

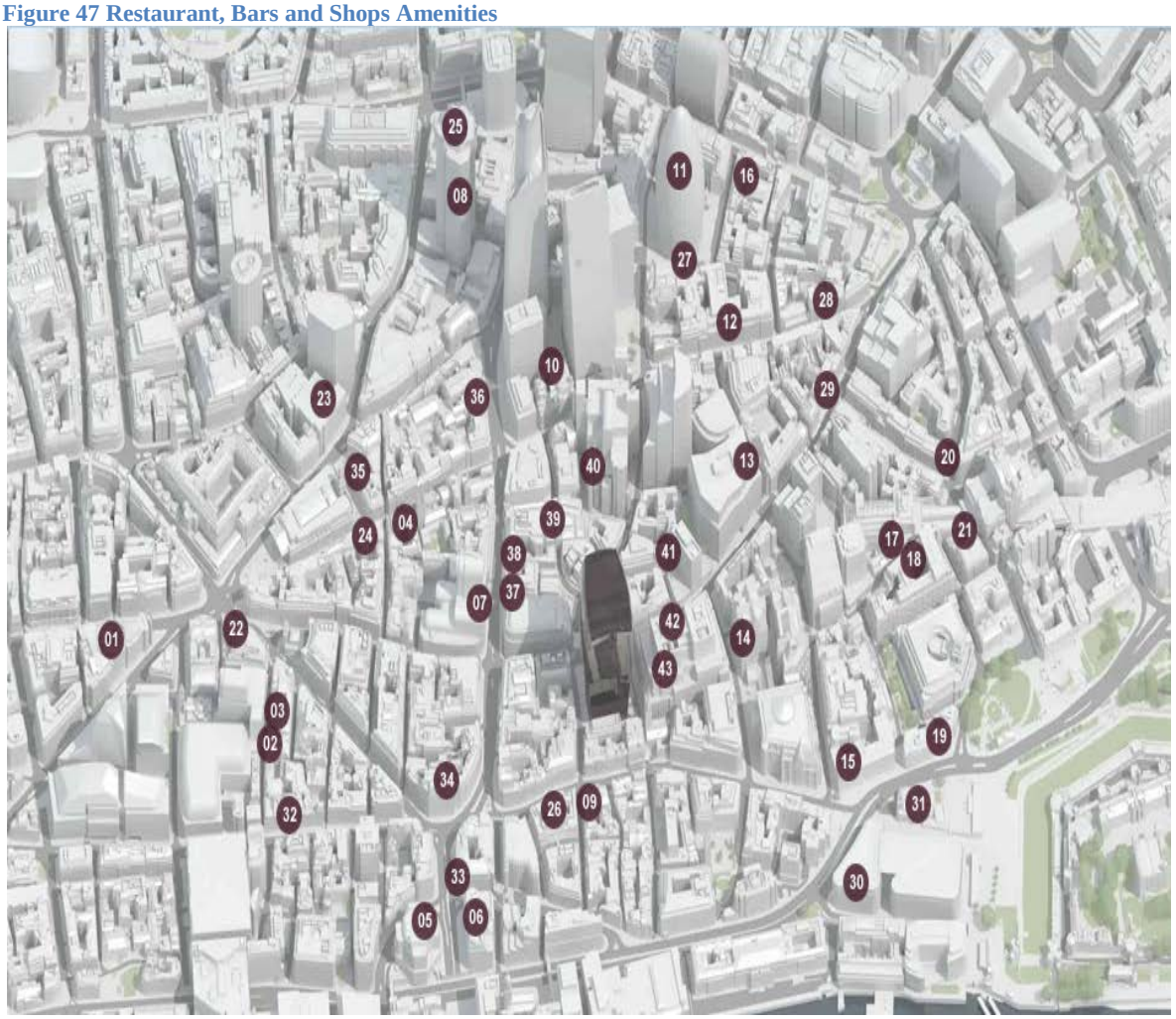
Figure 46 Insurance amenities



01. Renaissance Re Syndicate Management
02. Talbot Underwriting
03. Brit Insurance
04. Starr Managing Agents
05. Miles Smith
06. Robert Fleming
07. Catlin
08. Barbican
09. AEGIS
10. Bell & Clements
11. Allianz
12. Tokio Marine
13. XL Re
14. Antares Managing Agency
15. Royal & Sun Alliance
16. RK Harrison
17. Atrium Underwriters
18. Lloyd's
19. Mitsui Sumitomo Insurance
20. Willis Group
21. Aon
22. Hiscox
23. Travelers Syndicate Management
24. Aviva
25. Amlin
26. Hardy
27. ACE
28. Canopius
29. Ark Syndicate Management
30. Ascot Underwriting
31. Chaucer Syndicates
32. Aspen Insurance
33. Munich Re
34. QBE
35. Beazley
36. Sagicor at Lloyd's
37. Arch Insurance
38. Liberty Syndicate Management
39. Axis Specialty
40. Swiss Re
41. THB Group
42. Torus
43. Markel
44. Kiln Group
45. Windsor Partners
46. AIG
47. Navigators Underwriting
48. Faraday Underwriting
49. Liberty Mutual
50. LUC
51. General Reinsurance UK
52. Marsh
53. Gallagher Heath
54. Newman Martin & Buchan
55. Whittington Capital Management
56. Chubb Europe
57. Cooper Gay
58. Novae Syndicates
59. Lloyds Register
60. Marketform Managing Agency
61. HCC Underwriting Agency
62. Lockton
63. AXA
64. JLT
65. Senior Wrights
66. Miller
67. Tyser &Co
68. Windsor
69. BMS Special Risk Services
70. Besso
71. Houlder Group

Source: 20fenchurchstreet.co.uk

Figure 47 Restaurant, Bars and Shops Amenities



Restaurants			Bars		Shops	
01. Coq D'argent	08. Rhodes 24	15. Addendum	22. 1 Lombard Street	29. Willy's Wine Bar	32. Jones the Bootmaker	39. Links of London
02. The Don	09. Franco's	16. Soseki	23. Brasserie Blanc	30. Davy's	33. Snow and Rock	40. Leadenhall Market
03. Swithins	10. Prism Brasserie	17. Le Paris Grill	24. Green Door Bar & Grill	31. All Bar One	34. House of Fraser	41. Space NK
04. George & Vulture	11. Searcys	18. Lloyds Club	25. Vertigo 42		35. Mont Blanc	42. Molton Brown
05. The Gryphon	12. Caravaggio	19. Chez Gerard	26. Steam Wine Bar		36. French Connection	43. Sweaty Betty
06. Mugen	13. The City Flogger	20. The Habit	27. The Sterling		37. Marks & Spencer	
07. Gaucho	14. Bertorelli	21. Orpheus	28. Dion		38. Boots	

Source: 20fenchurchstreet.co.uk

Table 9 Loan Amortization Schedule

85% LTC 30-year construction repayment loan schedule at Interest Rate 6.5% in £						
Year		Remaining balance (begin) for 1st year-> 239mln*0.85	Interest Expense (Remaining Balance at begin*0.065)	Principal Repayment (Fixed Instalments: 205000000/30)	Debt Service (Interest+ Principal)	Remaining Balance at end (Remaining Balance Begin- Debt Service)
2013	1	203150000	13204750	6771666.667	19976416.67	196378333.3
2014	2	196378333.3	12764591.67	6771666.667	19536258.33	189606666.7
2015	3	189606666.7	12324433.33	6771666.667	19096100	182835000
2016	4	182835000	11884275	6771666.667	18655941.67	176063333.3
2017	5	176063333.3	11444116.67	6771666.667	18215783.33	169291666.7
2018	6	169291666.7	11003958.33	6771666.667	17775625	162520000
2019	7	162520000	10563800	6771666.667	17335466.67	155748333.3
2020	8	155748333.3	10123641.67	6771666.667	16895308.33	148976666.7
2021	9	148976666.7	9683483.333	6771666.667	16455150	142205000
2022	10	142205000	9243325	6771666.667	16014991.67	135433333.3
2023	11	135433333.3	8803166.667	6771666.667	15574833.33	128661666.7
2024	12	128661666.7	8363008.333	6771666.667	15134675	121890000
2025	13	121890000	7922850	6771666.667	14694516.67	115118333.3
2026	14	115118333.3	7482691.667	6771666.667	14254358.33	108346666.7
2027	15	108346666.7	7042533.333	6771666.667	13814200	101575000
2028	16	101575000	6602375	6771666.667	13374041.67	94803333.33
2029	17	94803333.33	6162216.667	6771666.667	12933883.33	88031666.67
2030	18	88031666.67	5722058.333	6771666.667	12493725	81260000
2031	19	81260000	5281900	6771666.667	12053566.67	74488333.33
2032	20	74488333.33	4841741.667	6771666.667	11613408.33	67716666.67
2033	21	67716666.67	4401583.333	6771666.667	11173250	60945000
2034	22	60945000	3961425	6771666.667	10733091.67	54173333.33
2035	23	54173333.33	3521266.667	6771666.667	10292933.33	47401666.67
2036	24	47401666.67	3081108.333	6771666.667	9852775	40630000
2037	25	40630000	2640950	6771666.667	9412616.667	33858333.33
2038	26	33858333.33	2200791.667	6771666.667	8972458.333	27086666.67
2039	27	27086666.67	1760633.333	6771666.667	8532300	20315000
2040	28	20315000	1320475	6771666.667	8092141.667	13543333.33
2041	29	13543333.33	880316.6667	6771666.667	7651983.333	6771666.667
2042	30	6771666.667	440158.3333	6771666.667	7211825	0
Total				203150000	407823625	

Source computed by author

Table 10 Pro-Forma Income Statement Forecast 2018-2022

	2018	2019	2020	2021	2022
Gross potential income	41696889	42676766	43679670	44706143	45756737
Less Vacancy Loss (10.25%)	-4273931.2	-4374368.5	-4477166.2	-4582379.6	-4690065.5
Gross income	37422958	38302398	39202504	40123763	41066671
Operating Expenses					
Maintenance Expenses					
Fabric Repair / Maintenance	417101.8	419229.02	421367.08	423516.06	425675.99
Lift& Escalators Maintenance	165402.44	166245.99	167093.84	167946.02	168802.55
Mechanical and Electrical Maintenance	1244114	1250459	1256836.3	1263246.2	1269688.7
Cleaning& Landscape	524972.95	527650.31	530341.33	533046.07	535764.61
Utility (Common area)					
Water	1407.0002	1414.1759	1421.3882	1428.6373	1435.9233
Electricity	11256.002	11313.407	11371.106	11429.098	11487.387
Gas	3634.7505	3653.2878	3671.9195	3690.6463	3709.4686
Administrative expenses					
Management	280465	281895.37	283333.04	284778.04	286230.41
Site Management	172593.85	173474.08	174358.79	175248.02	176141.79
Security	532164.36	534878.4	537606.28	540348.07	543103.85
Reserve Replacement (3.5% of NOI)	1309803.5	1340583.9	1372087.6	1404331.7	1437333.5
Total Operating Expenses	-4662915.7	-4710796.9	-4759488.7	-4809008.5	-4859374.2
Net Operating Income (NOI)	**32760043**	**33591601**	**34443015**	**35314754**	**36207297**
Interest Expense	-11003958	-10563800	-10123642	-9683483	-9243325
Net Income Before Tax	21756085	23027801	24319373	25631271	26963972
Wear and Tear Allowances (10% of NOI)	2175608.5	2302780.1	2431937.3	2563127.1	2696397.2
Taxable Income	19580476	20725021	21887436	23068144	24267575
Income Tax (23%)	4503509.5	4766754.8	5034110.3	5305673.2	5581542.2
Net Income After Tax	**17252575**	**18261046**	**19285263**	**20325598**	**21382430**

Source computed by author

Table 11 Pro-Forma Income Statement Forecast 2023-2027

	2023	2024	2025	2026	2027
Gross potential income	46832020	47932573	49058988	50211874	51391853
Less Vacancy Loss (10.25%)	-4800282.1	-4913088.7	-5028546.3	-5146717.1	-5267665
Gross income	42031738	43019484	44030442	45065157	46124188
Operating Expenses					
Maintenance Expenses					
Fabric Repair / Maintenance	427846.94	430028.96	432222.1	434426.44	436642.01
Lift& Escalators Maintenance	169663.44	170528.72	171398.42	172272.55	173151.14
Mechanical and Electrical Maintenance	1276164.1	1282672.6	1289214.2	1295789.2	1302397.7
Cleaning& Landscape	538497.01	541243.34	544003.68	546778.1	549566.67
Utility (Common area)					
Water	1443.2465	1450.6071	1458.0052	1465.441	1472.9148
Electricity	11545.972	11604.857	11664.042	11723.528	11783.318
Gas	3728.3869	3747.4017	3766.5134	3785.7227	3805.0298
Administrative expenses					
Management	287690.18	289157.4	290632.1	292114.33	293604.11

Site Management	177040.11	177943.02	178850.53	179762.66	180679.45
Security	545873.68	548657.63	551455.79	554268.21	557094.98
Reserve Replacement (3.5% of NOI)	1471110.8	1505681.9	1541065.5	1577280.5	1614346.6
Total Operating Expenses	-4910603.9	-4962716.4	-5015730.9	-5069666.7	-5124543.9
Net Operating Income (NOI)	**37121134**	**38056767**	**39014711**	**39995491**	**40999644**
Interest Expense	-8831666.7	-8363008.3	-7922850	-7482691.7	-7042533.3
Net Income Before Tax	28289467	29693759	31091861	32512799	33957111
Wear and Tear Allowances (10% of NOI)	2828946.7	2969375.9	3109186.1	3251279.9	3395711.1
Taxable Income	25460521	26724383	27982675	29261519	30561400
Income Tax (23%)	5855919.8	6146608.1	6436015.2	6730149.4	7029122
Net Income After Tax	**22433548**	**23547151**	**24655846**	**25782649**	**26927989**

Source computed by author

Table 12 Operating cost computation details

	cost per ft^2 per annum (at year 2007)	**cost per m^2 per annum= 10.764*cost per ft^2**	**amount of space in m^2**	**Total cost per year =cost per m^2 * amount of space**	**Inflation factor (0.51% per year) = total cost*1.0051^number of year (i.e. for the year 2013-> order of year is 6 since 2007-> 1.0051^6)**
Maintenance Expenses					
Fabric Repair and Maintenance	0.58	6.24312	63174	394402.8629	406626.5171
Lift& Escalators Maintenance	0.23	2.47572	63174	156401.1353	161248.4464
Mechanical and Electrical Maintenance	1.73	18.62172	63174	1176408.539	1212868.749
Cleaning& Landscape	0.73	7.85772	63174	496403.6033	511788.5474
Utility (Common area)					
Water	0.12	1.29168	1030	1330.4304	1371.664181
Electricity	0.96	10.33344	1030	10643.4432	10973.31345
Gas	0.31	3.33684	1030	3436.9452	3543.465801
Administrative expenses					
Management	0.39	4.19796	63174	265201.925	273421.2788
Site Management	0.24	2.58336	63174	163201.1846	168259.2485
Security	0.74	7.96536	63174	503203.6526	518799.3494

Source computed by author

Table 13 Income statement for self-financed investment 2018-2022 (only differing part)

Income Statement (Self-financed)	2018	2019	2020	2021	2022
Net Operating Income (NOI)	32760042.5	33591600.78	34443015.32	35314754.4	36207297.14
Wear and Tear Allowances (10% of NOI)	3276004.25	3359160.078	3444301.532	3531475.44	3620729.714
Taxable Income	29484038.3	30232440.7	30998713.79	31783278.9	32586567.43
Income Tax (23%)	6781328.8	6953461.362	7129704.171	7310154.15	7494910.508
Net Income After Tax	25978713.7	26638139.42	27313311.15	28004600.2	28712386.63

Source computed by author

Table 14 Income statement for self-financed investment 2023-2027 (only differing part)

Income statement (Self-financed)	2023	2024	2025	2026	2027
Net Operating Income (NOI)	37121134.2	38056767.5	39014710.97	39995490.5	40999644.45
Wear and Tear Allowances (10% of NOI)	3712113.42	3805676.75	3901471.097	3999549.05	4099964.445
Taxable Income	33409020.8	34251090.75	35113239.87	35995941.5	36899680.01
Income Tax (23%)	7684074.77	7877750.872	8076045.171	8279066.54	8486926.402
Net Income After Tax	29437059.4	30179016.63	30938665.8	31716424	32512718.05

Source: computed by author

Table 15 Investment ratio of loan-financed investment

Investment ratios (loan-financed)		2018	2019	2020	2021	2022
Market value at differing initial yields=> Market value=NOI/initial yield	0.07	246465357	260872086	275503757.8	290365688	305463284.4
	0.065	265424231	280939169.5	296696354.5	312701511	328960460.1
	0.06	287542917	304350767	321421050.7	338759970	356373831.8
DSCR		1.8429	1.9377	2.0386	2.1461	2.2608
Net Income ROI		25.90%	28.72%	31.57%	34.47%	37.42%
Cash Flow ROI		29.25%	32.05%	34.91%	37.81%	40.76%
GRM		6.8960	7.131533004	7.3585	7.5774	7.78844
BER		59.96%	57.56%	55.24%	53.00%	50.83%
Total ROI		48.12%	50.94%	53.79%	56.70%	59.64%

Source: computed by author

Table 16 Investment ratio of loan-financed investment

Investment ratios (loan-financed)		2023	2024	2025	2026	2027
Market value at differing initial yields=> Market value=NOI/initial yield	0.07	320479253	336387871.7	352226367.9	368323564	384685558.8
	0.065	345131503	362263861.8	379320703.8	396656146	414276755.7
	0.06	373892462	392452517	410930762.5	429710825	448799818.6
DSCR		2.3834	2.5145	2.6550	2.8058	2.9679
Net Income ROI		40.35%	43.46%	46.55%	49.70%	52.89%
Cash Flow ROI		43.77 %	46.79%	46.89%	53.03%	56.22%
GRM		7.9836	8.1875	8.3762	8.5579	8.7328
BER		48.74%	46.72%	44.77%	42.88%	41.06%
Total ROI		62.66%	65.68%	68.78%	71.92%	75.11%

Source: computed by author

Table 17 Investment ratios for self-financed investment

Investment ratios (self-financed)		2018	2019	2020	2021	2022
Market value at differing initial yields=> Market value=NOI/initial yield	0.07	371124482	380544848.9	390190159.3	400065717	410176951.9
	0.065	399672519	409817529.5	420204786.9	430840003	441729025.1
	0.06	432978562	443968990.3	455221852.5	466743337	478539777.2
Cash Flow ROI		12.24%	12.55%	12.87%	13.20%	13.53%
GRM		10.3839535	10.40306071	10.42182438	10.4402507	10.45834581
BER		12.46%	12.30%	12.14%	11.99%	11.83%
Income ROI		7.54%	7.81%	8.09%	8.38%	8.68%
Total ROI		10.87%	11.15%	11.43%	11.72%	12.01%

Source: computed by author

Table 18 Investment ratios for self-financed investment

Investment ratios (self-financed)		2023	2024	2025	2026	2027
Market value at differing initial yields=> Market value=NOI/initial yield	0.07	420529420	431128809	441980940	453091771	464467400.7
	0.065	452877837	464292563.5	475979473.8	487944984	500195662.3
	0.06	490617657	502983610.4	515644430	528607066	541878634.2
Cash Flow ROI		13.87%	14.22%	14.58%	14.94%	15.32%
Income ROI		12.32%	12.63%	12.95%	13.27%	13.60%
GRM		10.4761156	10.49356591	10.51070252	10.5275311	10.54405706
BER		11.68%	11.54%	11.39%	11.25%	11.11%
Income ROI		8.98%	9.29%	9.61%	9.94%	10.27%
Total ROI		12.32%	12.63%	12.95%	13.27%	13.60%

Source: computed by author