

CZECH UNIVERSITY OF LIFE SCIENCES

PRAGUE

FACULTY OF ECONOMICS AND MANAGEMENT

DEPARTMENT OF ECONOMICS



Bachelor Thesis

Economic analysis of residential real estate sector in the United Kingdom

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Department of Economics
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BACHELOR THESIS ASSIGNMENT

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Agricultural Economics and Management

Thesis title

Economic analysis of residential real estate sector in the UK

Objectives of thesis

The aim of this bachelor thesis is to determine the influence of various micro - and macro-economic indicators on residential real estate market in the UK.

Methodology

Chosen method of quantitative analysis of residential real estate sector (month supply, etc). In the quantitative analysis of residential sector is used secondary data from authoritative UK statistical office.

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Prague February 23, 2012

Declaration

I do hereby declare that this bachelor thesis named “Economic analysis of residential real estate sector in the United Kingdom” is completed by myself independently and only the sources listed in the bibliography 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. I am deeply indebted to my supervisor Petr Procházka, Ing, MSc, Ph.D, whose help, stimulating suggestions and encouragement helped me in all the time of research for and writing of this thesis.

Summary

This bachelor thesis is focused on UK housing market evaluation, and on comparison analysis among constituent countries within the borders of the kingdom. Therefore, it has been employed the synthesis of market researches, and quantitative market analysis of economic indicators to determine the supply of and demand for housing. The analysis deduced that housing markets across the UK recently experience a downturn, which was generated by the financial crisis. Additionally, it was proved that purchase of housing is affordable primarily through mortgages. Consequently, the restrictive policies adopted in the year 2007 by UK banks have generated a weakened demand for housing and a decline in real house prices. Moreover, the study defined that inadequate supply of housing over long-term, deregulations in financial institutions' policies and later abolishment of them generated housing market volatility across the kingdom. Therefore, author recommended reviewing the politics of land use regulations, and relaxation of the restrictions imposed on borrowers.

Key words: United Kingdom, England, Scotland, Northern Ireland, Wales, housing market, residential real estate, recession, market analysis, economy.

Souhrn

Bakalářská práce je zaměřena na hodnocení trhu s nemovitostmi ve Spojeném království a komparaci mezi zeměmi v rámci hranic království. Bylo využito syntézy výzkumů trhu a kvantitativní analýzy trhu ekonomických ukazatelů určujících nabídku a poptávku po bydlení. Analýza prokázala, že trh s nemovitostmi ve Velké Británii nedávno zažil pokles, který byl zapříčiněný finanční krizí. Dále bylo prokázáno, že nákup nemovitosti je možné pouze prostřednictvím hypotéky. V důsledku restriktivní politiky, přijaté v roce 2007, banky ve Velké Británii zaznamenali oslabení poptávky po nemovitostech a snížení reálných cen nemovitostí. Kromě toho tato studie prokázala neadekvátnost nabídek v dlouhodobém horizontu, deregulaci finančních trhů pomocí právních předpisů a později jejich zrušení k vytvoření a zintenzivnění kolísavosti finančních trhů v celé Velké Británii. V závěru bylo doporučeno přezkoumání předpisů o využívání půdy a uvolnění omezení uvalená na dlužníky.

Klíčové pojmy: Spojené království, Anglie, Skotsko, Wales, Severní Irsko, kvantitativní analýza, rezidenčních nemovitostí, recese, analýza trhů nemovitostí, recese, ekonomika.

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Economic analysis of residential real estate sector in the
United Kingdom

Ekonomická analýza trhu rezidenčních nemovitostí ve Velké
Británii

1. Introduction

The housing market in the United Kingdom experienced a phase of ‘depression’ resulting from a collapse in the early 1990s. Thereupon, it was followed by the relaxation of regulations on the credit market and a low level of inflation that resulted in house price acceleration during the period 1996 to 2006. Simultaneously, unfavourable outcomes were developing: the house prices grew faster than households’ incomes, it became volatile with unaffordable homeownership for first time buyers. Due to the enhanced availability of loans associated with high loan-to-value ratio and low interest rates, it became popular to fund house purchases through mortgages, thereby generating a dependence of households on the financial institutions. [23]

Meanwhile, a large quantity of unsecured loans and rapid house price inflation coupled with a collapse of the credit market in the USA in December 2007 resulted in new restrictive policies of the UK Banks. These policies were aimed to strengthen their balance sheets by reducing affordability of mortgages through low loan-to-value ratio, and increase interest rates and charged fees. Since the majority of house purchases in the UK are funded through loans and mortgages, the credit market crisis severely affected the housing market in the UK. [23]

BBC News announced in the last quarter of the year 2008 that The UK officially entered the recession phase. [24] As the definition of recession implies, there occurred a negative growth of GDP in two successive quarters: in the third quarter of 2008, the production output declined by 0.6 % followed by a fall of 1.5 % in the fourth quarter. [15] The UK housing market responded to the crisis by a default of house prices that has lead to further macroeconomic instability. [14]

The recent state of the housing market is a much-debated topic amongst analysts and policy makers, who research the reasons of The UK housing market volatility, and it’s interrelation with macroeconomic factors.

2.Aims and methodology

The aims of this bachelor thesis are:

- to evaluate the current state of the housing market in the United Kingdom with the use of economic indicators;
- to establish a comparison analysis of those indicators among constituent countries within the borders of the Kingdom;
- to examine the influence of both macro- and micro-economic indicators on the housing market.

To accomplish the aims of the bachelor thesis, specialized literature will be reviewed and the synthesis of housing market researches will be provided. Therefore, these methods will assist in establishing proper knowledge, and explaining the definitions related to the real estate market. Afterwards, the secondary data from statistical offices will be collected, to conduct quantitative market analysis of economic indicators, which will reflect the supply of and demand for housing. The relevant indicators will be selected from studied literature. Thereby, the following will be examined: Gross Value Added, growth in households' disposable income, demographic trends, vacancy rate, absorption rate, affordability ratios, construction starts and completes, house price index, and rent price index. Additionally the qualitative analysis of graphs and histograms, and the comparative analysis of chosen indicators among countries in the United Kingdom will be provided. To summarize, specified types of analysis will contribute to an objective and comprehensive conclusions and recommendations for economic analysis of residential real estate market in the UK.

3.Literature Review

The following chapters provide an overview of residential property market, its correlation with economy on regional and national scales and reveal researches of the UK housing market.

3.1. Key Definitions

Real estate denotes: “Landed property, including all estates and interest in lands which are held for life or for some greater estate, and whether such lands be of freehold or copyhold tenure.”[2]

Land can be defined as “the earth’s surface extending downward to the center of the earth and upward to infinity, including permanent natural objects such as trees and water.” [5]

Real property or realty denotes “...land, anything affixed or attached to the land, and anything incidental or appurtenant to the land. Sometimes real property is described as “immovable.”” [12]

According to the Department for Communities and Local Government, *dwelling* is “... a self-contained unit of accommodation... Therefore, a dwelling can consist of one self-contained household space or two or more non-self-contained household spaces at the same address.” “Self-containment is where all the rooms (including kitchen, bathroom and toilet) in a household's accommodation are behind a single door which only that household can use.” [17]

Housing Act 2004 identifies the term *housing* as “a building, or part of a building, occupied or intended to be occupied as a dwelling or as more than one dwelling; and includes a hostel which provides temporary residential accommodation”. [40]

According to Housing and Regeneration Act 2008, residential property is “a building which is, or is intended to be, occupied as a separate dwelling (including one that is being designed or constructed or is to be constructed) and includes any ancillary land, but it does not include a newly converted residential property.” [41]

3.2. Features of Real Property

Real property has unique features that determine its nature, price, and usage. These features are primarily associated with land, and are classified as either economic features or physical features. [12]

1.1.1. Economic features

The market value of real property is influenced by the following economic features:

- *Scarcity* refers to the concept of limited supply of developable land. However, the demand for land is a decisive factor in determining the scarcity of land in certain areas. Notably, the demand for land is considerably larger in urban and sub-urban districts compared to countryside districts.
- *Improvements* that are constructed on the lot can influence the price, the development potential, and the usage of surrounding lots, either positively or negatively.
- The notion of *investment's permanence* or fixity encompasses the impossibility of both lot and improvements relocation to a more preferable area. These are considered to be an investment if contribution of money and labour force in the development of the lot and construction of improvements has already been undertaken.
- *Area preference* reflects the idea that the value of real property depends on the neighbourhood or district where it is located. [12]

1.1.2. Physical features

The physical features of land that affect the usage and nature of real property are:

- *immobility*: reflecting the continual fixity of land at its “geographic location,”
- *indestructibility*: designates the impossibility of a plot's annihilation or destruction,
- *uniqueness or non-homogeneity*: designates that each plot of land is different from others, because of its fixation at a particular “geographic location”. [12]

3.3. Categorization of Real Property

There are many types of real properties that are used for different purposes. According to the book “Modern Real Estate Practices,” real properties are categorized into five groups: residential property, commercial property, industrial property, agricultural property, and special purpose property. [5] Since this bachelor thesis is focused on the residential market, the description of real property categories is narrowed to residential property.

3.3.1. Residential Property

Residential properties are built on plots of land that are suitable for such purposes. Since residential properties meet the primary necessities for life by providing shelter and a secure, private space, those are essential for people's survival. [5] However, high

prices, inadequate size and capacity, and limited supply of housing in the UK generate problems with overcrowding, quality of housing and constrained number of alternatives among housing types. This in turn adversely influences the quality of landowners' lives. During the period 2004 to 2009, the ratio of people who resided in overcrowded conditions more than doubled to 4.7% for owner-occupied stock, and increased from 13.7 % to 17.5 % for social housing. In addition, households had constrained alternatives among the types of dwellings, because of housing price, and residential market undersupply. [3]

According to Goodchild, the common types of residential real estate in the UK included detached, semi-detached, high-rise flats, low-rise flats, bungalows, and terraces. Detached houses incorporate residential units that are located at a separate lot and do not have common walls with other dwelling, whereas, semi-detached houses are characterized by two detached houses sharing a common wall. These types of houses represent the pattern of an "ideal house" that is associated with sufficient daylight, excellent air circulation and a private lot of land, where owners mainly park cars, cultivate plants, and establish facilities for family recreation. Moreover, owners of detached and semi-detached houses have a right to construct improvements, redesign, develop, and put the house up for sale, without obtaining permissions from authorities. However, these types of houses are costly because construction of them requires a considerable piece of land. In addition, costs of the maintenance of houses, and fees charged by public utilities are large. Another popular type of dwelling is a bungalow, a house with one storey. Thereby, they are suitable for people with limited physical abilities. Nevertheless, construction of bungalows is costly, because it demands a spacious lot of land, and a large rooftop. The next type of dwellings is terraced houses that are associated with efficient usage of parcel, economical energy consumption, and low building cost. Additionally, each house has a separate entrance, and a plot of land for plant cultivation. However, terraced houses have lack of "privacy" in the plot, and some of them do not encompass a place to park a car. [6]

The next category of residential property is high-rise flats. High-rise flats are typical for urban areas, where the availability of developable land is extremely low. However, high-rise flats are costly because of elevators that are installed in the building and the

use of special equipments during construction. Moreover, this type of residential property is unsuitable for families with children, because of irregular air-circulation, and risks associated with the height of the building. Lately, the construction rate of high-rise flats has declined due to a review of governmental policies. The last type of dwellings are low-rise flats that are typified by a shared entrance to the building represented by a stairway or balcony. Low-rise flats are comparatively economical in terms of construction, and are mostly built in crowded areas with a constrained supply of land. However, possession of this type of housing is costly, because the upkeep of the stairway, parking, elevators, entranceway, and other shared areas is costly. Moreover, balconies amplify noise waves, darken the flats on the lower storey, and are frozen during cold weather. Historically, it was believed that households below the country's average income, primarily occupied flats. Nevertheless, flats have been built for upper or medium classes. The main disadvantage of flats is that fees associated with building repairs have to be administered separately. However, both high-rise flats and low-rise flats can be adapted for student hostels, public or social housing. [6]

To summarize, the most preferable types of residential properties in the UK are single-detached and semi-detached, because of the level of "privacy," which is valuable for most of the British population. [4] However, these types of housing are too expensive for first time buyers. Under such circumstances, first time buyers reside in less favourable conditions, or are indirectly forced to lease. [3]

3.4. Economics of Real Estate Market

3.4.1. Real Estate Market analysis

Real estate market is defined as "The interaction of individuals who exchange real property rights for other assets, such as money." Therefore, cooperation of real estate agents, brokers, investors, developers, managers, together with purchasers, sellers, governments and builders generate the real property market. Observation of the economic indicator's behaviour on the short-term or long-term is applied for estimation of the current market situation. [7] The following types of analysis are concentrated on market research:

- *Analysis of local economies* focuses on trends that examine factors influencing the demand for all types of real property in the area where the market operates. [7]

- *Market analysis* is concerned with analysis of supply and demand of specific types of real estate. [7]
- *Marketability analysis* is associated with the research developed to estimate competitiveness over certain projects or estate in the market resulting in a formulation of forecast. [7]
- The next two types of analysis are primarily related to personal decisions:
- *Feasibility analysis* refers to analysis of a particular project. Costs, benefits and end-user of the particular project are determined by an analyst to estimate the probability of a project's success in the future. [7]
- *Investment analysis* studies the real property market from an investor's perspective, and involves analysis of offered funding alternatives. Therefore, it has examined financial indicators. [7]

Considering that the market analysis is employed to gain the aims of this bachelor thesis, more detailed information about it is provided. Therefore, the demand side analysis and supply side analysis are discussed. *Demand side analysis* is focused on the estimation of population and migration trends, employment rates, income, living standards, affordability ratios, absorption rates and other aspects that are assumed to be important for analysis. The *supply side is analyzed* by measuring the stock of dwellings, construction start, and completion. The analysis of balance between supply and demand sides, or the equilibrium is reflected in the study of vacancy and occupation rates, market rents, and sales price. [7]

3.4.2. Economic indicators used to analyze the housing market

For analysis of residential real estate market, the examination of indicators that characterize the macro- and micro-environments governing the decisions of demand and supply sides is employed. Data is represented in the form of graphs and histograms, and computed on the basis of percentage change. The general formula for calculating percentage change of variable Y (price, volume) between period t and t+1 is:

$$\underline{\% \text{ change} = 100\% * (Y_{t+1} - Y_t) / Y_t} \text{ [9]}$$

The description of selected indicators for real estate market analysis:

1) *Gross Value Added (GVA) at basic prices* is addition of subsidies to GDP at market prices deducted for indirect taxes. GVA per head reflects the economic well-being in the country. [13]

2) *The inflation rate* is defined as percentage change in price level over a period. [9] National inflation rate computation is based on a consumer price index, and indicates the change of price level of a fixed market basket over a period for a given state. Supply shock and demand-pull are theories that explain reasons for inflation. The supply shock theory declares that inflation occurs due to pressure on price by higher wages, and an increase in production cost, that leads to an increase in output price. Demand-pull theory deduces that the inflation is caused when the spending power of consumers is higher than the quantity of goods and services supplied. Analysis of inflation rates is beneficial in examining the stages of economic cycles, because it reflects the consumer behaviour. [13]

3) *The unemployment rate* is defined as the percent of people unemployed from the total labour force that is represented by the sum of people employed or self-employed and people unemployed, but able to work. [13]

4) *Real household disposable income* is income obtained by households from wages, salaries, rents, dividends, donations, after subtraction for personal taxes, and adjustment for inflation. [13]

5) *Vacancy rate* is determined as a ratio of vacant stock that is not occupied to the total stock, expressed in the percentage. [22]

6) *Housing starts and completions*. Housing starts are computed on the date when the construction of the building appears, whereas housing completions are calculated from the date the house sale is initiated. These terms directly relate to rates of employment, population growth, household income, and interest rates. Demand for production materials and labour force intensifies, when the construction starts. While the period of construction completion is associated with growth in number of established mortgages, demand for household appliances, furniture, and other goods. [13]

7) *Net supply* is the total amount of dwellings appearing in the market after the subtraction of demolitions and addition of conversion and change of use. [21]

8) *Affordability ratios* encompass the ratio of real median house prices to annual real median earnings, and proportion of minimum mortgage deposit to annual income of borrowers that indicate the chance of individuals to purchase a dwelling, or obtain a mortgage. Researcher Duffy considers the minimum mortgage deposit as a 10% of new dwelling price. Thereby, this method will be employed by me in analysis of UK housing market, with an exception that it will be computed based on data for median house prices and annual real median earnings. [18]

9) *Absorption rate* designates the number of real properties sold per month. This indicates the amount of dwellings absorbed by households, and reflects the demand for housing. [7]

3.4.3. Economic trends versus cycles

The demand for and supply of real property is dependent on economic cycles and trends experienced by individual countries or worldwide. The *trend* denotes long-term economic growth or expansion, and directly relates to economic output that is determined by the employment rate and productivity of labour. The increase in population and employment are constrained factors, but the labour productivity is continually increasing due to technological progresses, and the development of improvements within work places. The essential proposition is that the long term economic growth proceeds as long as economic output expands faster than the size of the population. *The economic cycles* are primarily observed over the short-term, and denote oscillation over the trend. Five phases are identified in economic cycles. A cycle starts with an *expansion* phase that refers to a rapid increase in demand motivating suppliers to produce more output, as a result, unemployed people are hired, and more investments are made to increase the production capacities. Therefore, people spend more money. The guiding indicator of expansion is that the output increases faster than the demand. The next phase is the *peak* point, which is determined by the maximum output produced within a country, full employment, and a rise in interest rate that occur because of a high demand on investments. However, when the production constraints are faced, interest rates are too high, and further investment is not reasonable, the phase of *recession* occurs. This phase reflects the decrease in demand for investments, and results in an increase of unemployment reducing the demand for output. The recession

phase continues until the *trough or depression*, denoting that the minimum point of production output is reached. During the trough point, the demand remains mostly on basic essentials and food, unemployed people are supported by past savings and loans, and interest rates decrease due to low rates of investments. The *recovery* occurs, when the production of basic essentials and food is gradually expanded, demand for investments rises, and economic output deliberately increases. [13]

3.4.4. The housing market's characteristics

The housing market analysis is convoluted due to the complex structure of the housing market, which unique features fragment market to limply joined submarkets. The features of housing market are:

- The housing simultaneously performs as an investment for a purpose to obtain a capital gain and as an ordinary good, which benefits are consumed;
- The construction or supply of house building is very expensive and time-consuming;
- The housing is a durable good, and is fixed to the area where it is built;
- The housing market is heterogeneous. Two analogous dwellings, at all points, do not exist in the market;
- The purchase of housing is associated with large expenditure due to the considerable price of housing compared to the prices of other goods;

Nevertheless, from economists' perspective the prices for housing are determined by the equilibrium between supply of and demand for housing. [20]

3.4.5. The demand for housing

The demand for housing is defined by Pozdena as “the quantity of housing desired by households individually and in the aggregate.” [11] The distinctive characteristics of the housing market are encompassed in models of demand for housing. For instance, the high price of housing implies a correlation of demand for housing with capital saved during the past, cost of funding options, and policies of the financial institutions. Furthermore, the influence of different factors on demand for housing is dependent on whether there is a perfect capital market indicating no credit restriction, or there is credit constrained market. [20]

With regards to the conditions of perfect capital market, the demand curve is descending with a negative deviant signifying that real house prices adversely impact

the housing demand. Additionally, growth of the interest rate generates the decline in demand for housing, due to increased cost associated with the consumption of housing services. However, the demand for housing is positively influenced by current and future income and expected growth in real house prices. Considering that the interest paid to a lender is tax deductible, the relation between the income tax rate and housing demand is uncertain and derived from a condition regarding whether or not the increase in cost of loan is larger than the growth of disposable income. [20]

The impact of factors discussed above is dubious in the credit-restricted market with imperative quantitative constraints implemented on debtors. As a result, the demand for housing responds by an increase to an alleviation of credit constraints. Furthermore, the rise in current income is positively influenced by the housing demand. The principle of “hedging effect” signifies that the primary purpose of consuming housing is achievement of capital gain, and the housing demand is adversely correlated with expected income and responds positively to interest rate fluctuations. Therefore, the growth in housing demand occurs, when the interest rate appreciates or expected income declines which denotes reduced future expenditure on goods and services. Considering that residential real estate is an excellent opportunity for investment of money in a credit constrained economy, individuals concerned about the future will purchase housing to stabilize future income and will accumulate savings, which will consequently push the housing demand to rise. Additionally, under the assumption of the “hedging effect” concept, there is an ambivalent reaction of the housing demand for a variation in real house prices, income tax rates, and expected capital gains. Since the expansion of consumers’ lending power results from the increase of real house price then both the housing demand and demand for other goods and services augment. [20]

The effects of various factors are summarized in the Table 1.

Table 1: The influence of variables on housing demand

	Perfect capital markets	Credit restricted markets
Real house prices	-	?
Current income	+	+
Future income	+	-
Expected capital gains	+	?
Income tax rates	?	?
Interest rate	-	+
Credit		+

Source: [20]

This chapter determines factors influencing the demand for housing. Since equilibrium price in the market is established by the intersection of supply and demand curves, variables, which affect supply of housing, are analyzed in the next chapter. [20]

3.4.6. The supply of housing

The primary suppliers of housing are construction enterprises, whose output is limited by the costs and availability of various inputs. The analysis of Salo was a foundation for the model proposed by Kenny that is employed for identifying the response of housing supply to the differentiating variables, including changes in inputs. Accordingly, the impact of variables depends on whether there are no land restrictions indicating decreasing returns to scale, or there are obligatory restrictions imposed on suppliers denoting constant returns to scale. The influence of variables to the supply of housing is depicted in Table 2.

Table 2: The influence of variables on housing supply

Housing supply	No Land Constraints	Binding Land Constraints
Real House Prices	+	+
Future House Prices	+	+
Land Prices	-	
Price of other inputs (Labour, Materials)	-	-
Probability that a % of Production is Pre-sold	+	+
Proportion that is Pre-sold	+	+
Interest rates	-	-
Land Prices		+

Source: [20]

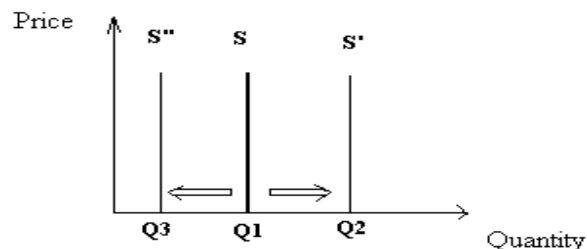
Considering both situations, the supply of housing reacts by expanding output to the growth of real and predicted house prices, to the increased proportion of pre-sold output and a probability that a certain percentage of the existing output will be pre-sold. Nevertheless, the variations of interest rates and other inputs adversely influence the supply of housing. Regarding the first situation, price for land also negatively affects the housing supply. The increase in these variables results in limited supply, because of the rise in costs of production. In the second situation with obligatory land restrictions, it is obvious that alleviation or deregulation of land restrictions positively affects the housing supply. [20]

The supply of housing in the short-run is autonomous from the house prices, hence inelastic, because of time lags requested for building processes, conversions, or

demolitions. [11] Additionally, Kenny explains this phenomena by the “perpetual inventory” model that is: $H_t = (1 - \delta) H_{t-1} + A_t$ Considering this model, (H_t) the quantity of dwelling in the period t is equivalent to subtraction of economic depreciation of dwelling (δH_{t-1}) from the sum of the quantity of dwelling in the previous period (H_{t-1}) and the amount of dwellings completed (A_t) that is diminutive compared to aggregate quantity of dwellings and pre-defined by the constructions starts. [20] The economic depreciation is a decrease in value of asset due to wear and tear over period. The annual economic depreciation of owner-occupied and tenant-occupied housing is approximately 1.2% and 1.4% respectively. Nevertheless, aged dwellings continue to be used by mostly working class citizens. [11] Therefore, the economic depreciation of housing has scanty impact on the stock of housing. Hence, the supply of housing in the short-run is fixed.

According to Pozdena, new additions to the stock of housing or “net investment” occur in the short-run if the “gross investment” exceeds losses, and supply curve S shifts rightward to the S' , what is delineated on the Figure 1. Otherwise, “disinvestment” to the stock proceeds, and the initial supply curve shifts to the left to S'' .

Figure 1: Net additions to stock of housing in the short-run



Source: constructed myself based on [11]

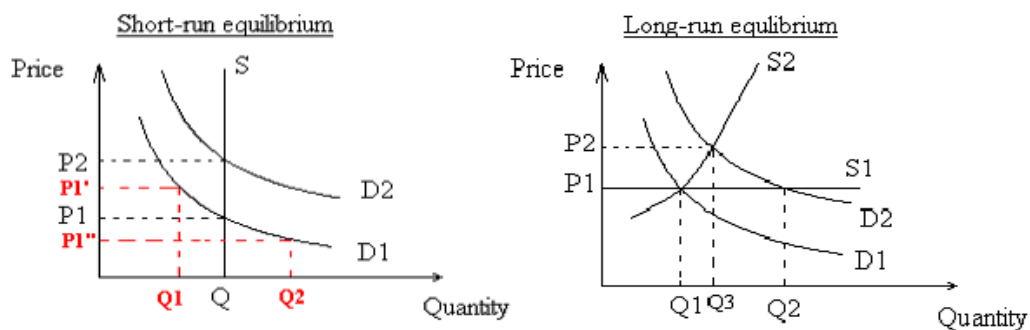
The term “gross investment” refers to the sum of maintenance, conversions, and construction completion, whereas the losses incorporate depreciation and demolitions of dwellings. The housing completion and conversion sustain the quality of the current stock and new additions to it. The last component is maintenance, which is the upkeep of housing counteracting the depreciation of dwellings. However, the dwelling is deserted if maintenance expenditures become larger than the cost of property. However, the housing is demolished only if different usage of the lot, where the dwelling is located, is worth the cost of demolition. [11]

In the long run, the housing supply is elastic. Construction enterprises increase production in the long term due to rising demand for housing caused by growth of various factors (i.e. increase in real income or real prices, changes in interest rate). The long-run housing supply is either perfectly elastic or positively elastic. [20] The further explanation of the long-run housing supply is discussed in the next chapter.

3.4.7. The long-run and short-run equilibrium

The equilibrium is an optimal point or intersection between supply and demand curves, at which the quantity supplied to the market equivalent and the quantity demanded on the market is balanced. Figure 2 shows the short-run equilibrium (Q, P_1). Since the short-run supply of housing S is fixed at the point Q then the demand for housing D_1 determines the equilibrium. The P_1 is an optimal price at which all dwellings produced are sold. Moreover, if the price increments from the equilibrium to the P_1' (i.e. for instance) then the market will be oversupplied and $Q > Q_1$. Conversely, any decrease of price from the equilibrium will be followed by an excess demand and $Q < Q_2$. Concerning the graph, it is obvious that the equilibrium price of dwellings is defined by the shifts in the housing demand curve. Therefore, a growth of any external factors that positively influence the demand generate the shift of the housing demand curve from D_1 to D_2 which alters the initial equilibrium to a new optimal point (Q, P_2). Moreover, the price for housing follows the demand and appreciates. As a result, from microeconomic perspective there is a correlation between real prices of housing and housing demand, which induces the changes in house prices. Consequently, the factors that influence the decisions of households determine house price fluctuations.

Figure 2: Short-run and long-run equilibrium



Source: constructed myself analogically to [19]

Turning to the long-run equilibrium, there are two scenarios depicted in the Figure 2. Considering the first scenario, the housing demand $D1$ intersects with the long-run supply of housing $S1$, which is perfectly elastic, to determine an equilibrium $(Q1, P1)$. At the price $P1$, construction enterprises achieve the earnings they require. Figure 2 illustrates that the rightward shift of the demand for housing $D1$ to $D2$ produces a new equilibrium $(Q2, P1)$. In order to satisfy the quantity demanded $Q2$ and generate more earning by increased production, actual and new construction enterprises enter into the market. The common assumptions of perfect competition in the market govern the procedure as long as the real house prices are equivalent to $P1$. Accordingly, it is emphasised that in the long-run housing demand factors affect the quantity of housing requested. Regarding the second scenario, the supply of housing $S2$ over the long run is positively elastic or upward sloping. On the one hand, the researcher Poterba explains this phenomenon by the presumption that the construction enterprises' primary concern is with the real house prices and the expenditures associated with the building processes. Additionally, the real price of housing positively influence the quantity produced, with the growth of housing corresponding to the increased output. Conversely, if the costs of inputs extend then the output is reduced. On the other hand, the researcher Salo justifies the essence of upward sloping supply over the long run by the economies of scale and the influence of various factors on the decisions of the construction enterprises that are summarized in the Table 2. [20]

Figure 2 illustrates the housing supply $S2$ and demand $D1$ in the long run, which intersection determines the long-run equilibrium $(Q1, P1)$. The growth of housing demand $D1$ driven by the rise of positively correlated external factors causes the rightward shift of the $D1$ curve to $D2$. Consequently, the new equilibrium $(Q3, P2)$ is formed and the real house prices increases from $P1$ to $P2$ by the interaction between demand for and supply of housing in the long-run. [20]

In summary, the functionality of factors affecting both housing supply and demand operate together to specify the equilibrium over the short run and long run. Despite the fact that this adjustment mechanism is employed to forecast the real house prices, the fluctuations in housing market occur more often. [20]

3.5. UK Housing Market

3.5.1. Land use restrictions in the UK

Land use policies primarily affect the supply of developable land, and consequently the supply of housing. Thereby, policymakers develop planning systems for towns, with a conceptual framework for land use regulation and control, balancing the preservation of nature, and the supply of developable land. [19] The post-World War II government introduced this system in the Town and Country Planning Act 1947. Since that time, it has been modified and reviewed. Nevertheless, the implementation of *greenbelts surrounding cities remained*. The greenbelts were developed with an intention to prevent urban expansion, and sustain the development of other cities by encouraging people and businesses to reside there. *From an economic perspective*, the persisting greenbelts have generated several issues. Firstly, the restriction to construct within greenbelts has stimulated a limited supply of land that has put pressure on prices for real estate in urban areas and suburbia. This has been intensified by a growth of both population, and the incomes of households. Secondly, the city area has been dissipated, because the area on the other side of greenbelts has been improved and grown. Thirdly, households with revenue below the country's average are severely affected, because the majority of them have leased the housing, and are charged by landlords. On the contrary, landowners have been making gains, due to increasing prices of both housing and rents. The second regulation, which is a type of zoning, was implemented in 1967, and is known as "Conservation areas." The concept of it prohibits the landowners to destroy or rebuild real properties classified as properties of "architectural or historical interest." However, the owner has been allowed to maintain the property if approval from authority is received. Thereby, limited rights affect landowners, and reduce the supply of land for new developments. In addition, the politics of earlier planning system was reducing the density of buildings per hectare in residential sectors. [4] On the contrary, increase of dwellings' density per an area have been recently implemented in policies, as a result from regulations concerning the *global warming, contributions of carbon dioxide emitted by the automobiles, and land preservation*. [19] Therefore, it adversely influences the quality of households' life.

Land use policies are a governmental instrument to regulate and control the developments on the real property market. However, Evans and Home proved the inefficiency of current land use planning policies and regulations, which generate economic and social issues in the country.

3.5.2. Shortage in supply of housing

During the last three decades, the UK housing market has been characterized by volatile house prices. Many studies have been done to analyze and identify the roots of this phenomenon. Housing market research was provided by economist Barker in year 2004, who specified that *undersupply of housing over the long term* is the primary reason of the house prices unsustainable growth. During the last 30 years, the UK housing market has suffered from a shortage in supply that declined by more 12.5 % in period from 1992 to 2002. Such historically low rates of construction were induced by land use restrictions. Pressure from increasing long-run demand for housing, predominantly driven by population and income growth, generates intensive real house price inflation. Indeed, over the period from late-1970s to early-2000s the UK average rate of real house price sustained a growth of 2.4% per annum, which is relatively large compared to the average rate in the EU of 1.1%. This tendency denotes that 5000 additional households per year will not be able to enter the housing market by 2011. Therefore, Barker recommended increasing the supply of housing by 120000 dwellings annually. Nevertheless, the recent study initiated by a research team of The Building and Social Housing Foundation, has demonstrated that the housing supply has been considerably reduced since the start of the financial crisis, where the demand for housing continues to increase, resulting in an unstable housing market. Both studies specified that the overpriced housing market results in the *social and economic issues* of unaffordable homeownership, overcrowding, and unstable economic environment in the country. In conclusion, it was suggested to reconsider the current housing policies, to redevelop deserted dwellings, and to provide available funding options for both suppliers and demanders. It also provided formulated recommendations that would assist in balancing the market. [1] [3]

3.5.3. Microeconomic Perspective on the UK housing market Volatility

Analysts have provided empirical evidence that from microeconomic perspective the *information asymmetry, transactions costs, speculation, changes in tax rates and de-regulations of financial policies, which* affect the decision of individuals to purchase housing, intensify the volatility of the UK housing market. [16] [20] The influences of these variables are listed below:

- ***Information asymmetry*** in the context of housing market denotes that purchasers and sellers obtain imperfect information about current state of housing market and do not know the actual motives, which direct each side to participate in transactions. Furthermore, purchasers are incompletely informed about all risks associated with unstable market conditions and the qualification of particular dwelling, whereas sellers and lenders receive restrained information about purchasers' income. [16] Therefore, real estate agents are hired to avoid the information asymmetry. However, such decisions are expensive, and in some cases unreliable. As a result, sellers establish unreasonable house prices in the market, that generates volatility. [20]
- ***Transaction costs*** are associated with large expenditures that occur during the purchase of housing. Thereby, households tend to constrain the number of house purchases. In addition, the purchase is postponed until the situation in the housing market becomes beneficial for the buyer. [16] Particularly, when the prices of housing starts increasing compared to the equilibrium price, households decide to purchase housing despite transaction costs, what generates is *rapid growth of house prices*. This phenomenon is known as "*threshold effect*", which emphasizes that large transaction costs generate instability in housing market. [20]
- ***Speculation*** is characterized by episodes, where individuals invest in housing and do not account for equilibrium price. The primary purpose of such investments is to obtain capital gains in the short term. Therefore, it is affirmed that speculation in the housing market is damaging not only for the housing market, but also for the whole economy. [20]
- ***Changes in tax rates*** refer to the de-regulation of tax policies that result in a sudden increase in housing demand followed by an appreciation of house prices. [20] A similar scenario arose in the UK, when the Mortgage Interest Relief was introduced at

Source or MIRAS and reconsidered Council tax. Both policies aimed on encouraging home-ownership that lead to increased demand for housing. Nevertheless, it also enhanced volatility of house prices succeeding in a “mini-boom,” which was originated when the MIRAS was abolished. [16]

- *De-regulation of financial policies* in the UK was initiated, when Thatcher became prime minister. Liberalization of the credit market and reconsideration of fiscal policies have exacerbated the instability of the housing market. Moreover, these regulations resulted in increased availability of mortgages and new lenders entering the financial market. However, such tendencies caused a rise in demand for loans, which was accompanied by an *increase in interest rates, and a number of risky loans and household debts*. Indeed, *the number of repossessions was growing dramatically*, while the most severe impact was on households with unstable working positions and large debts. [16]

- *Herding theory* is specified by Keynes as a pattern of acts that individuals adopt during the periods of ambiguity. Such behaviour is performed in accordance with public decision-making, and it is assumed that the public has advanced knowledge and there is safety in numbers. Regarding the housing market, unreasonable valuation of dwellings occur in the market due to the fact, that households price their dwellings purely based on the decisions of other households. [16]

3.5.4. Boom-Bust episodes of UK housing market

Volatility in the UK housing market extends untenable expansion and magnifies negative impacts of contraction. [1] Therefore, the residential market is associated with interchangeable boom-busts episodes. *Booms* occur when the real house prices' increase is extensive and long-term, and exceeds the historical trend considerably. On the contrary, *busts* denote the ample and continuous decrease of real house prices by significant value from the long-run trend. [14]

The research of Agnello and Schuknecht proves the susceptibility of the UK residential market to the volatility. During the study, the “triangular methodology” was employed to designate booms and busts incidents. This method is a comparison analysis of severity, magnitude, and the persistence of expansion and contraction in the housing market among a sample of countries. The persistence is measured as the number of

years proceeded during booms and busts, whereas the magnitude signifies the percentage change of real house prices from the lowest point to the highest and from the highest point to the lowest. The severity denotes the aggregate variation of the real house prices from the historical trend. It comprises magnitude and persistence, and is equal to the area of the triangle, where the magnitude represents the height and persistence indicates the base. The expansion period in the UK housing market between 1983 to 1989 has been associated with the 43.31% increase in real house prices from trough to peak, and a severity indicator of 151.592. Thereafter, it was followed by a recession from 1990 to 1996 characterised by a 56.85% decrease in real house prices and severity indicators of -198.991. [14] These episodes proceeded in the UK housing market primarily due to de-regulation of financial policies in the context of a undersupply of housing. [16]

The last boom period persisted for 8 years from 1997 to 2004, with a 47.58% growth of the real prices of dwellings and a severity indicator of 190.333. [14] Following, a recession in the UK housing market started in the year 2008, and was initiated by the collapse of the financial market. Notably, the crisis resulted from the US sub-prime mortgage market breakdown that was initiated by a considerable number of risky mortgages and increasing demand for funds accompanied with indiscretion of creditors and poor quality of loans. Since the banking network is globalized and interrelated, the collapse of the US credit market lead to uncertainty and distrust among financial institutions and investors worldwide. As a result, the Bank of England introduced restrictive policies limiting the availability of loans. This caused the rapid decline of investments in residential sector. [15]

To conclude, the UK group was referred to as “repeated boom busters,” because it experienced several booms and bust episodes during the last three decades. [14]

3.5.5. The housing market and macroeconomy

Various studies have been carried out on both national and local scales, and proved a “tightness” and interrelation of the housing market with business cycles, macroeconomy of the country and consequently with global economic status. These studies have demonstrated that the housing market is shaped by the growth of income, population

trends, unemployment rate, GDP, interest and inflation rates, mortgage availability, and policies and restrictions of credit markets. [14]

Economist Kenny argues that variations in the housing market should be accounted for while developing new monetary policies. The studies of Muellbauer and Murphy deduced that contraction of the UK economy, which was followed by a recession in the late 1980, resulted from mistakes in macroeconomic policies caused by an ignorance of housing as a parameter of the UK consumption function. Additionally, Kenny stated that “the housing market is a useful “nerve centre” for detecting aggregate excess demand.” The supply of housing in the short-run is fixed, thus the demand for housing will exceed supply that leads to inflation of house prices resulting in a volatile market. Rapid house price inflation results in increasing landowners’ confidence in expected levels of income, which leads to an increased demand for other goods and services reflecting in appreciation of inflation rate on macro-level. [20] It was estimated for the UK that a growth of house prices by 1% results in a supplementary £35 billion to the total value of residential assets and enhanced consumption expenditure by £2.45 billion. [3] Nevertheless, the outcomes of long-term pressure of high levels of inflation are economic instability, fluctuations of interest and exchange rates and volatility of commodity price levels, which unfavourably influence the overall state of economy. [20] Thereafter, when the periods of bursts replace the booms, the households’ spending is notably reduced. Consequently, the GDP is adversely influenced, and decreases by 0.2-0.85% annually for three subsequent years after each 10% decrease in prices for dwellings. [3]

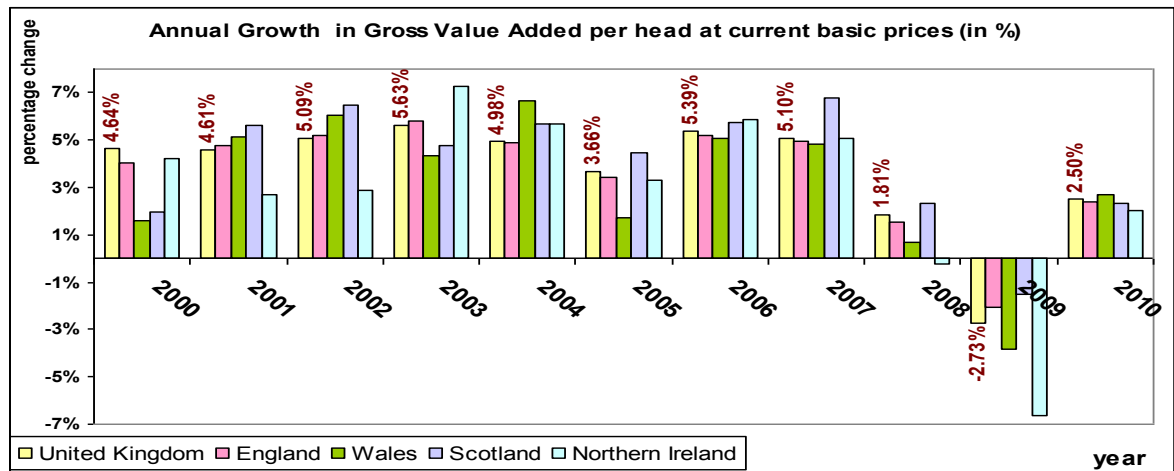
To summarize, the volatility in the residential market generates the instability of the macroeconomy, hence it adversely influences households, investors, businesses, and financial institutions. Moreover, it was observed in the UK that the most extensive economic cycles in the last three decades have been interconnected with the volatility of the residential market. [1]

4. The economic analysis of residential real estate market in the United Kingdom

4.1. The Macroeconomic Indices Reflecting the State of Housing Market

The Gross Value Added per head expresses the living standards of the overall population, and indicates the production output, aggregate demand, and phases of economic cycles in the country. Thereby, it reflects the developments in the housing market: the economic expansion is associated with appreciation of the dwellings prices and construction output, because of increase in demand for housing, and investments in the residential sector. On the contrary, the supply of and demand for housing is reduced when recession proceeds. Histogram 1 illustrates the GVA per head on a residence basis denoting that income distributed in accordance with the place of living. During the period from 2000 to 2008, the growth of GVA per head was positive signifying the increase in spending power of consumers, in production output, and the demand for goods and services. However, the economic downturn beginning in the last quarter of 2008 generated the negative growth in GVA per head in the year 2009. The Northern Ireland and Wales were the most severely affected by the collapse of the credit market, the annual fall in GVA per head was -6.65% and -3.82% respectively, whereas in England and Scotland it was equal to -2.09% and -1.52%. (Appendix: Table 5)

Histogram 1: Annual growth in Gross Value Added per head at current basic prices (in %)

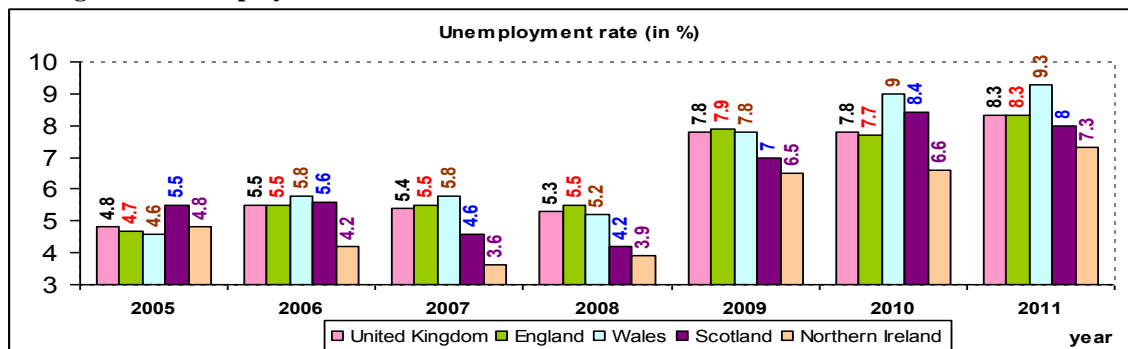


Source: own computation, [31]

During recession amount of subsidies, grants and pensions are decreased, while tax rates are increased. These measures are taken to balance the governmental budget.

Thereby, this recession adversely influenced all sectors of the economy, and overall consumer behaviour, since the aggregate demand for goods and services and quantity of investments were reduced. Moreover, the recession resulted in a rapid increase in unemployment rates, resulted from decrease in both rates of production, and demand for labour force. The UK *unemployment rate* is interpreted in Histogram 2. In accordance with the growth of GVA per head, the unemployment rate was relatively stable until the year 2008. Afterwards, there was observed a rapid rise during the period 2009-2011 in the UK. Thereby, the unemployment rate has increased from 7.8 % to 8.3% in the UK, from 7% to 8% in Scotland and from 7.9% to 8.3% in England. However, the highest level of unemployment has been monitored in Wales with a growth from 7.8% to 9.3%, whereby in Northern Ireland it reached 6.5 % in 2009 and 7.3% in 2011.

Histogram 2: Unemployment rate



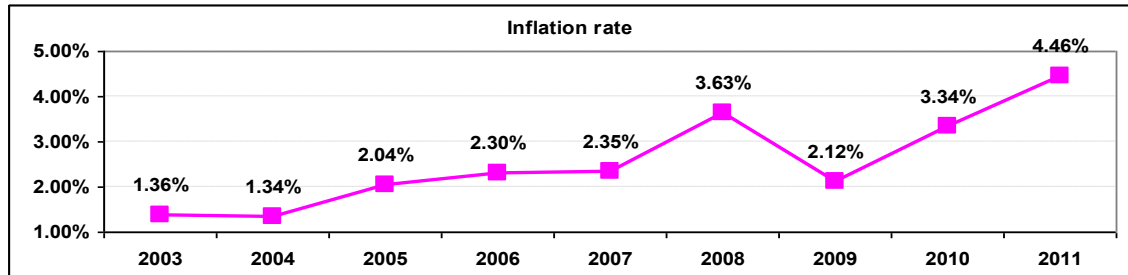
Source: histogram constructed based on data [33] [34]

The unemployment rate designates the phases of economic cycles, and influence consumer behaviour. The growth in unemployment leads to an unstable environment, and uncertainty in the future: people, who are not employed, are supported from past savings, people employed tend to spend less, and save more due to the risk of job loss. Therefore, the number of both investments in the residential sector, and purchases of dwellings by households is decreased. This results in an adverse impact on housing markets across all countries in the UK.

The impact of recession is also monitored while analyzing the inflation rate that reflects the overall price level in the country, and consumer behaviour. During the period from 2003 to 2008, the consumer spending was appreciating, illustrated in Graph 1. The inflation rate was 3.63% in the year 2008 signifying that demand for products was

rising, thus pushing the prices for goods and services to increase. The late-2000s crisis constrained the consumer spending power. As a result, the growth in commodity prices was moderate, and almost reached the Bank of England target of 2% in the year 2009.

Graph 1: Inflation rate



Source: own computation CPI (base year 2005), data from [31]

However, the inflation rate approached 4.46% in the year 2011, which was induced by rise in both VAT tax rate, and oil prices. [25]

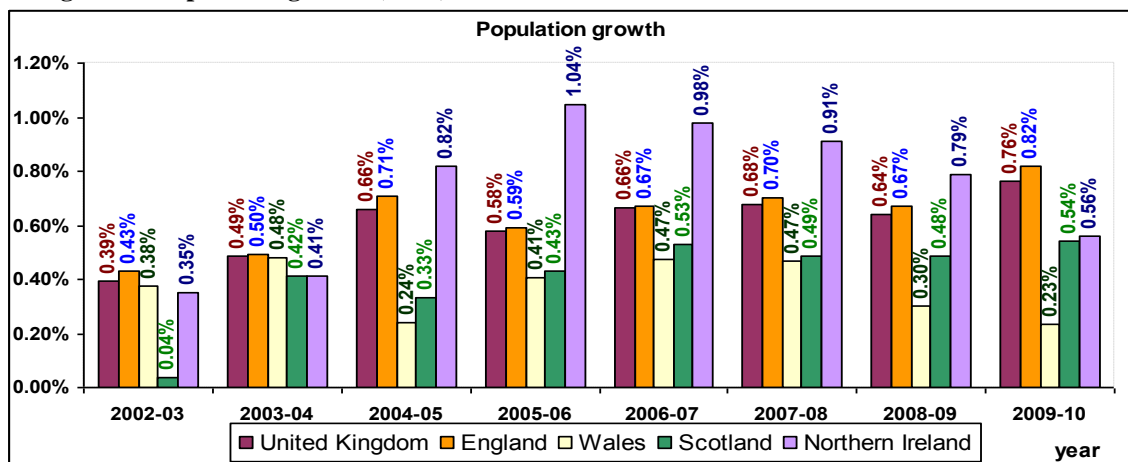
4.2. The Housing Demand Analysis

The demand analysis is associated with the study of both social and economic factors that guide consumer decisions. The unemployment rate and GVA per head that influence the behaviour of consumers have already been analyzed.

4.2.1. Demographic trends

The study of demographic trends encompasses the examination of population growth, net migration, and natural change in population. The UK growth of population is represented in Histogram 3.

Histogram 3: Population growth (in %)



Source: own computation, data from [32]

A long-term increase with an average annual growth of 0.61% is observed in the UK. This stable growth also occurred in England and Scotland. However, fluctuations appeared in Northern Ireland and Wales, with the highest growth of 1.04% proceeded in the year 2005-2006 and 0.47% in 2006-2008 respectively. The rates of population growth declined in both countries since those periods. The growth in population determines the increase in workforce and aggregate demand. Considering that it was rising in all countries, the demand for housing positively influenced.

The population growth is determined by natural change and net migration. The natural change reflects the change among live births and deaths in a year. The data for natural changes is presented in Table 3.

Table 3: Natural Change - Change among birth rates and death rates of population

financial year	United Kingdom	England	Wales	Scotland	Northern Ireland
natural change in thousands					
2001-02	61.9	63.5	-2.7	-6.1	7.2
2002-03	76.9	79.2	-2.7	-6.5	7.0
2003-04	104.0	101.8	-1.3	-4.0	7.4
2004-05	126.8	121.4	-0.3	-2.3	8.0
2005-06	158.7	148.9	1.9	-0.3	8.3
2006-07	186.9	174.4	2.3	1.1	9.1
2007-08	220.5	201.9	4.0	3.9	10.6
2008-09	216.5	198.0	3.3	4.6	10.6
2009-10	243.2	222.5	4.6	5.2	10.8

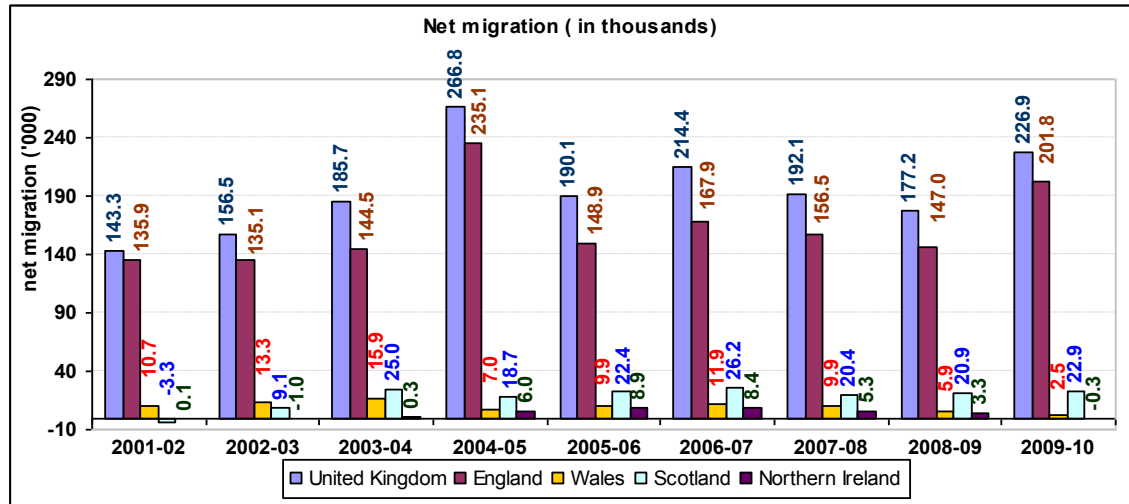
Source: selected data from [32]

The table illustrates that, the natural change was positive in the UK, England, and Northern Ireland during the last decade. However, the death rates were exceeding the number of births in Scotland and Wales until the years 2005-06 and 2006-07 respectively. This was followed by a positive natural change. The increasing rates of birth, and declining level of mortality indicate that the overall well-being of the country improved. Moreover, these tendencies signify that more space for housing has been required each year, generating a rise in the demand for housing.

The next determinant of population growth is migration rate, which is depicted in Histogram 4. The term net migration refers to the difference between migration inflows and migration outflows in a given period. In the UK, a decrease in net migration rate in the years 2005-06 and 2007-09 was observed. This was driven primarily by the diminished rate in England. In Scotland and Wales, net migration was increasing until

the year 2007-08, and then the rates of growth were slightly reduced. The positive net migration was enhanced in Northern Ireland during the period of 2003-2007. Afterwards, it started decreasing, and migration outflow exceeded the inflow in the year 2009-10.

Histogram 4: Net migration (in thousands) – Change in migration inflow and migration outflow



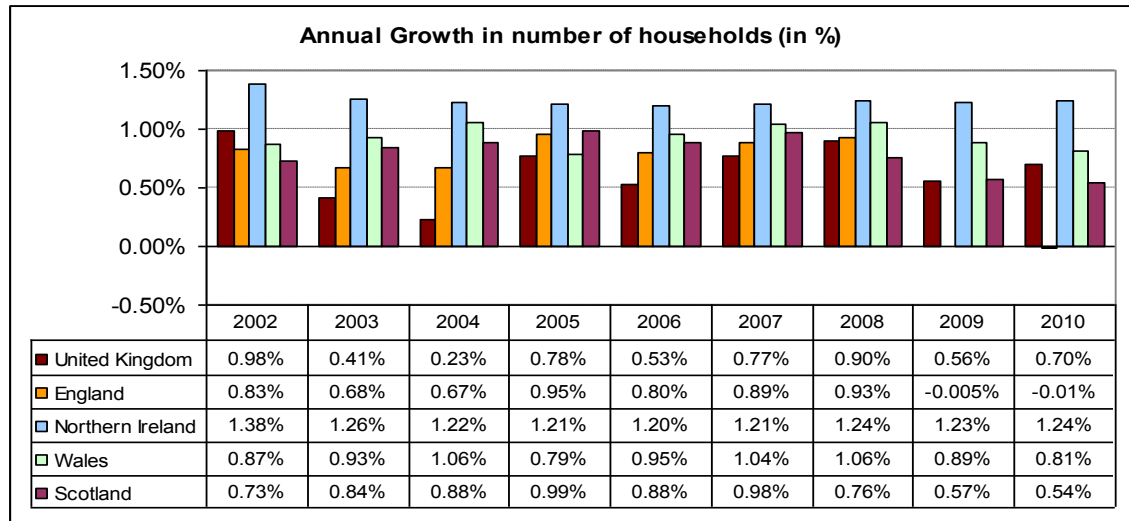
Source: Source: selected data from [32]

Immigrants are generally associated with the workforce, and demand for rents. There are number of reasons which may stimulate the decision to leave the country: high unemployment rates, insufficient income, unaffordable housing, obstacles in obtaining mortgage and high price levels. Therefore, both decline in migration inflow and growth in migration outflows adversely affect the housing market. The demand in housing market weakened in Wales and Northern Ireland during the years 2007-2010. However, the net migration improved in Scotland and England in the year 2009-2010, leading the increase in demand for housing in the UK.

4.2.2. The number of households

The growth in number of households is represented in Histogram 5. The growth rate was positive in the UK, Wales, Scotland, and Northern Ireland during the period from 2002 to 2010 denoting an increase in demand for housing. Nevertheless, a slightly negative growth occurred in England in the years 2009 and 2010. The economic stability in the country either motivates or discourages individuals to form households. Consequently, it has been observed that the economic crisis and rise of unemployment affected the households' decisions in the year 2009.

Histogram 5: Annual growth in number of households



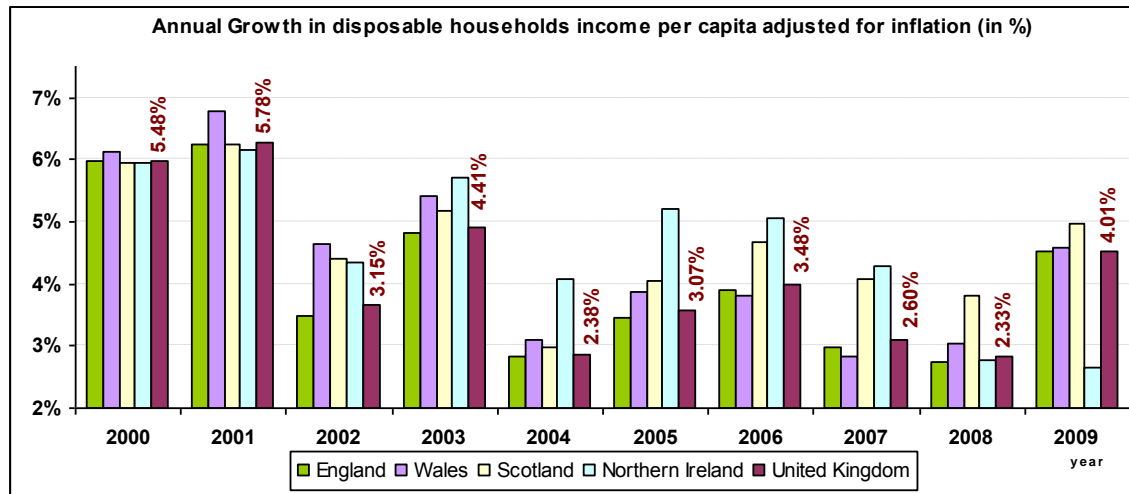
Source: own computation, data collected from [39]

Moreover, the restrictions imposed on borrowers by UK Banks have led to further difficulties with the mortgaging of housing. As a result, some households were dissolved in England, whereas other UK constituent countries experienced diminished rate of growth. The UK average value is still positive denoting that the demands for housing have been strengthened.

4.2.3. The real household disposable income per capita

The decision of households to purchase a dwelling is also shaped by the real income obtained and measures the well-being of the population. The high real income growth is associated with rising spending power of the population, but at the same time with appreciation in inflation rates. The more money households receive then more money is reflected on the market, resulting in increasing inflation rates. The annual percentage change in real household disposable income per capita is plotted in Histogram 6. The growth in real household disposable income per capita was the largest in the years 2000 and 2001. Afterwards, the rates of growth gradually declined, and low rates in the UK and England occurred in the year 2008 due to high inflation rates, and economic crisis. Northern Ireland was affected by the recession and unemployment, which led to reductions in sources of income. Thereby, the growth in income of 2.16% was registered in the year 2009. (Appendix: Table 6)

Histogram 6: Annual growth in real disposable household income per capita



Source: own computation, data from [39]

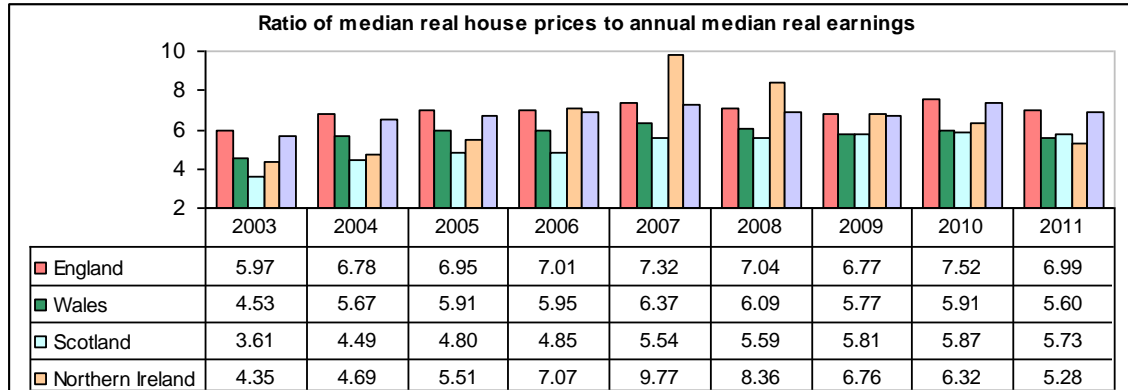
Besides, the household disposable income in other countries of the UK did not experience such diminished rates of growth. Since the growth in real household disposable income is still positive throughout the period 2002-2009, its influence on the housing market is not obvious, hence the examination of affordability ratios is required.

4.2.4. Affordability ratios

Price to income ratio and deposit to income ratio are classified as affordability ratios, measuring whether the purchase of housing is attainable for individuals. Price to income ratio is interpreted in Histogram 7. This ratio was computed based on data of dwelling median real price and median real earnings per year. The highest ratio was registered in Northern Ireland during the year 2007, and was equal to 9.77, denoting the rapid increase in house prices, which was almost 10 times higher than the annual income of individuals. After that, the ratio declined, and reached 5.28 in the year 2011. In Scotland, the stable growth in affordability ratio proceeded during the period from 2003-2010. During the period from 2003-2007, affordability ratio was rising in England and Wales, and was followed by a decrease in the year 2008. Evidently, the house purchase is unaffordable in UK constituent countries. The affordability improved in all countries in the year 2011, indicating the decrease in house prices. Nevertheless, the ratio is still at high levels: the house prices are from 5.28 to 6.99 times larger than the annual earnings of individuals in the year 2011. Thereby, it is apparent that the house

purchase is affordable only if households hold some capital saved during the past, or if a mortgage was obtained.

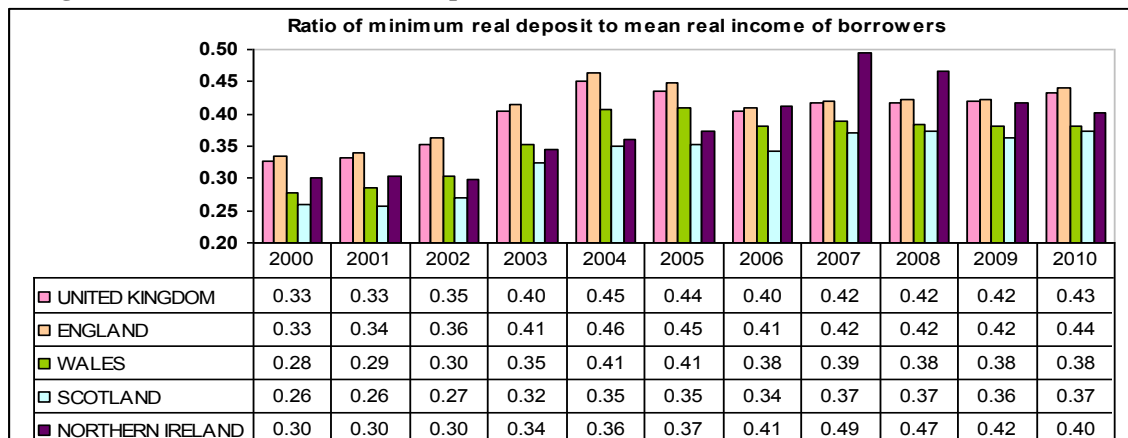
Histogram 7: Ratio of median real house prices to annual median real earnings



Source: own computation, data from [27] [39]

The next affordability ratio is deposit to income ratio, which is depicted in Histogram 8. The ratio was rising from the year 2000 till the year 2004 in the UK and England, and till the year 2005 in Scotland and Wales, and then it slightly declined. Regarding Northern Ireland, the growth of ratio was proceeding from the year 2000 till the year 2007, followed by a decrease.

Histogram 8: Ratio of minimum real deposit to annual mean real income of borrowers



Source: own computation, data from [27]

In comparison to the year 2009, the minimum deposit required by lenders increased in the year 2010, and reached 44 % of annual mean real income of borrowers in England, 40% in Wales, 37% in Scotland, and 38% in Northern Ireland. This ratio indicates

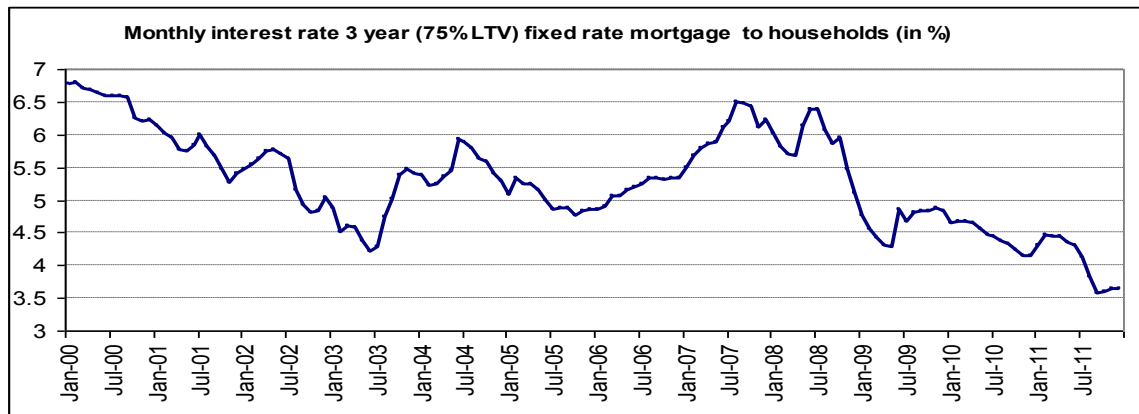
potential of buyers to obtain the mortgage. Thereby, individuals, who have savings, afford a purchase of housing through mortgaging.

To summarize, the study of affordability ratios suggests that households from England are the most affected due to high values of ratios, which go beyond the national average. However, the housing market in Northern Ireland is more volatile than in other UK constituent countries that is proved by rapid fluctuations of affordability ratios.

4.2.5. Financial institutions' regulations

The previous chapter proved that house purchases in the UK is directly dependent on the affordability of mortgages, since the prices for housing are much higher than the annual earnings of population. Consequently, the demand for housing responds to the policies on the financial institutions. The monthly interest rate of a 3 year fixed rate mortgage with a 75% loan to value ratio (LTV) offered to households by UK banks is depicted in Graph 2.

Graph 2: Monthly interest rate 3 year (75% LTV) fixed rate mortgage

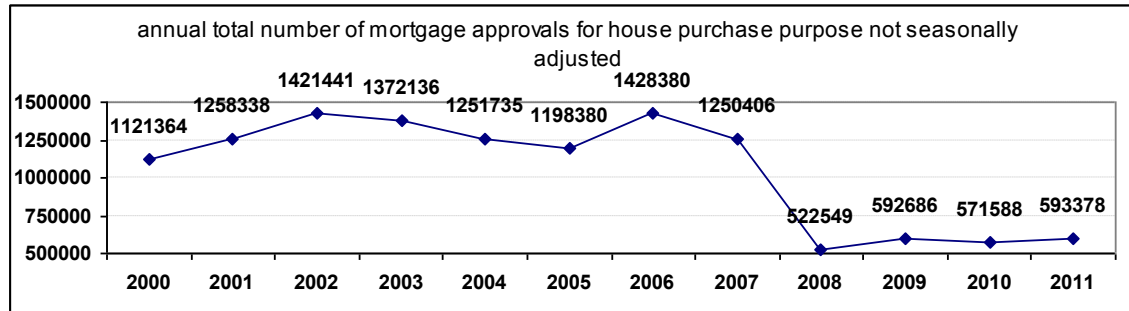


Source: constructed myself, data from [26]

During the periods from January-2000 to July-2003, and from July-2004 to the end of 2005, the interest rate were declining that enhanced the demand for funds, and hence for housing. (Appendix: Table 7 and Table 8) The restrictive policies of UK banks established in the year 2007 resulted in increasing interest rates until the July-2008 that generated reduced demand for mortgages. The interest rate started decline in the year 2009, and reached 3.6 % at the end of the year 2011, that was the minimum level in the last decade. Despite this fact, the households still experience complications with

attainability of mortgages, which is proven in Graph 3: representing the annual number of mortgage approvals for house purchase purpose.

Graph 3: Annual total number of mortgage approvals for house purchase purpose



Source: constructed myself based on data from [26]

The slight decrease in the number of mortgage approvals proceeded in the years 2003-2005, compared to the year 2002 reflecting the rise in interest rates. Afterwards, the total number of mortgage approvals reached 1428380 in the year 2006 indicating an increase in demand for housing. Later, a rapid decline in the number of mortgage approvals occurred in the year 2008 due to tight lending conditions, and started recession. As a result, it decreased by almost 2.39 times compared to the year 2007. Since that period, the number of mortgage approvals slightly improved, but it still less than 600000. Considering that the majority of households fund house purchase through mortgaging, the regulations in mortgage market have limited the chance of first time buyers to enter the market and of homeowners to move to another location.

Another example of the impact of financial institutions' regulations is the number of residential property transactions, with the annual percentage change is represented in Table 4. Accordingly, a decline in the number of transactions had started in the year 2007, and was intensified by financial crisis in the year 2008. Notably, the largest decrease was observed in Northern Ireland, where it reached -60.53% in the year 2008. In England and Wales, the decrease was approximately -45 %, and was slightly above the UK average of -44.24%. The number of property transactions in Scotland was reduced by 33.11% followed by a further decrease of 25.45% in the year 2009, whereas in the year 2010, it increased. Still, the value again declined in the year 2011, which indicates the weakened demand for housing.

Table 4: Annual percentage change in number of residential property transactions (in thousands) with value more than 40000 £

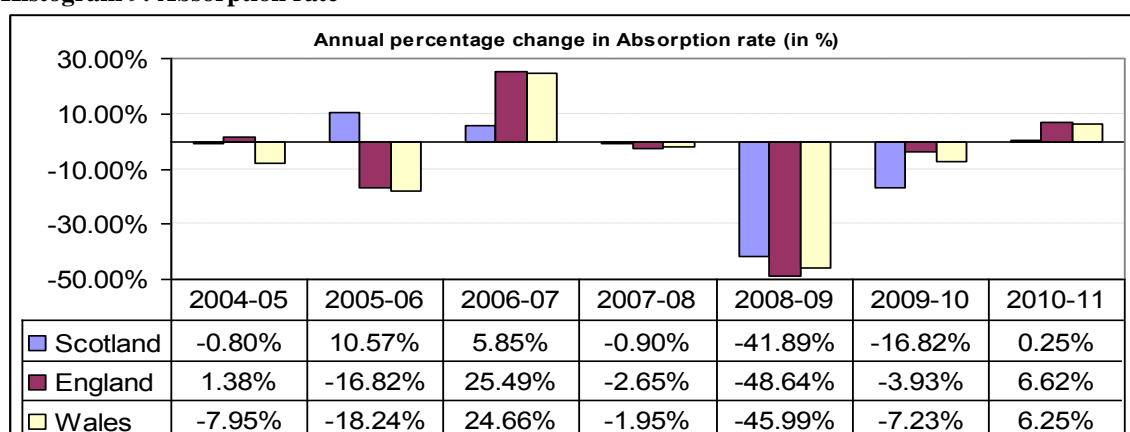
Annual percentage change in number of residential property transactions (in thousands) with value more than 40000 £					
	England	Scotland	Wales	NI Ireland	UK
2007	-3.13%	2.07%	-5.71%	-25.49%	-3.41%
2008	-44.82%	-33.11%	-45.45%	-60.53%	-44.24%
2009	-2.00%	-25.25%	-8.33%	0.00%	-4.56%
2010	3.53%	2.70%	0.00%	0.00%	3.14%
2011	-1.84%	-3.95%	0.00%	-6.67%	-2.14%

Source: own computation based on data [29]

4.2.6. Absorption rate

The absorption rate was only computed for England, Wales and Scotland, since the data for Northern Ireland is not freely available. As Histogram 9 illustrates, the absorption rate deteriorated in the year 2005-2006, and considerably increased in the subsequent year, reflecting fluctuations in interest rates. The worst decrease occurred in the year 2008 when the number of dwellings absorbed per month declined by approximately 42% in Scotland, 49% in England, and 46% in Wales.

Histogram 9: Absorption rate



Source: own computation, data from [30] [35]

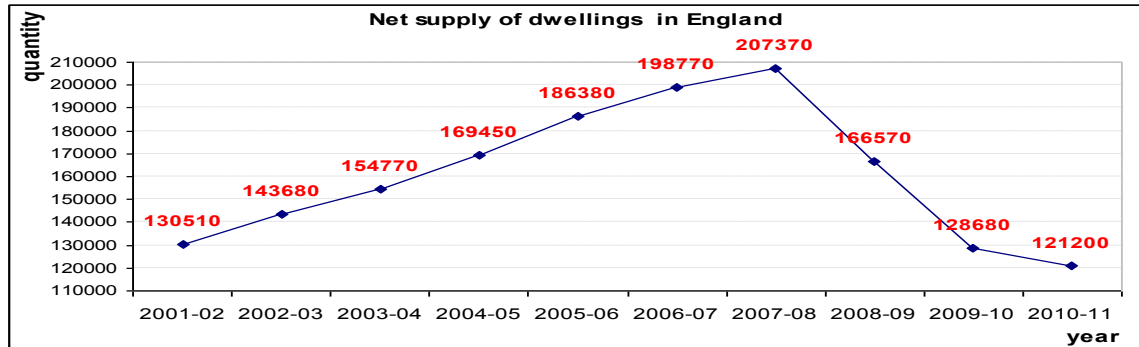
These outcomes highlight the considerable decrease in demand for housing. Despite the fact that absorption rates increased in the year 2010 compared to the year 2009, it is more than two times lower when compared to the year 2007.

4.3. Analysis of Housing Supply

4.3.1. Net supply of housing

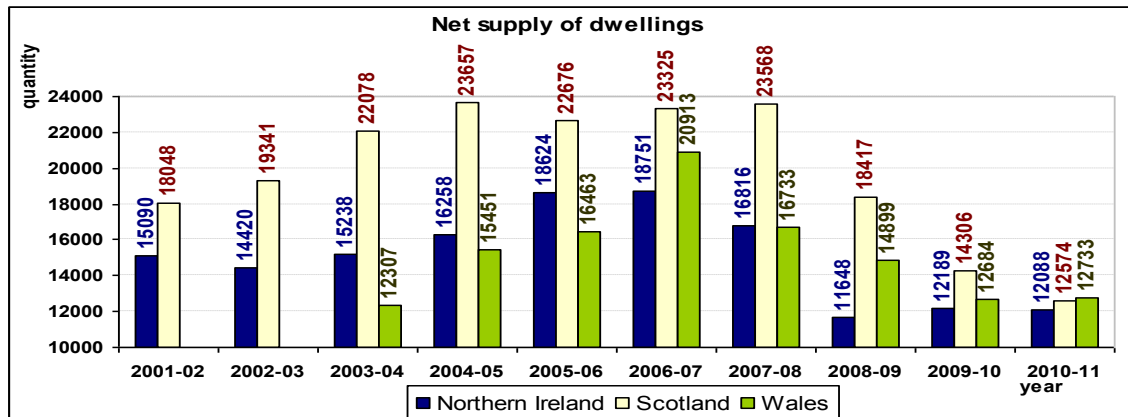
The number of net supply increased until the year 2008, as it is shown in Graph 4 and Histogram 10. These growths were predetermined by the rise in demand for housing, house price growth, and low interest rate. The highest number in net supply in Wales and Northern Ireland occurred in the year 2006-2007, whereas in other countries it proceeded in the year 2007-2008.

Graph 4: Net supply of dwellings in England



Source: own computation, data from [27]

Histogram 10: Net supply of dwellings in Wales, Northern Ireland and Scotland



Source: own computation, data from [27] [28] [37] [38]

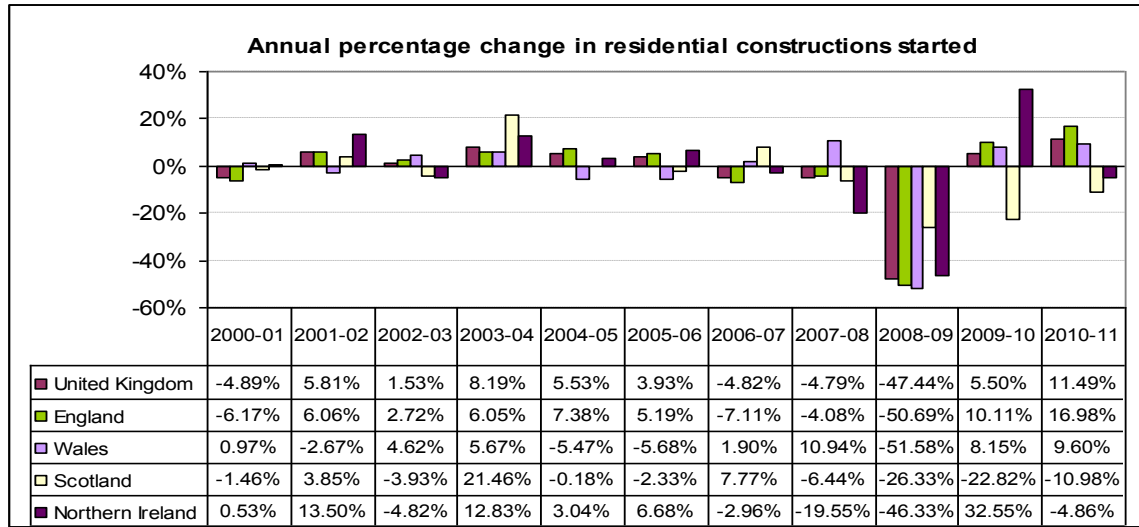
Afterwards, the rate of net supply has considerably decreased: during the period from 2008-2011 it declined in England by 42%, in Wales by 39%, and in Scotland by 47%. Regarding Northern Ireland, it was reduced by 38% from the year 2007-2009, and then slightly increased. Since land availability influences the net supply of housing, the restriction of land use in turn adversely affect it. Moreover, this issue accompanied with

a recession starting in the year 2008 lead to an undersupply in the housing market, where the pressure from demand generates the volatility of house prices. Despite the rising number of households, and a growth in disposable income, the net supply of housing was unresponsive.

4.3.2. Residential construction starts and construction completed

Construction starts and completes indicate the rate of developments in housing market, and reflect the supply of housing. Histogram 11 and Histogram 12 represent annual percentage change in residential construction starts and completes.

Histogram 11: Annual percentage change in residential constructions started



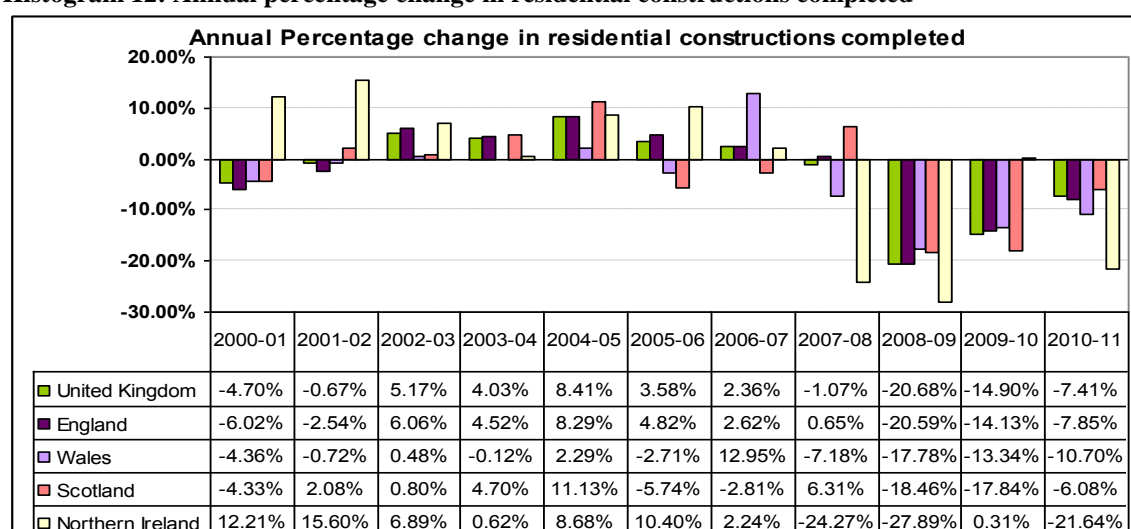
Source: own computation, data from [27]

The rates of construction starts were fluctuating in all countries during the period from 2000-2011. The unprecedented rates in the decline of construction starts occurred in the year 2008-2009 across the UK. The largest reduction was in Wales and England by -51.58% and -50.69%, respectively. The subsequent years, the rates of construction starts had risen in both counties. In Scotland, the downward trend has continued since the year 2007-2008, and reached the level of -26.33% in the year 2008-2009, and -22.82 in the year 2009-2010. In Northern Ireland, the decrease in construction starts was equal to -46.33% in the year 2008-2009 followed by a rise of 32.55% in the year 2009-2010, and then it again declined. The decline in construction starts was generated by the low availability of land for developments, and was intensified by the recession and an

increase in interest rates during the period from 2007-2008, resulting in reduced investments in the house building industry. The rates of constructions starts reflect the supply of housing in the future. Accordingly, the diminishing rates indicate the decrease in supply of housing. Moreover, the housing market suffers from undersupply, resulting in an unstable environment, and volatile house prices. Considering such a severe fall in construction starts, the housing market requires more time to recover.

The amount of construction completes is directly related to the number of construction starts in the past, and denotes the amount of new dwellings supplied to the market.

Histogram 12: Annual percentage change in residential constructions completed



Source: own computation, data from [27]

The stable growth in construction completes in Northern Ireland proceeded from the 2000-2001 to 2006-2007, whereas in England it occurred in the years 2002-2007, and in Scotland during period from 2001-2004. Afterwards, these countries experienced a continued reduction in construction completes that followed the trends of construction starts. The decline periods in Wales appeared more often than periods of growth. Since the construction completes represent the vast share of net supply of housing in the market, it is evidential that all countries in the UK suffer from a shortage in the supply of housing. The most affected are Wales and Northern Ireland, where the total decline in construction started was 33.9% and 34.5% respectively in the year 2010-2011 compared to the year 2000-2001, while in England the reduction was by 20.5%, and in

Scotland by 26.7 %. These tendencies emphasize the unresponsiveness of housing supply to the increasing demand for housing.

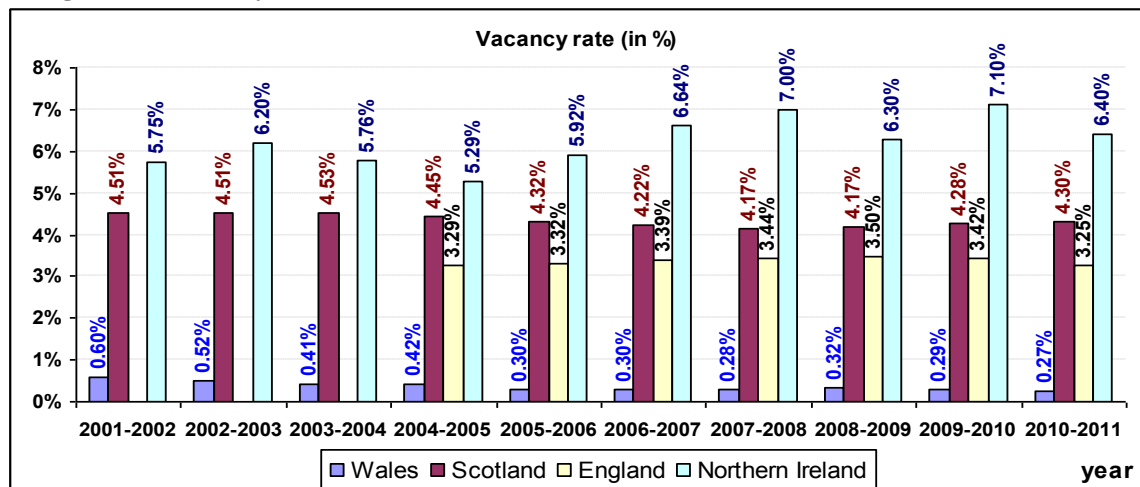
Therefore, it is apparent that the housing markets in the UK are suffering from a shortage in the supply of housing, which generates the imbalance in house prices.

4.4. The Analysis of Balance Between Supply and Demand in the Housing Market

4.4.1. Vacancy rate

The vacancy rate in the housing market reflects the equilibrium between the supply of and demand for dwellings. Histogram 13 represents the vacancy rate in the UK housing market. The natural vacancy rate in the UK housing market is 3.86%, and represents the long-term trend.

Histogram 13: Vacancy rate (in %)



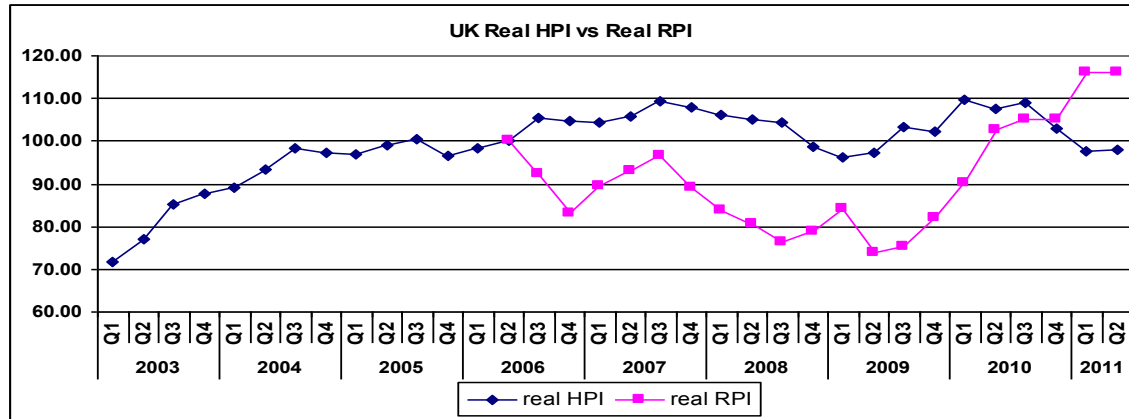
Source: own computation, data from [27] [28] [37] [38]

Accordingly, the long-term trend of vacancy rates in Wales is 0.38%, whereas it approaches 3.37% in England, 4.35% in Scotland, and 6.34% in Northern Ireland. Correspondingly, these trends denote that the largest deficit in supply of housing is experienced by the housing market in Wales, where almost all dwellings are occupied. Regarding England, the vacancy rate is approximately equal to the natural vacancy rate. However, it is still lower indicating the undersupply. On the contrary, in Northern Ireland and Scotland the vacancy rates exceed the long-term average of the UK, denoting that there is an economic oversupply. The concept of economic oversupply shows that the house purchase is not affordable for households resulting in increased levels of vacant stock. [10]

4.4.2. The real house prices and real rent prices

The price index represents how the price changes in a given period compared with the base period. The third quarter of the year 2006 was chosen as the base period. The median house prices and simple average rent prices were gathered to estimate the real house price index (HPI) and real rent price index (RPI) that are delineated in Graph 5.

Graph 5: UK real house price index and real rent price index



Source: own computation, data from [27] [31] [36]

The rising tendency of house prices is observed from the year 2003 until the third quarter of 2007. During this period the real house prices increased by 1.52 times. Later, it started to decline, and reached in the 1st quarter 2009 the same level as in the 4th quarter 2005. These were explained by the financial regulations, considerable decrease in GVA per head, and rising unemployment which resulted in a weakened demand for housing. Moreover, the demand for housing tends to level up if the economic environment and housing market are stable, and prices are expected to rise in contrast to periods of uncertainty and instability when demand decreases. Nevertheless, this decline was followed by an increase in real house prices until the 1st quarter 2010, which was induced by the rapid reduction in housing supply. Considering that financial regulations were still imposed on borrowers, and unemployment rates were rising, house prices decreased again in the 3rd quarter 2010, and continued in the 1st and 2nd quarter 2011, until it reached the same level as in the base year.

The rent prices were below the base period level until the 2nd quarter of 2010. However, the rapid increase occurred in the 2nd quarter of 2009. Thereby, households, who still demand housing, but did not have enough savings, or who experienced difficulties with

obtaining mortgages, were indirectly enforced to lease housing, thus generating pressure on rent prices.

Analogically, the real house price index (HPI) and real rent price index (RPI) was computed for England, Wales and Scotland with a base period of 2nd quarter 2006, and for Northern Ireland with a base period of 2nd quarter 2009. (Appendix: Graph 6, Graph 7, Graph 8, Graph 9) Accordingly, in Wales and England there were proceeding cyclical fluctuations of real house prices. Notably, the growth in house prices continued until the 3rd quarter 2007 when it increased by 43.75% in England and by 63.04% in Wales, in comparison to the 1st quarter of 2003. Similarly to periods of the UK real house price variations, the housing market in England and Wales experienced declines and increases. Regarding the real RPI, in England the rapid increase has been observed since 3rd quarter 2009, and almost corresponds to the growth in UK real RPI, whereas in Wales after a growth of 34% from the 1st quarter of 2007 to the 3rd quarter 2008, the real rent prices decreased by 23.66%, and remained at relatively the same level. Moreover, the correlation of real house prices and real rent prices is noticeable: the decrease in house prices is reflected by an increase in rent prices. Correspondingly, this relation is observed among Scotland real HPI and real RPI. (Appendix: Graph8) The real house prices were amplified until the year 2010. As a result, it rose by 2.21 times from the 1st quarter 2003 to the 4th quarter 2009, and emphasizes low affordability, and economic oversupply. Following, it slightly decreased by 8.9% till the 2nd quarter of 2011. Regarding Northern Ireland, the 3rd quarter 2009 was chosen as a base period, because the earlier rent price data was not available. (Appendix: Graph 9) The largest unsustainable real house price appreciation was experienced in the Northern Ireland housing market, where it rose by 2.63 times from the 1st quarter of 2003 to the 3rd quarter of 2007, followed by a rapid reduction of 48% till the 2nd quarter 2011. Deregulations of credit market policies generated this volatility, which resulted in a collapse of the housing market. Turning to real RPI, the enlargement of real rent prices is observed during the 2nd and 3rd quarters of 2010, followed by a decrease in rent prices.

4.5. Discussion and Recommendation

The current economic downturn and rising unemployment rates weakened the aggregate demand for goods and services. Consequently, housing markets across all UK constituent countries were negatively influenced.

The analysis of housing demand detected the slightly negative growth in number of households that occurred in England during the years 2009 and 2010. This was induced by unstable economic environment when recession started. However, the rate of growth in other UK constituent countries is positive denoting rise in demand for housing. The increasing population and birth rates, together with the growth in annual real household disposable income have enhanced the housing demand across the UK. The analysis has emphasized that the housing purchase decisions of households are governed by the affordability of mortgages. However, the UK average ratio of minimum deposit to annual mean real income of borrowers was 0.43 in the year 2010, slightly increased compared to the year 2009. Thereby, only those households, who hold saved capital, regular income and satisfy requirements of lender, have a chance to obtain a 90 % loan to value mortgage (i.e. minimum deposit). Furthermore, it was signified that it is more difficult to purchase dwelling in England than in other UK constituent countries, because values of price to income ratio have been exceeding the national average. The analysis of housing demand has affirmed that regulations of financial institutions severely affected the potential buyers of housing across the UK, who have been enforced to postpone the purchase and to increase savings by limiting consumption of goods and services.

The analysis of housing supply has verified that the UK constituent countries experience the shortage in supply of housing that was influenced by land use restrictions and intensified by reduced investments in construction industry resulted from recession. Accordingly, sharp reduction in net supply of housing occurred in the years 2007-2011, which was caused by diminishing rates of construction starts and completions.

The examination of vacancy rates, which reflects the equilibrium between supply of and demand for housing, confirmed the instability of housing markets across the UK. Accordingly, economic oversupply persists in Scotland and Northern Ireland, whereas

long-term shortage in supply proceeds in England and Wales. The study of real house price indices and real rent price indices emphasized the correlation of house prices with rent prices. The outcome showed that rent prices tend to increase when house prices decrease. This relation is applied only if households face restrictions in the mortgage market and affordability ratios increase. Additionally, it was signified that inadequate house price growth until the year 2007 was intensified by the unresponsiveness of housing supply to the rising demand for dwelling, and liberalization in the credit market. The households from Northern Ireland were most severely affected, whereas in other countries the amplitude of house price growth and decline was less. Moreover, housing markets in England, Wales, and Scotland had shown signs of recovery during the 2nd quarter of 2011. Nevertheless, it is proved that the durability of the recession period in the market tends to be equal or slightly higher than the period of growth. [11] Thus, it is assumed that UK housing markets require at least 8 years to recover, because the latest boom phase proceeded from the year 1997 till the year 2004.

Recommendations

The volatility in the housing market will diminish if the housing supply is responsive to the demand for dwellings, and financial policies are reviewed. Therefore, an increase in the supply of land for developments is required. Consequently, the politics of land use restrictions should be reviewed. Moreover, government should release pressure from the large cities by providing more jobs places in less densely populated towns. Thereby, it would encourage people to move from urban areas. Additionally, the banks should establish policy balancing restrictive and de-regulative policies. They should control the quality of loans, offer a long-term fixed rate mortgages and keep interest rates at low levels.

Limitations of analysis:

This bachelor thesis do not explains all reasons of housing markets volatility due to limited availability of data and scope of this work. The housing market is affected by much wider set of social and economic factors. Additionally, any secondary data include the probability of bias, even the data collected from statistical offices.

5. Conclusion

This bachelor thesis determined the impact of macro-and micro-economic indicators on demand and supply sides that assisted to evaluate the current housing market state. In addition, the comparison analysis among countries was provided.

The literature review suggests that instability in the UK housing market have been induced by high transaction costs, speculation, changes in tax rates, financial institutions' policies, information asymmetry, and a "herding effect." The influence of these factors has been intensified in the periods of economic instability. Moreover, researches have signified that long-term shortage in supply of housing causes volatility of house prices across the UK. Furthermore, it was determined that prolonged volatility in housing markets generates unstable economic environment on regional and national scales. Correspondingly, fluctuations of the national economy influence the overall demand and supply in housing markets.

The analysis has proved that housing markets across the UK is currently in the phase of recession, which was initiated by the collapse of credit market. However, the demand for housing has been enhanced due to increase in population and growth in income. In addition, it was deduced that mortgage affordability and financial institutions' regulations determine the chance of individuals to acquire housing. Thereby, the current restrictive policies of UK banks across generated rapid decline in residential real property transactions. Furthermore, the analysis confirmed the shortage in supply of housing in all UK constituent countries, which was initiated by diminishing rates of both construction completions and starts. Subsequent studies of vacancy rates, real house price indices and real rent price indices derived that housing markets across the UK are misbalanced.

Therefore, the analysis defined that shortage in supply of housing and changes in policies of financial institutions generate volatility in the UK housing markets. Consequently, it is recommended to increase the supply of land by reviewing the land use policies and motivate people to move from cities by offering more job vacancies in smaller cities. Additionally, banks should find the right balance between restrictive policies and policies directed toward liberalization of credit constraints.

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7. Appendix

Table 5: Annual growth in Gross Value Added per head at current basic prices (in %)

Annual Growth in Gross Value Added per head at current basic prices (in%)					
	England	Wales	Scotland	Northern Ireland	United Kingdom
1998	5.92%	3.63%	5.72%	4.46%	5.47%
1999	4.76%	4.54%	3.01%	7.93%	4.85%
2000	4.03%	1.61%	1.96%	4.22%	4.64%
2001	4.78%	5.11%	5.64%	2.71%	4.61%
2002	5.21%	6.06%	6.45%	2.91%	5.09%
2003	5.82%	4.32%	4.75%	7.27%	5.63%
2004	4.90%	6.63%	5.67%	5.69%	4.98%
2005	3.42%	1.75%	4.47%	3.30%	3.66%
2006	5.20%	5.09%	5.75%	5.84%	5.39%
2007	4.96%	4.81%	6.77%	5.07%	5.10%
2008	1.53%	0.70%	2.33%	-0.25%	1.81%
2009	-2.09%	-3.82%	-1.52%	-6.65%	-2.73%
2010	2.37%	2.72%	2.34%	2.05%	2.50%

Source: own computation, data from [30]

Table 6: Annual Growth in Real Household Disposable Income (in %)

Annual Growth in Real Household Disposable Income (in %)					
	England	Wales	Scotland	Northern Ireland	United Kingdom
1998	4.65%	3.23%	3.58%	3.81%	4.48%
1999	4.07%	3.67%	3.26%	3.97%	3.99%
2000	5.48%	5.64%	5.47%	5.46%	5.48%
2001	5.76%	6.30%	5.76%	5.66%	5.78%
2002	3.00%	4.14%	3.91%	3.85%	3.15%
2003	4.34%	4.93%	4.68%	5.23%	4.41%
2004	2.34%	2.59%	2.47%	3.58%	2.38%
2005	2.96%	3.37%	3.56%	4.70%	3.07%
2006	3.40%	3.31%	4.17%	4.57%	3.48%
2007	2.48%	2.34%	3.59%	3.80%	2.60%
2008	2.24%	2.55%	3.30%	2.28%	2.33%
2009	4.02%	4.08%	4.47%	2.16%	4.01%

Source: own computation, data from [30]

Table 7: Monthly interest rate 3 year (75% LTV) fixed rate mortgage (1st part)

31-Jan-00	6.78	31-Jan-02	5.47	31-Jan-04	5.38
29-Feb-00	6.8	28-Feb-02	5.53	29-Feb-04	5.22
31-Mar-00	6.7	31-Mar-02	5.62	31-Mar-04	5.23
30-Apr-00	6.68	30-Apr-02	5.74	30-Apr-04	5.36
31-May-00	6.64	31-May-02	5.76	31-May-04	5.44
30-Jun-00	6.6	30-Jun-02	5.7	30-Jun-04	5.93
31-Jul-00	6.58	31-Jul-02	5.64	31-Jul-04	5.88
31-Aug-00	6.59	31-Aug-02	5.16	31-Aug-04	5.79
30-Sep-00	6.56	30-Sep-02	4.91	30-Sep-04	5.63
31-Oct-00	6.25	31-Oct-02	4.8	31-Oct-04	5.59
30-Nov-00	6.21	30-Nov-02	4.82	30-Nov-04	5.4
31-Dec-00	6.23	31-Dec-02	5.04	31-Dec-04	5.28
31-Jan-01	6.13	31-Jan-03	4.88	31-Jan-05	5.09
28-Feb-01	6.01	28-Feb-03	4.51	28-Feb-05	5.32
31-Mar-01	5.95	31-Mar-03	4.59	31-Mar-05	5.24
30-Apr-01	5.77	30-Apr-03	4.57	30-Apr-05	5.25
31-May-01	5.74	31-May-03	4.38	31-May-05	5.15
30-Jun-01	5.84	30-Jun-03	4.2	30-Jun-05	5
31-Jul-01	5.99	31-Jul-03	4.28	31-Jul-05	4.85
31-Aug-01	5.82	31-Aug-03	4.73	31-Aug-05	4.88
30-Sep-01	5.68	30-Sep-03	5.02	30-Sep-05	4.88
31-Oct-01	5.46	31-Oct-03	5.37	31-Oct-05	4.77
30-Nov-01	5.26	30-Nov-03	5.47	30-Nov-05	4.84
31-Dec-01	5.39	31-Dec-03	5.4	31-Dec-05	4.86

Source: selected myself based on data from [26]

Table 8: Monthly interest rate 3 year (75% LTV) fixed rate mortgage (2nd part)

31-Jan-06	4.85	31-Jan-08	6.02	31-Jan-10	4.64
28-Feb-06	4.9	29-Feb-08	5.81	28-Feb-10	4.68
31-Mar-06	5.05	31-Mar-08	5.69	31-Mar-10	4.68
30-Apr-06	5.06	30-Apr-08	5.67	30-Apr-10	4.65
31-May-06	5.14	31-May-08	6.13	31-May-10	4.56
30-Jun-06	5.2	30-Jun-08	6.39	30-Jun-10	4.46
31-Jul-06	5.23	31-Jul-08	6.39	31-Jul-10	4.45
31-Aug-06	5.33	31-Aug-08	6.06	31-Aug-10	4.36
30-Sep-06	5.33	30-Sep-08	5.86	30-Sep-10	4.33
31-Oct-06	5.3	31-Oct-08	5.95	31-Oct-10	4.24
30-Nov-06	5.32	30-Nov-08	5.47	30-Nov-10	4.15
31-Dec-06	5.32	31-Dec-08	5.11	31-Dec-10	4.15
31-Jan-07	5.48	31-Jan-09	4.76	31-Jan-11	4.3
28-Feb-07	5.67	28-Feb-09	4.56	28-Feb-11	4.47
31-Mar-07	5.78	31-Mar-09	4.41	31-Mar-11	4.44
30-Apr-07	5.86	30-Apr-09	4.3	30-Apr-11	4.43
31-May-07	5.88	31-May-09	4.29	31-May-11	4.34
30-Jun-07	6.12	30-Jun-09	4.86	30-Jun-11	4.31
31-Jul-07	6.21	31-Jul-09	4.67	31-Jul-11	4.13
31-Aug-07	6.5	31-Aug-09	4.81	31-Aug-11	3.82
30-Sep-07	6.47	30-Sep-09	4.82	30-Sep-11	3.58
31-Oct-07	6.42	31-Oct-09	4.82	31-Oct-11	3.6
30-Nov-07	6.1	30-Nov-09	4.88	30-Nov-11	3.64
31-Dec-07	6.22	31-Dec-09	4.84	31-Dec-11	3.63

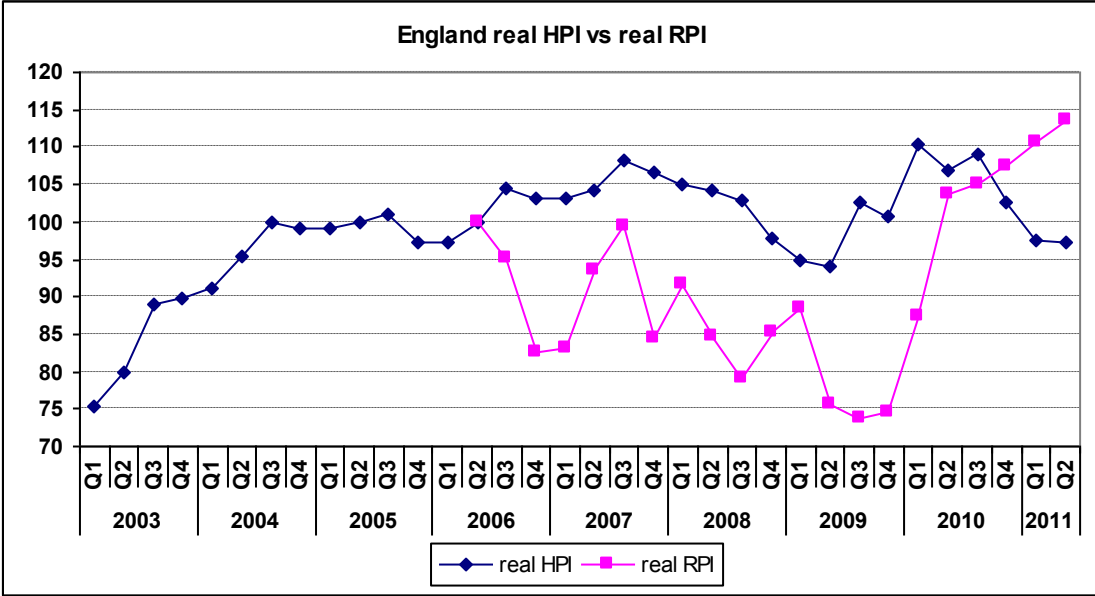
Source: selected myself based on data from [26]

Table 9: Number of residential property transactions (in thousands) with value more than 40000 £

Number of residential property transactions (in thousands) with value more than 40000 £					
	England	Scotland	Wales	N Ireland	UK
2006	1405	145	70	51	1671
2007	1361	148	66	38	1614
2008	751	99	36	15	900
2009	736	74	33	15	859
2010	762	76	33	15	886
2011	748	73	33	14	867

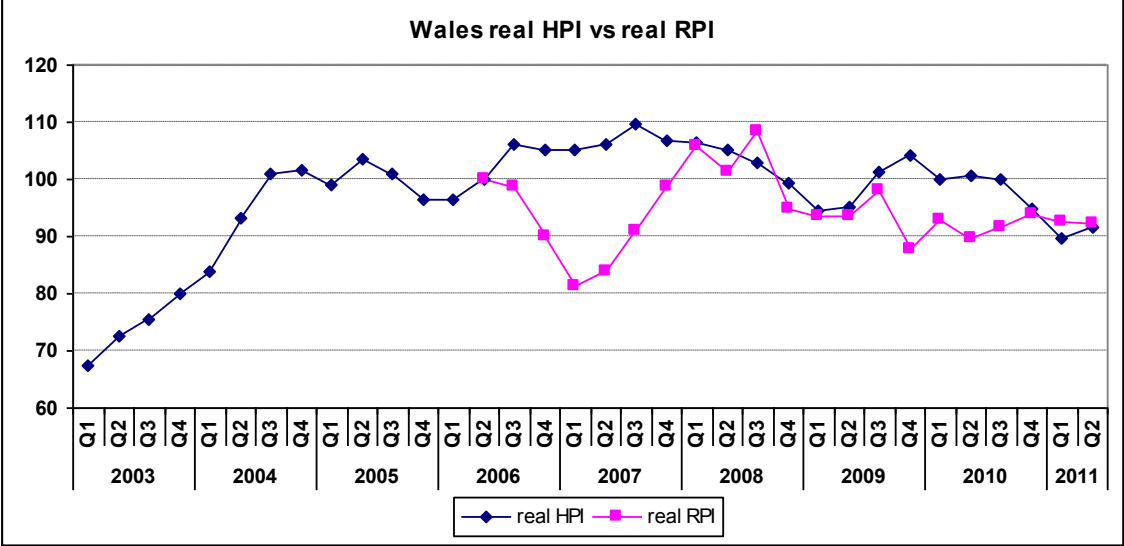
Source: selected from [29]

Graph 6: England real House Price Index and real Rent Price Index



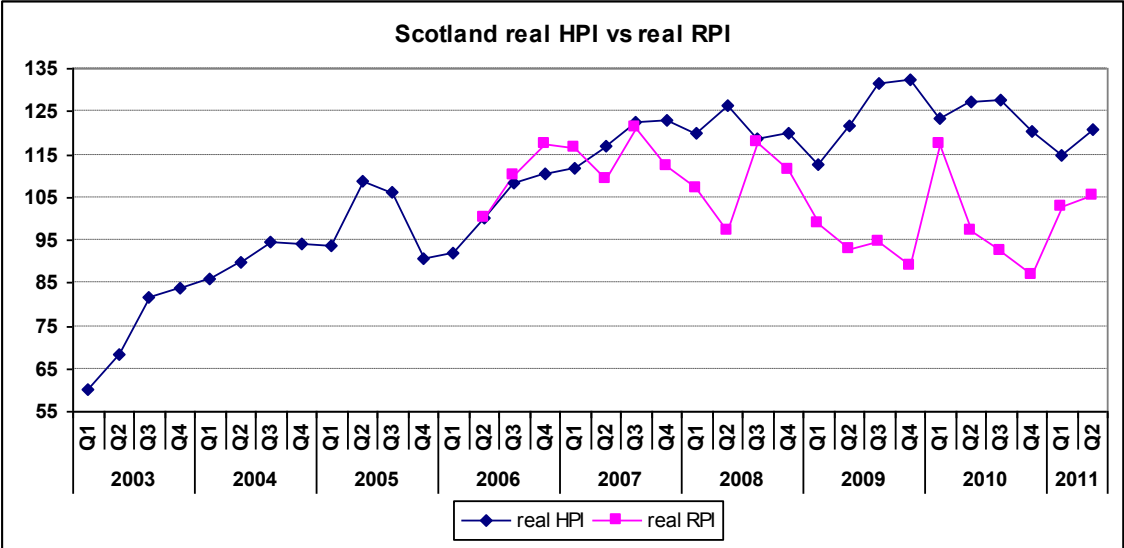
Source: own computation, data from [27] [31] [36]

Graph 7: Wales real House Price Index and real Rent Price Index



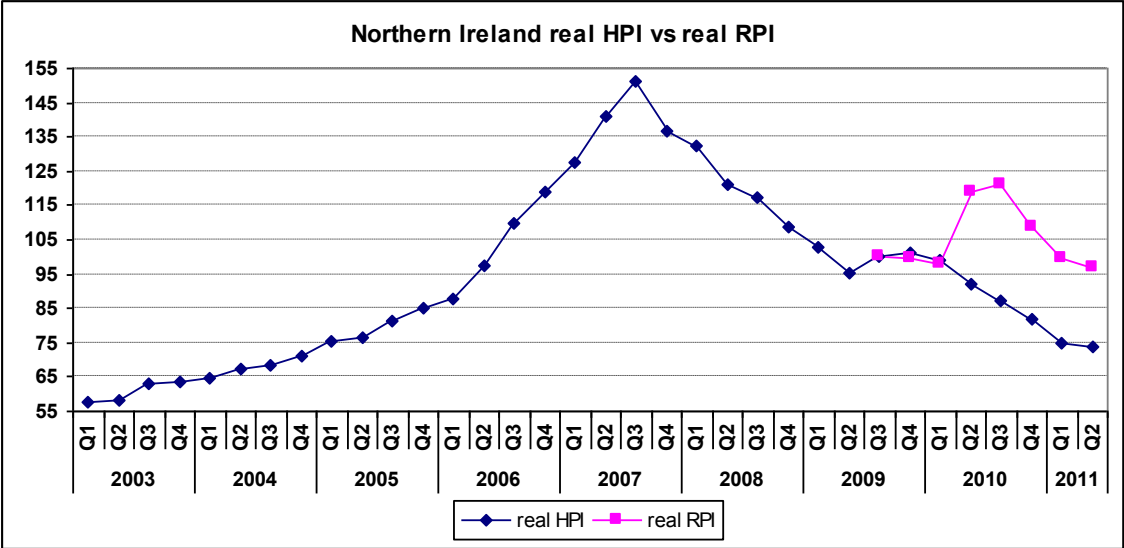
Source: own computation, data from [27] [31] [36]

Graph 8: Scotland real House Price Index and real Rent Price Index



Source: own computation, data from [27] [31] [36]

Graph 9: Northern Ireland real House Price Index and real Rent Price Index



Source: own computation, data from [27] [31] [36]

Table 10: Real median house price index

		UK	England	Wales	Scotland	Northern Ireland
2003	Q1	71.89	75.38	67.29	59.96	57.57
	Q2	76.87	79.88	72.45	68.22	58.30
	Q3	85.05	88.95	75.58	81.53	63.32
	Q4	87.76	89.71	79.99	83.97	63.69
2004	Q1	89.15	91.20	83.95	85.97	64.48
	Q2	93.48	95.43	93.32	90.01	67.19
	Q3	98.50	99.94	100.83	94.71	68.24
	Q4	97.21	99.27	101.73	94.07	71.35
2005	Q1	96.98	99.07	99.16	93.88	75.48
	Q2	99.11	99.86	103.62	108.74	76.75
	Q3	100.53	100.97	100.81	106.39	81.39
	Q4	96.72	97.20	96.52	90.73	85.23
2006	Q1	98.19	97.17	96.49	92.08	88.00
	Q2	100.00	100.00	100.00	100.00	97.70
	Q3	105.37	104.55	106.00	108.38	109.61
	Q4	104.63	103.24	105.25	110.51	119.03
2007	Q1	104.46	103.07	105.08	111.92	127.33
	Q2	105.76	104.29	106.24	117.03	141.16
	Q3	109.44	108.36	109.72	122.46	151.43
	Q4	107.75	106.74	106.77	122.88	136.58
2008	Q1	106.11	105.15	106.30	119.81	132.66
	Q2	105.17	104.18	105.29	126.46	120.95
	Q3	104.42	102.88	102.91	118.53	117.51
	Q4	98.66	97.88	99.24	120.08	109.03
2009	Q1	96.22	94.99	94.65	112.49	103.03
	Q2	97.38	93.96	95.00	121.73	95.51
	Q3	103.47	102.68	101.43	131.60	100.00
	Q4	102.15	100.64	104.15	132.52	101.14
2010	Q1	109.62	110.42	99.93	123.32	98.82
	Q2	107.67	106.93	100.69	127.42	92.34
	Q3	109.01	108.98	100.09	127.90	87.18
	Q4	102.84	102.50	94.72	120.28	82.05
2011	Q1	97.58	97.66	89.54	114.73	75.01
	Q2	97.82	97.33	91.59	120.97	73.99

Source: own computation, data from [27] [31]

Table 11: Real mean rent price index

		UK	England	Scotland	Wales	NI
	Q2	100.00	100.00	100.00	100.00	
	Q3	92.42	95.14	110.20	98.64	
	Q4	82.94	82.57	117.16	89.95	
2007	Q1	89.60	83.00	116.49	81.23	
	Q2	92.89	93.62	109.35	83.95	
	Q3	96.61	99.46	121.12	90.86	
	Q4	88.96	84.48	112.03	98.70	
2008	Q1	83.83	91.67	107.23	105.78	
	Q2	80.68	84.65	97.26	101.27	
	Q3	76.38	79.02	118.01	108.50	
	Q4	78.81	85.14	111.35	94.79	
2009	Q1	84.11	88.42	98.76	93.61	
	Q2	73.74	75.54	92.85	93.56	
	Q3	75.14	73.72	94.39	98.14	100.00
	Q4	82.17	74.65	89.16	87.74	99.61
2010	Q1	90.23	87.46	117.51	93.02	97.83
	Q2	102.48	103.62	97.17	89.65	118.94
	Q3	105.21	105.10	92.54	91.48	121.36
	Q4	105.15	107.53	86.66	93.72	108.63
2011	Q1	116.05	110.60	102.55	92.48	99.83
	Q2	116.09	113.46	105.20	92.40	96.83

Source: own computation, data from [31] [36]