

Is the House Price Movement Explaining the Pattern of Consumption: The Case of U.K.?

Dr. Zeineb NAGGARA

University of Nice Sophia-Antipolis, CEMAFI, France

Email: Nagara_zeineb@yahoo.fr

Dr. Makram BELLALAH

Amiens University, CRIISEA, France

Email: Makram.bellalah@u-picardie.fr

Abstract

The purpose of this paper was to investigate whether the historical perspective of house price movements could help to explain the recent pattern of consumption in the UK. In addition to this, tests of this study evaluated how strong the correlation between those variables within a specific period of time could be. This paper also attempted to investigate to which extent the current crisis, *well-known* as the subprime market crash, could affect future expectations about house prices and consumer habits, considering the following three housing market hypotheses: 1) a wealth effect (Muellbauer & Murphy, 1990): *an expected increase in house prices raises the desired level of expenditure*; 2) *the lower credit constraints, the higher consumption* (King & Pagano, 1990); and 3) *common causality model*: factors such as changes in expected income growth, tax changes or changes in credit market conditions lead to increases in both household expenditure and house prices. Our findings about the coincidence of house prices and consumption during the last two decades had corroborated the hypothesis that an increase in house prices movements could help to explain the followed pattern of consumption.

Keywords: House Prices, Consumption, Wealth Effect, Housing Market.

1. Introduction

The global financial downturn in 2007 has remarkably affected the historical perspective of house price movements in the UK. Since then, this financial turmoil which had its origins in a previous credit crisis called the *sub-prime mortgage market crash*, can be considered to be the first domino in a whole chain. This type of lending practice, which presumably has changed the relationship between house prices and consumption, has not only clearly marked a historic turning point in the UK economy, but it has also set in motion fundamental changes in the credit market in terms of consumer habits, peoples' expectations and government regulations.

It is often believed that this phenomenon, accompanied by strong fluctuation in house prices, has also helped to multiply its devastating snowball effects on the economy, especially for

those household victims of the credit crunch, who saw their consumer spending fall as a cascade after 2006.

Therefore, the subprime market crash, led by financial institutions in the mortgage market such as HBOS, Nationwide, Northern Rock etc, could be the most recent explicative fact that presumably could have changed the connection between house prices and consumption in the UK since the 1980s. However, and based on previous downturns in the UK economy as seen in 1991, it has not yet occurred. Arguably, one may tacitly suggest that the magnitude of this lending practice can only have a major impact on countries where the credit market is weak and not well developed; unlike the UK where financial institutions are more concerned about financial stability and the well-being of the economy through regulation.

Bearing this in mind, the following three housing market hypotheses will be considered: 1) a wealth effect (Muellbauer & Murphy, 1990): *an expected increase in house prices raises the desired level of expenditure*; 2) *the lower credit constrains, the higher consumption* (King & Pagano, 1990); and 3) *common causality model*: factors such as changes in expected income growth, tax changes or changes in credit market conditions lead to increases in both household expenditure and house prices (King & Pagano, 1990; Aoki et al., 2001). In addition, a historical perspective of two decades will also be used to investigate how some observable facts from the past have led and influenced the relationship between house prices and consumption, and also how some endogenous variables have accentuated the crisis effects to a larger extent. Finally, the analysis will run a test on the response of household consumption to house prices; considering both housing as a major component of wealth and credit access as a source of liquidity.

Section. 1 Literature Review

According to the literature there are three main key housing market hypotheses that could explain the link between house prices and consumer spending: 1) a wealth effect (Muellbauer & Murphy, 1990). i. e. an expected increase in house prices raises the desired level of expenditure; 2) the lower credit constrains the higher consumption (King & Pagano, 1990) common causality model: factors such as changes in expected income growth, tax changes or changes in credit market conditions, could lead to increases in both household expenditure and house prices (King & Pagano, 1990; Aoki et al., 2001).

Recent studies show that consumer expenditure is not only the dominant component of aggregate demand, but is also the key factor for understanding the behaviour of the housing market. In recent years there has been increasing interest in the role of housing and its interaction with consumption. Benito & Haroon (2006) point out that "*houses are a significant part of household wealth*" and this higher wealth is typically associated with higher consumption, at least among those who own houses.

In the same way, Nickell (2004) remarks the importance that houses bring to the market by quoting "*an increase in house price arguably makes non-home owners worse off via higher rents*

or the higher savings required for future house purchases". Hence the consumption of this group may decrease and the overall wealth effect may be insignificant as a result of being non-home owners. Secondly, households may borrow vastly more cheaply if they own housing equity which may be used as collateral. Then an increase in house price raises housing equity and cheaper borrowing typically results in increased consumption. Thirdly, both house prices and household consumption tend to be positively related to household expectations of future earnings.

Additionally, Benito and Haroon (2006) and Nickell (2004) assert another view that there is an important causal effect of housing in providing collateral which allows credit to be obtained on more favourable terms to finance consumption. That role may be particularly strong, or only exist at all, for those who might well be less constrained by the availability of easy access to credit as a source of liquidity.

For example: Data in the US estimates that the marginal propensity to consume out of wealth range vary from 4 to 7 cents, depending on the amount at which aggregate wealth can positively change (Gale & Sabelhaus, 1999; Davis & Palumbo, (2001). Similarly, American economists have long known that there is a strong affiliation between wealth and spending in the economy. The evidence suggests that people could increase their spending by about \$5 for each \$100 increase in their net wealth and visa-verse (Bartlett, 2009).

Subsequently, in the work of Aoki, Proudman and Gertjan (2003) it is assumed that if house prices are growing rapidly, consumption growth will be affected in the same way. Not far from that, recent minutes of the Monetary Policy Committee meetings in the United Kingdom stated: *"The continuing strength in house prices would tend to underpin consumption."* (Ibid, 2001). Correspondingly, the Fed Chairman, Alan Greenspan, stated: *"And thus far this year, consumer spending has indeed risen further, presumably assisted in part by a continued rapid growth in the market value of homes"* (Greenspan, 2001).

Aoki's research stresses the importance that housing market brings to the owners for access to the borrowing sector as collateral. He suggests that the value of housing in the UK accounts for almost 40% of total households, i.e. approximately 80% of all household borrowing can be secured with their homes. As a result of that, owners are more able to get easier access to credit by financial institutions and make use of it in order to augment their Marginal Propensity of consumption.

As one can expect, the authors do not deny the possible effects between house prices and fundamentals; not surprisingly they support the idea that house prices and consumption move together and synchronously. One of the reasons that might explain these movements is that consumers are optimistic enough about the economic prospect, and secondly, because house prices in the UK are included within the retail price index which determines both the level of house prices and wealth.

Coincidentally, the model proposed by Orazio, Andrew and Matthew (2008: pp 2) provides

more evidence about the strong correlation between house prices and consumer spending. Their findings show that over the past thirty-five years the correlation between those variables has been relatively stronger than other countries, even during boom and bust periods.

Section. 2 A Brief Description of the UK Housing Market

Historically, the UK's housing market has evidenced a long history of booms and slumps. Since the 1980s the performance of the UK housing market was clearly marked by a period of economic transformation, where the changes in credit availability during that period could likely have contributed to enlarge the boom and subsequent retrenchment in consumption. The evidence shows that in the late 1980s the UK experienced an inflationary boom which led house prices to increase dramatically at an increasing rate of 30% and general inflation rising to over 10%.

According to Samter (2007) the British government in the 1980s cracked down on inflation and unemployment in order to control the negative effects caused by the turmoil in the economy after the liberalization process. Despite the failure in the policy action taken during that time to reduce inflation, the British economy started experiencing an economic downturn, which then became intertwined with falling house prices by up to 13% between 1990 and 1993. Analysts of that time affirm that as a consequence, many lost their homes or faced negative equity because those who owned houses were unable to resell their properties as the high cost of outstanding debt on their mortgage exceeded the present value of their home. After that they stabilised for approximately 18 months before falling by a further 4% between mid 1994 and the end of 1995.

Following that, the development of the credit markets allowed the British economy to live continuous periods of economic growth and positive house prices movements as a result of the boom. Since 1996 nominal house prices have risen by approximately 180% and by approximately 150% after accounting for general inflation, whereas economy growth reached levels of 5% since 1992.

In part, one may propose that the timing and characteristics of those particular booms and slumps from the past not only reflect changes in macroeconomic fluctuations, GDP, unemployment, interest rates, or shifts in credit conditions, but can also reflect some changes in people's expectations as seen in 1991 with the decline in consumption. Undoubtedly, such fluctuations are not straightforward to control, because the developing of the mortgage markets, new lending practices and the amount of housing supply, can increase the chances to boost more and more spending. Furthermore, it can also limit the responsiveness towards the market for readjusting opportune changes in demand and supply.

Finally and most recently the UK landscape has noticeably shown signs of change as a result of the longest on record economic downturn and the overvaluation of house prices at the end of 2007. By comparing previous booms with the recent downturn, one may tacitly identify that the behaviour in house prices has been commonly followed by a response in consumption since

1989. Primarily there is a sharp increase in house price, which is followed by a period of decreasing house prices along with consumption, GDP, consumer confidence and consumption - see graphs. Secondly, there is a short stage in which house prices are adjusted within a period of two to three years, where those significant negative changes are diminished by the government's intervention, price controls and financial assistance.

Finally, and more importantly, there is a strong tendency to reduce interest rates along with inflation and a major alarm in the unemployment rate. According to the Halifax House Price Index (2008), it is believed that the current house price boom is the longest on record, with prices increasing by more than 5% a year from 1997 to 2007 in overall.

Section. 3 Methodology

3.1 Data and Econometric Models

Our data were mainly being collected from the Office of National Statistics and treasury HM. The analysed period for the study is from 1989-2008.

Our empirical tests are based on a linear and multiple regressions. Generally, the following model maintains the basics of previous studies as has been noted in Benito et al. (2006). However, this one differentiates from others, because this model not only includes and focuses on recent facts post-2007 financial crisis, but it also takes into account several key indicators for the current financial crisis, such as: consumer confidence, unemployment rates and net mortgage lending rates.

First we use a linear regression between consumption and house prices, in which the database corresponds with a period of economic crises characterized by high volatility and financial instability, from 1998 to 2008.

$$\text{SPEND} = C(1)*\text{HP} + C(2) \quad (1)$$

Second a multiple regression between consumption and house price, GDP, consumer confidence, net lending mortgage, household disposal income and unemployment, considering the same assumptions from the previous regression in terms of time. This, in due course, will bring more consistency among the theory and reality based on previous event.

$$\text{SPEND} = C(1)*\text{HP} + C(2)*\text{CONFCONS} + C(3)*\text{GDP} + C(4)*\text{NETLENDING} + C(5)*\text{RHDI} + C(6)*\text{UNEMP} + C(7) \quad (2)$$

Where,

SPEND = Final consumption expenditure annual % growth

HP= House prices annual % growth

GDP = Grow Domestic Product annual % growth

CONCONFS =Consumer confidence index balance annual

NETLENDING = Net mortgage lending growth

RHDI= Real household Disposable Income annual % growth

UNEMP= Claimant unemployment rate annual % growth

C= Constant

In essence, the model will be developed from the basis of the IS-LM model where the consumption variable is determined by changes in the current income, personal wealth and expectations (Piana, 2002).

3.2. The choice of explanatory variables

The model considers the following six variables to reveal the relationship behind the housing market and consumer spending during the period comprehended between 1989 and 2008. Our dependent variable is given by:

SPEND=Household final consumption expenditure (Consumer Prices Index).

We use as independent variables:

HP= House prices. It has often been said that increase in house prices leads to boost consumption. In general this variable is considered as a major source of personal wealth in the UK. According to Muellbauer (2007) the more gross housing wealth, the greater the available collateral for mortgage debt and thus the greater the consumption. Recently this variable has been recovering its significance and magnitude as an economical indicator since the last boom of house prices in 2007, and therefore this variable will be the main independent variable for the model.

GDP: Gross Domestic Product: This important variable, which has historically been used as economic indicator, has made it known that there is a strong association between house prices, GDP and consumption. A recent IMF (2003) in Farlow, (2005) on a cross-country study in the UK on housing booms and busts, calculated that roughly 40 per cent of all housing booms are followed by large changes in consumption associated with very high GDP declines.

CONFCONS: Consumer Confidence GFK: According to Garratt (2000) the consumer confidence indicator can explain up to two-thirds of the variation in the annual growth of house prices. Equally, it does have an important role for influencing the willingness of households to undertake secured borrowing.

RHDI= Real Household Disposable Income: According to the Office for National Statistics (ONS) (2009) this indicator is used to compare living standards and development in the UK.

NETLENDING= Net Mortgage Lending: This variable constitutes great theoretical explanation for the research because it can help to explain previous booms and busts in the UK. For example: the historical perspective shows that the following crises after the 1980's boom have

been characterised by high interest rates periods; low household income and low GDP growth. This, added to sudden movement's in house prices, could have had negative effects on the consumption demand in the UK.

UNEMP= Claimant Unemployment Rate: This rate is considered to be one of the most principal unemployment indicators in Great Britain. To some extent it determines the propensity to consume as a result of the discrepancy between incomes and saving rates. In other words, this macroeconomic indicator has an inversely proportional effect on the consumption function by diminishing the level of personal wealth.

3.3 Time Series

The time period chosen for the analysis is based on annual series from January 1989 to April 2008. This period includes critical facts associated to house prices and consumption in which the UK economy has been particularly sensitive. Those several historical incidents can significantly help to test the response and accuracy of the model. Moreover, some other critical periods will be contained and summarised in the time series analysis.

Figure 1. Historical Perspective of Global Events



Source: (UK Recession analysis 2008)

Besides, the study also uses in first step the **Pair wise Granger Causality test** that indicates if the past of each variable affects the present of the other variables, in this case, for example: compare the *GDP historical perspective with the present consumer confidence*. The theory suggests that causality does not exist when the past of each one of those variables does not affect the present endogenous or exogenous variables. And second the **Chow test** that allows finding out if there is any structural break point in the dataset by changes in policies or shocks in the economy on time series. This test can lead to huge forecasting errors and unreliability if those breaking points are not detected in the model.

Section 4- Data Analyses and Findings

4.1 Linear Regression

$$SPEND = 0.1294815893 * HP + 1.734138565$$

Table 1. Results of regression analysis

Variable					
HP		Coefficient			
C			Std. Error	t-Statistic	Prob.
R-squared		0.129482	0.026371	4.910000	0.0001
Adjusted R-squared		1.734139	0.288492	6.011047	0.0000
S.E. of regression					
Sum squared resid		0.572529	Mean dependent var		2.568000
Log likelihood		0.548780	S.D. dependent var		1.552613
Durbin-Watson stat		1.042935	Akaike info criterion		3.016594
		19.57883	Schwarz criterion		3.116167
			F-statistic		24.10810
			Prob(F-statistic)		0.000113

According to the test based on our linear regression, the following conclusions were obtained:

- By taking just the house prices variable, 57.25% of the variations in the *SPEND* are a consequence of the independent variable in the model.
- Since 1989 there has been a strong relationship between house price and consumption as a result of the credit market liberalization and the psychological wealth effect from house prices movements.

- According with the model, changes in house prices by 2 units produces increases in consumer spending by 0.2589 units.
- The analysis suggests that when house prices go up, there is a strong consumer response adjusted by the housing market expectations.

4.2 Multiple Regressions

$$\text{SPEND} = 0.05692718216 \cdot \text{HP} + 0.0670272835 \cdot \text{CONFCONS} + 0.3258144702 \cdot \text{GDP} + 1.22270418 \cdot \text{NETLENDING} + 0.2582495352 \cdot \text{RHDI} - 1.640080882 \cdot \text{UNEMP} + 1.121331821.$$

This regression shows that:

- 95.16% of the variations in *Consumer spending* are a consequence of the independent variables in the model: House prices, GDP, Household Income, consumer confidence, net lending and Unemployment.
- According to the main equation (2), changes in HP house prices by 1 unit produces increases in consumption by 0.056 units, and it also increases in consumer confidence. GDP, household disposable income and net lending have the same effect but in a lower proportion. This is unlike the unemployment rate, which if increases by 1 point, decreases consumption by 1.64 points.
- The sensitivity at which consumer spending is exposed by changes in other variables is highly representative. Between 1980 and 2004 the chow test did not show structural changes in house prices and consumption. However, the period comprehended between 1991 and 1992 considerably affected the scale at which consumption is measured as a result of the crisis (but by default the chow test includes this period as one of no structural change). The following period after 2004 when house prices started increasing did also not show signs of stability problems as the chow test suggested.
- According to the causality test, the past of the variable Net Mortgage Lending or (*NETLENDING*) affected the present of the variable *HP* (House Prices). This observable fact can be attributable to past lending practises in 2004, which considerably affected present house prices. When the subprime market started growing, as a result of a large number of mortgages approved, house prices began to increase dramatically along with the risk and the psychological wealth effect from lending. This, linked to the capacity to spend, brought higher expectations about house prices and interest rates.

These findings, along with the proximity at which other variables were tested to the consumption variable, highlight the importance of considering house prices as a barometer for

both the economy and the market.

Table. 2. Results of multiple regression analysis

Variable	Coefficient		t-Statistic	Prob.
		Std. Error		
HP	0.056927	0.013862	4.106836	0.0012
CONFCONS	0.067027	0.027311	2.454181	0.0290
GDP	0.325814	0.144169	2.259945	0.0416
NETLENDING	1.222704	0.484097	2.525740	0.0253
RHDI	0.258250	0.098515	2.621411	0.0211
UNEMP	-1.640081	0.822839	-1.993198	0.0677
C	1.121332	0.593184	1.890362	0.0812
R-squared	0.951625	Mean dependent var		2.568000
Adjusted R-squared	0.929297	S.D. dependent var		1.552613
S.E. of regression	0.412839	Akaike info criterion		1.337699
Sum squared resid	2.215669	Schwarz criterion		1.686206
Log likelihood	6.376994	F-statistic		42.62189
Durbin-Watson stat	2.134600	Prob(F-statistic)		0.000000

The variable with more significance in the model is *HP* (4.106836) followed by *RHDI* (2.621411), *NETLENDING* (2.525740), *CONFCONS* (2.454181), *GDP* (2.259945), and in the last instance by *UNEMP* (-1.993198); which means that House Prices and Household Disposable Income are highly representative in the UK for considerably affecting the variable of consumption.

4.3 Pairwise Granger Causality Tests

The results are shown in the Table A in Appendix section shows that *the Net Mortgage Lending growth "NETLENDING"* causes the variable House Prices "*HP*", or, the past of the variable *NETLENDING* (Net Mortgage Lending) affects the present of the variable *HP* (House prices). On the other hand, the past of the other remaining independent variables *HP*, *GDP CONSCONF*, *RHDI* and *UNEMP*, do not affect the present of the dependent variable *SPEND* (consumption).

4.4 Chow Breakpoint Test

Table 3. Chow Breakpoint Test: 2001

F-statistic	1.213429	Probability	0.414761
Log likelihood ratio	17.63951	Probability	0.013707

Table 4. Chow Forecast Test: Forecast from 2002 to 2008

F-statistic	0.929149	Probability	0.543993
Log likelihood ratio	14.68585	Probability	0.040244

According to the Chow test, there are no significant signs of structural changes in the model. Moreover, the probability associated to the statistic was lower than 5% indicating no structural changes in the sample.

Section. 5 Conclusion

The present study has been an analysis of the housing market and its influence on consumption in the UK. Its findings about the coincidence of house prices and consumption during the last two decades have corroborated the hypothesis that an increase in house prices movements can help to explain the followed pattern of consumption. According to the outcomes from the main equation (2), changes in house prices by 1 unit produce increases in consumption by 0.056 units, due to the fact that in the UK approximately 75% of the population owns a house. These results of housing wealth effects were also compared with other previous studies developed by Belskey & Prakken (2004) and Case Quigley & Shiller (2001) where those results showed also similar responses in consumption.

Moreover, increases in consumer confidence, GDP, household disposable income and net

lending have the same effect on consumer spending but in a lower proportion; unlike the unemployment rate, which if increases by 1 point, decreases consumption by 1.64 points.

The theories along with the model have not contrarily found that the effects of any potential decline in house prices could negatively affect UK stability by decreasing the marginal propensity to consume, which intrinsically comes with the housing wealth effect. It is believed that when house prices fall, people are more concerned about their psychological wealth. Therefore, they tend to be more reluctant to spend, because their equity turns negative as result of those lower expectations and less availability of credit confirming the assumption about credit constraints.

Moreover, the phenomenon of lowering consumption through house prices' effects can also be explained by the recent subprime market crash which originally could have affected housing wealth and consumption since 2005 in the UK. According to the subprime market review, large amounts of mortgage products provided by banks during 2005 and 2006, unquestionably initiated a wave of consumption, but it also brought panic and then recession as a result of the unsustainable bubble of house prices and wealth.

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Appendix:

Table A: Pair wise Granger Causality Test

Sample: 1989 2008

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
HP does not Granger Cause SPEND	19	0.34273	0.56642
SPEND does not Granger Cause HP		2.51299	0.13248
GDP does not Granger Cause SPEND	19	0.88166	0.36171
SPEND does not Granger Cause GDP		0.12010	0.73344
CONFCONS does not Granger Cause SPEND	19	1.18841	0.29180
SPEND does not Granger Cause CONFCONS		1.01681	0.32828
RHDI does not Granger Cause SPEND	19	0.17087	0.68483
SPEND does not Granger Cause RHDI		0.62565	0.44052
NETLENDING does not Granger Cause SPEND	19	1.15299	0.29885
SPEND does not Granger Cause NETLENDING		4.56593	0.04840
UNEMP does not Granger Cause SPEND	19	3.12385	0.09622
SPEND does not Granger Cause UNEMP		2.39780	0.14106
GDP does not Granger Cause HP	19	1.24368	0.28123
HP does not Granger Cause GDP		0.19933	0.66125
CONFCONS does not Granger Cause HP	19	3.00970	0.10199
HP does not Granger Cause CONFCONS		0.40800	0.53202

RHDI does not Granger Cause HP	19	0.11657	0.73722
HP does not Granger Cause RHDI		0.01375	0.90811
NETLENDING does not Granger Cause HP	19	9.85233	0.00634
HP does not Granger Cause NETLENDING		0.65166	0.43136
UNEMP does not Granger Cause HP	19	0.03463	0.85472
HP does not Granger Cause UNEMP		0.37788	0.54738
CONFCONS does not Granger Cause GDP	19	0.42067	0.52580
GDP does not Granger Cause CONFCONS		1.52761	0.23431
RHDI does not Granger Cause GDP	19	2.53554	0.13087
GDP does not Granger Cause RHDI		0.16406	0.69081
NETLENDING does not Granger Cause GDP	19	1.23660	0.28256
GDP does not Granger Cause NETLENDING		3.47073	0.08093
UNEMP does not Granger Cause GDP	19	2.94382	0.10550
GDP does not Granger Cause UNEMP		6.58514	0.02072
RHDI does not Granger Cause CONFCONS	19	0.34530	0.56499
CONFCONS does not Granger Cause RHDI		0.51393	0.48378
NETLENDING does not Granger Cause CONFCONS	19	0.01909	0.89183
CONFCONS does not Granger Cause NETLENDING		2.90458	0.10767
UNEMP does not Granger Cause CONFCONS	19	7.95910	0.01229
CONFCONS does not Granger Cause UNEMP		3.47776	0.08065
NETLENDING does not Granger Cause RHDI	19	0.85506	0.36886
RHDI does not Granger Cause NETLENDING		1.02311	0.32684

NETLENDING

UNEMP does not Granger Cause RHDI	19	0.31770	0.58081
RHDI does not Granger Cause UNEMP		0.08638	0.77261
UNEMPdoesnotGrangerCause			
NETLENDING	19	1.04285	0.32235
NETLENDING does not Granger Cause UNEMP		0.13594	0.71719