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CONSUMPTION AND HOUSE PRICES IN IRELAND

V. Hogan, P. O'Sullivan

Abstract

We examine the link between private consumption and housing wealth in Ireland. We find that until very recently the marginal propensity to consume out of housing wealth was essentially zero. This is in marked contrast to the recent evidence for other OECD countries. The evidence is robust to changes in statistical methodology. Thus we can conclude that the recent consumption growth was not financed by borrowing against housing wealth. This suggests that any decline in house prices would not cut consumption significantly.

1. Introduction

The well-documented rise in Irish house prices in recent years has led to some public disquiet on two related questions: the sustainability of the property market itself; and the effect of any collapse on the economy in general. Some commentators worry that the property boom represents an unsustainable bubble market, which will inevitably burst with possibly dire consequences for the economy as a whole. Parallels are often drawn with the collapse of the UK property market in the late 1980s and the early 1990s and the resulting negative equity problem.[1]

In fact these two questions are closely related to the overall question of how housing wealth affects private consumption and savings decisions. For years economists have recognised that rational individuals should change the level of their consumption only in response to permanent changes in their wealth. Temporary

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[1] See "House of Cards", a survey of European property markets in the *Economist*, May 29th, 2003. Roche (2003) criticises the *Economist's* methodology. He suggests that the Irish housing market was then overvalued by no more than 5 per cent.

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changes in wealth should have little or no effect on consumption decisions.[2]

It would, therefore, be reasonable to expect an increase in private consumption in recent years from the growth in housing wealth in Ireland. Of course, it may be the case that individuals are cautious about borrowing against housing wealth because of the psychological importance of home ownership, the desire to make housing bequests and the general illiquidity of housing wealth etc. Thus we might expect that the marginal propensity to consume out of housing wealth to be less then the marginal propensity to consume out of financial wealth – but we would not expect it to be zero. This is confirmed by most of the international evidence (see below).

We might think, therefore, that the Irish experience mirrors the international experience: large scale increases in consumption caused by increases in housing wealth. The fact that a boom in house prices and a consumer boom have been coincident does not allow us to infer causation. In the Irish case at least, there is a plausible alternative explanation for both: the large increase in national income since the early 1990s could in principle be responsible for both the boom in house prices and the boom in consumption.

In what follows, we show that until very recently, the dramatic rise in personal income has explained all of the increase in consumption and the marginal propensity to consume out of housing wealth is essentially zero. This implies that either the population do not believe that the increase in house prices over the last decade are credible or that they are using the accumulated wealth for purposes other than consumption. However, this result also suggests that the consequences of a large correction in house prices may not be as dire as some have feared. If people have not borrowed against housing wealth to boost consumption then a decline in the housing market would have a limited effect on aggregate consumption, limiting the recessionary effects of a large fall in house prices.

The idea of inferring the sustainability of a boom in asset prices from its effect on private consumption is not new. It has been observed, for example, that the boom in stock prices in the US seemed to have little effect on private consumption, suggesting that most private individuals viewed the changes in their wealth as temporary. Furthermore, when the stock market bubble burst in Summer 2000, there was little recessionary effect on private

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[2] For an overview of consumption theory see Deaton (1992) or Attanasio (1999).

consumption – even allowing for the accommodating monetary policy adopted by world central banks.[3]

The paper proceeds as follows. In Section 2, we review the international evidence on the link between housing market and private consumption and savings. In Section 3, we review the recent experience of the Irish economy in general and of the housing market in particular. In Section 4, we present a formal econometric model of the link between Irish consumption and the housing market. We show that our estimate – of essentially zero effect – is robust to various methodological and data issues. Finally, Section 5 concludes.

2. Review of Theory and Evidence

There are two broad strands to the literature that are relevant to our discussion. The first uses aggregate data on house prices and consumption to measure the effect of housing wealth on consumption. The second strand to the literature uses data on micro survey data to look at the effect of housing wealth on individuals' consumption.

Using aggregate US data, Elliot (1980) found no effect upon consumption from changes in non-financial wealth. These results were challenged by Peek (1983) and by Bhatia (1987) who raised questions over the methodology used to estimate real non-financial wealth. But in general, for the United States, time series estimates of the marginal propensity to consume (MPC) out of housing wealth were around 0.04. In other words, for every $1 billion increase in housing wealth, personal consumption increased by $40 million.

Muellbauer and Murphy (1997) argue that the increase in housing wealth was a significant explanatory variable in the context of the UK consumer led economic boom in the late 1980s. They estimated the elasticity of consumption with regard to housing wealth to be 0.045. So a 10 per cent increase in housing wealth would lead to 0.45 per cent increase in consumption.

Kenny (1998) and Miles (1992, 1994) both argue that there are good reasons to remain sceptical of evidence that increases in housing wealth will have an unambiguously positive effect on consumption. This is especially so if a house price boom occurs at the same time as a consumption boom as both phenomena could be explained by other variables such as rising real incomes, expectations thereof or looser credit constraints.

Furthermore, as Miles (1994) argues, an increase in prices may boost the consumption of those who intend to trade down at some

[3] See lecture delivered by Professor Jaime Ventura, Department of Economics, MIT at a conference held by Bank of Ireland Private Banking, Dublin Castle, June 7, 2001.

time in the future, but those who intend to trade up and first time entrants are hurt by price increases and may be forced to cut back on consumption. Therefore, unless households have the ability to exit the housing market en masse then the aggregate wealth effects on consumption could be negligible.

Engelhardt (1996) examined the link between house price appreciation and the savings behaviour of homeowners during the 1980s using micro data. The analysis used self-reported household asset and debt data for a sample of home-owning households under the age of 65 from the 1984 and 1989 waves of the Panel Study of Income Dynamics (PSID) to construct changes in real household wealth as a measure of household saving behaviour. Cross-time and cross-regional variation in housing market conditions were used to identify behavioural savings effects. The estimated marginal propensity to consume out of real housing capital gains was 0.03 for the median household. More recently, Bostic *et al.* (2005) reported estimates of the MPC generated from the US Consumer Expenditure Survey of 0.03.

Disney *et al.* (2002) performed a similar analysis for the UK. They found a marginal propensity consume out of housing wealth of between 0.01 and 0.03. They also found that the effect of housing wealth was higher in absolute terms when house prices were rising i.e. the effect of housing wealth was asymmetric.

McCarthy and Steindel (2007) provide a review of recent US evidence. They show that there is a considerable variation in estimates of the marginal propensity to consume from housing wealth. Estimates based on aggregate data tend to be around 0.05 whereas estimates based on individual level data tend to be around half as large. Belsky and Prakken (2004) using aggregate data, estimate the MPC to be 0.05. Iacoviello (2004) also uses aggregate data but generates estimates of 0.07.

Kenny (1998) focuses on the linkages between the Irish housing market and the economy and one of his main findings is: *…that the response of consumption depends on the type of shock hitting the housing market. In the case of a purely random increase in house prices (a house price shock), there is some evidence in support of the thesis that this gives rise to a positive deviation in consumption above its equilibrium given the level of income. However, in the case of an income shock, while the model gives rise to a positive response in both consumption and real house prices, there would appear to be no evidence that consumption rises above or overshoots its new equilibrium level.*

This again highlights the issue of causation and warns against the simplistic link between housing wealth and consumption.

Case *et al.* (2001) examine the link between increases in housing wealth, financial wealth and consumer spending using a panel of

aggregate macroeconomic data. They perform two separate analyses one using a panel of 14 countries (including Ireland) observed annually during the past 25 years and the other using a panel of U.S. states observed quarterly during the 1980s and 1990s. They found that housing wealth has a statistically significant impact on aggregate household consumption. Perhaps surprisingly, they found that housing wealth had a larger effect on consumption than financial wealth. Their results suggest that the marginal propensity to consume out of housing wealth is 0.11 on average for western countries. Their results, however, do not account for possible simultaneous equation bias. Furthermore, they hide a potentially large degree of variation across countries.

Girourard and Blondal (2001) also examined the impact of house prices on consumption and residential investment using a panel of G7 (excluding Germany) countries. Their main conclusion is that house prices have a significant effect on consumption through either direct wealth effects or the easing of households' liquidity constraints. All the countries, with the exception of Italy, exhibited a significant and positive housing wealth effect on consumption. They argue that the role of the financial system is critical in the translation of increased housing wealth into increased consumption. The ability to borrow or withdraw equity is the prime mechanism to access housing wealth.

The international evidence does point to a housing wealth effect on consumption but the regressions and results rely on evidence from various G7 countries. Inferences from this international evidence have been drawn in describing the Irish economic performance since the early 1990s. This paper attempts to analyse the importance of the increased housing wealth in terms of the consumption and economic boom in Ireland.

3. A First Look at the Data

Figures 1 and 2 show the trend in nominal and real Irish second hand house prices from 1970-2005 from the Department of the Environment's national average second-hand house price series.[4] Over the period prices in nominal terms rose quite strongly, averaging close to 12 per cent, however these gains were significantly eroded by inflation and in real terms, house prices (deflated by the GDP deflator) rose by only 3.5 per cent on average per annum. In the period 1971-79 (see Table 2) nominal house prices rose by just 16 per cent on average per annum, but again the performance in real terms was significantly lower, rising by a little over 2 per cent on average per annum. In the 10 years from 1980 to 1989 nominal second-hand house prices rose by 6 per cent per annum but actually fell by 1 per cent in real terms. From 1994 to 2003 second-hand house prices rose by 16 per cent per annum in

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[4] Table 1 gives the precise definitions and sources of the data used in the paper.

nominal terms and more significantly by 12 per cent in real terms per annum.
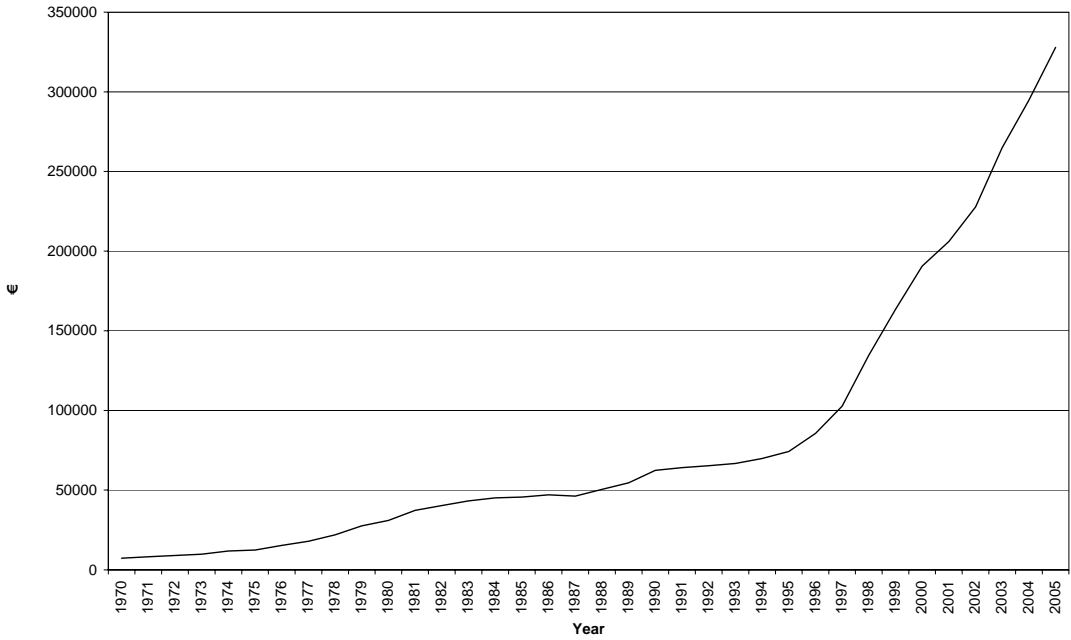
Figure 1: Irish Second-Hand House Prices
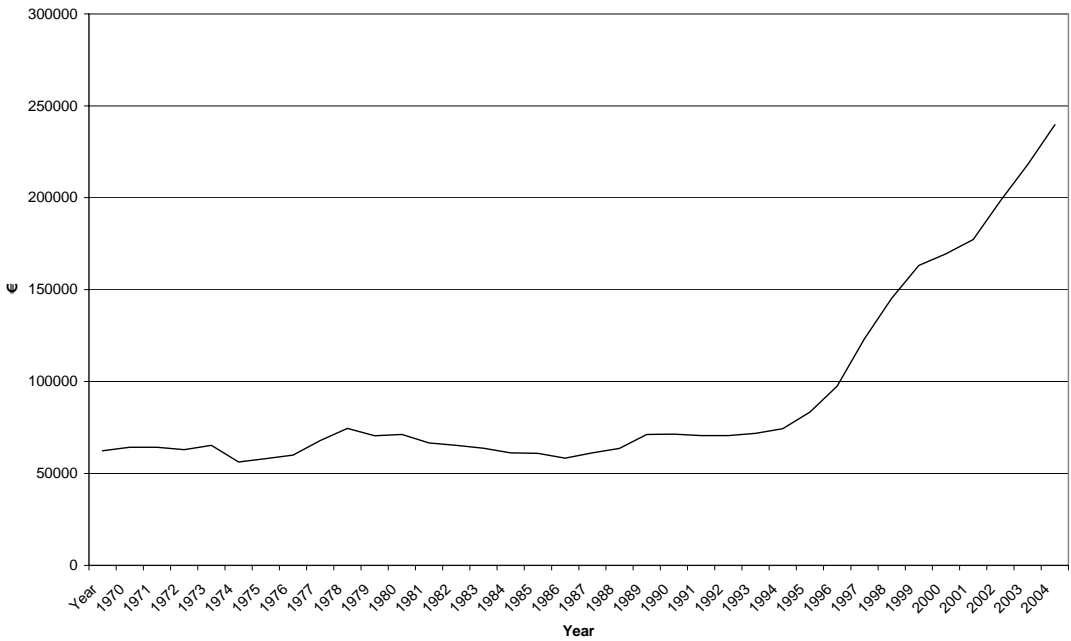

**Figure 2: Irish Real Second-Hand House Prices**

Table 2: Growth Rates

	1970-1979		1980-1989		1994-2003	
	Cumulative Growth %	Growth p.a. %	Cumulative Growth %	Growth p.a. %	Cumulative Growth %	Growth p.a. %
House Prices[1] (nominal)	278	16	76	6	297	16
House Prices (real)	20	2	-10	-1	182	12
Consumption (per capita)	27	3	16	2	56	5
PDI (per capita)	33	3	10	1	58	5
Housing Wealth (per capita)	27	3	2	0	219	14

1.   National price of second-hand houses.
2.   Consumption, Income, house prices and wealth deflated by the consumption deflator (100 in 1995).

As can be seen from Figure 3, this boom in house prices, combined with a boom in house building, lead to a dramatic increase in housing wealth per capita. Between 1994 and 2003, housing wealth per capita more than tripled (see Table 2).

Figure 3: Housing Wealth per Capita
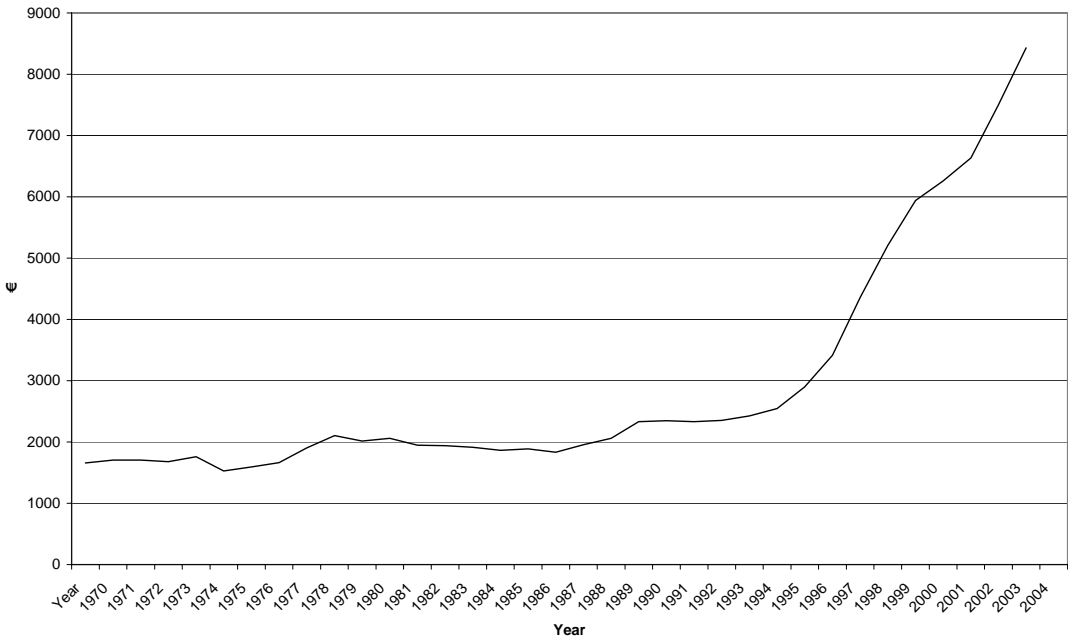
Figures 4 and 5 show that the increase in wealth coincided with a general boom in the Irish economy, with a cumulative rise in real GNP per capita of 70 per cent over the period 1994 to 2003. During this period, real personal consumption rose by 56 per cent.

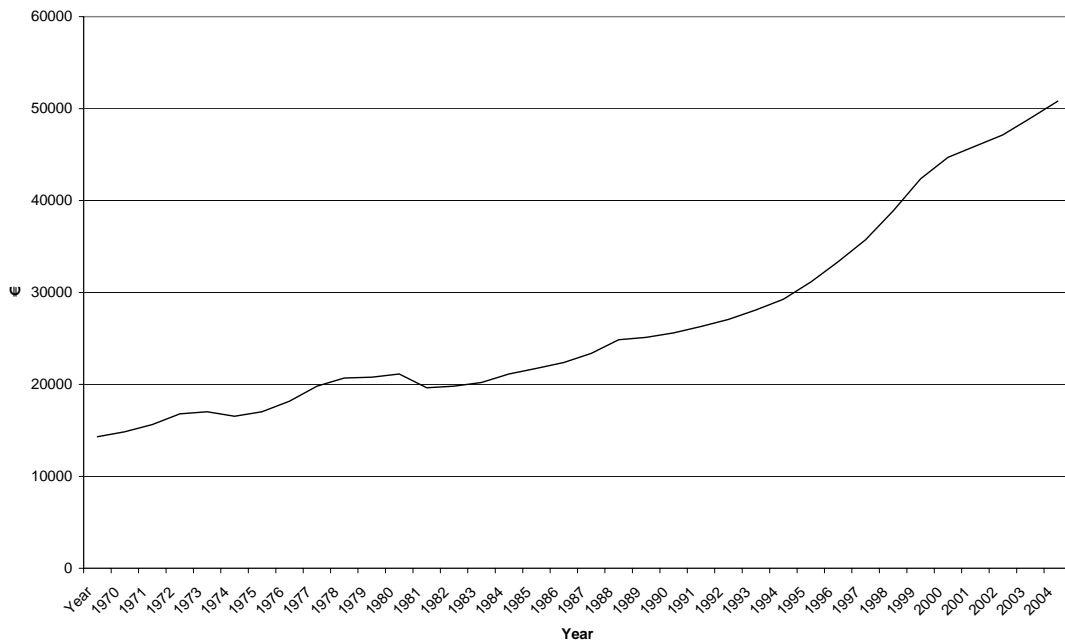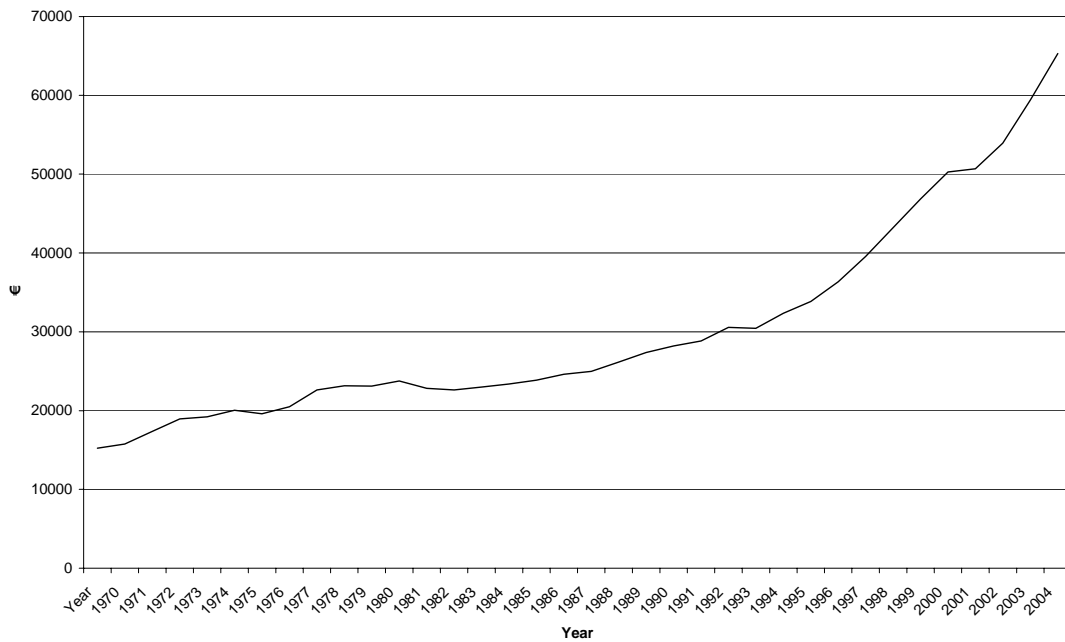**Figure 4: Irish Real Personal Consumption Deflator: Personal Consumption Deflator, 1995=100**

Figure 5: Irish Real Personal Disposable Incomes Deflator: Personal Consumption Deflator, 1995=100

This has raised inevitable questions about the contribution of the increase in housing wealth to the consumer and economic boom. The rise in house prices did not occur in isolation, as real personal disposable income growth was very robust, rising by 58 per cent on a cumulative basis. Thus, an obvious question is whether the rise in house prices played any meaningful role in explaining personal consumption growth or can real income growth unilaterally explain Irish personal consumption?

4. A Simple Econometric Model of Housing and Consumption

The standard framework for examining consumption, income and savings is the permanent income-life cycle hypothesis. The central tenant of the model is that consumption decisions are made in order to maximise utility over time. Furthermore, the level of consumption will only be affected by the permanent component of changes in income or wealth (financial and non-financial). Case *et al.* (2001) argue that consumers will distribute anticipated increases in permanent wealth over their life cycle and the marginal propensity to consume (MPC) out of wealth will be the same for all sources of wealth. There are, however, reasons why the MPC could be different for housing wealth than for other forms of wealth. First, if an accumulation of housing wealth were deemed to be temporary, then a rational agent would refrain from consuming it. Second, housing wealth could be used for investment purposes. Third, a bequest motive may induce individuals to keep property holdings intact until death in preference to financial assets. More generally, there could be an emotional dimension to the ownership of a family home that is not present for other forms of wealth. All of these effects would lead to an MPC from housing wealth that is lower than the MPC for wealth in general.

The basic strategy is to estimate a model similar in structure to Case *et al.* (2001). In essence we run a regression of consumption on disposable income and the value of the housing stock. All variables are in real per capita terms and as defined in Table 1.[5]

[5] We also tried adjusting personal disposable income to explicitly exclude income arising from property. However, the results are the same as using the usual NIE definition and we do not present them here.

Table 1: Data Sources and Construction

Variable	Definition	Construction /ESRI Mnemonic
PC_nom	Nominal Private Consumption	B0501
PC_real	Real Private Consumption	B0601
PDI_nom	Nominal Personal Disposable Income	B0907- B0909
HSTOCK	Housing Stock	HSTOCK3
GNP	Real GNP	B0422
PSECN	Average national price of second-hand houses	PHOLD
P	Consumption Deflator	PC_Nom/PC_real
Int[4]	Long-term interest rates	RGL
GC_nom	Nominal Government Consumption	B0502
POP	Population	NT
POTY	Potential Output	HP Filtered GNP
PDI	Real per capita personal disposable income	(PDI_Nom)/(P*POP)
GC	Real per capita government consumption	GC_nom/(P*POP)
HWEALTH	Real per capita housing wealth	HSTOCK*PSECN/(P*POP)
CONS	Real per capita private consumption	PC_real/POP
Real_i	Real long term interest rate	$Int-(lnP_t-lnP_{t-1})$

1. This data from ESRI Databank but supplemented for 2003 using NIE from CSO, Dublin.
2. This data from ESRI Databank but supplemented for 1970-74 using data from Department of the Environment, Dublin.
3. Second-hand house prices are not available 1970-73 so we use data extrapolated back from the 1974 observation using the growth in the price of new housing.
4. Short-term interest rates are available only since 1975.
5. HSTOCK3 is the estimated stock of permanent dwellings. Using houses completed in year and benchmarked on Census 1991, 1996 and 2002.

Table 3 shows the results. The first column presents the results of a simple OLS regression of consumption on income, interest rates and housing wealth. (Note that the numbers in parenthesis are t-statistics of the significance of the variables.) As can be seen, housing wealth turns out to be statistically insignificant. The p-value generated by a t-test of the null hypothesis that housing wealth has no effect on consumption is 0.34 indicating that the null hypothesis that housing wealth has no impact on consumption cannot be rejected at the usual significance levels.

The results in column 1 show that interest rates have positive and statistically significant effect on consumption. This is implausible and may suggest that the estimates are biased. This could be so because of the presence of stochastic time trends. If all the variables are increasing over time, the OLS may capture this rather than any true causal relationship between them. Figures 1-5 suggest that the main variables are indeed trending up. This is confirmed by formal testing of the three variables for unit roots. We cannot reject the presence of a unit root in any of the three variables

at the usual significance levels.[6] One way to take account of integrated regressors is to include lags of the variables in the regression.[7] This we do in the second column of Table 3.

Table 3: Econometric Results

	(1) OLS 1970-2003	(2) OLS 1971-2003	(3) IV 1972-2003	(4) IV 1972-1994
Intercept	-247.88	-287.56	140.42	-138.42
	(1.14)	(1.17)	(0.34)	(0.36)
$CONS_{t-1}$		0.31	0.20	0.45
		(1.42)	(0.62)	(1.40)
PDI_t	0.95	0.76	0.65	0.77
	(18.42)	(5.52)	(2.50)	(2.60)
PDI_{t-1}		-0.07	0.06	-0.26
		(0.43)	(0.25)	(1.39)
$HWEALTH_t$	-0.07	0.16	0.63	
	(0.96)	(0.94)	(1.77)	
$HWEALTH_{t-1}$		-0.28	-0.71	
		(1.72)	(2.17)	
$Real\ Interest_t$	18.58	8.66	-28.60	19.40
	(2.39)	(0.82)	(1.01)	(1.25)
$Real\ Inteterst_{t-1}$		8.70	-46.99	-1.39
		(0.71)	(1.68)	(0.09)
R^2	0.99	0.99	0.99	0.98
p-value from Test of MPC of HWEALTH = 0	0.34	0.11	0.45	-

1. Dependent variable is consumption.
2. All variables in real per-capita terms.
3. Absolute values of t-Statistics in parentheses.
4. Instruments are: $Real\_i_{t-1}$, GC_t, GC_{t-1}, $POTY_t$, $POTY_{t-1}$

The coefficients on interest rates remain positive but are now insignificant. More importantly for our purposes, it is clear that there is no change in the basic result: most of the change in consumption is explained by changes in income. The coefficient on current housing wealth is insignificant whereas the coefficient on lagged housing wealth is borderline significant (p-value of 0.1).

A test of hypothesis that the long run MPC out of housing wealth is zero is implemented as a Wald test of the hypothesis that the sum of the coefficients on housing wealth are zero. This

[6] Specifically we perform Augmented Dickey-Fuller tests with two lags in the testing regression. The resulting t-statistics are 1.02 for CONS; 1.49 for PDI; and 2.10 for HWEALTH. All are greater than the critical value at 10 per cent significance level, which is -2.62.

[7] If the data is co-integrated then, Equation (1) in Table 3 constitutes an estimate on one of the co-integrating vectors. A test of the residuals from this regression gives an Augmented Dickey Fuller t-statistic of -4.98. This allows us to reject the null hypothesis of no co-integration at any significance level greater than 0.01. This test uses critical values reported in Hamilton (1994) p. 766. This suggests that the consumption is co-integrated with income and interest rates but not HWEALTH (as its coefficient is insignificantly different from zero).

produces a p-value of 0.11. Again we cannot reject the hypothesis that housing wealth has no effect on consumption – albeit a marginal rejection in this case.

These results stand in contrast to results for other countries. McCarthy and Steindel (2007) note that estimates using aggregate data tend to produce estimates of the MPC of above 0.05 for the US. In a similar vein, Case *et al.* (2001) found an average MPC for western countries of 0.11 using aggregate data.

Engelhardt (1996) found that there is an asymmetry in the consumption and saving behaviour of households and that consumption reacted more when house prices were declining than when prices were rising. Disney *et al.* (2002) found the opposite for the UK. We tested for asymmetry by taking the regression in column 2 and adding to it, a dummy set equal to one if growth in wealth was positive. It turned out that this dummy was insignificant (p-value of 0.12) indicating that asymmetry was not important in the Irish case.[8]

Note that, in column 2, the sum of the coefficients on housing wealth is negative, implying that increasing housing wealth *reduces* consumption. This does not seem a plausible result. This may suggest that the estimates are inconsistent due to the presence of simultaneous equation bias. Consumption is a function of income. But aggregate consumption is a component part of GDP, which in turn is the major determinant of PDI, so that income is also a function of consumption. Failure to take account of this circular relationship will bias not only the estimate of the income coefficients but also the estimates of the MPC out of housing wealth. Similarly, housing wealth itself is affected by GDP and it could be an indirect function of consumption also. In order to control for these potential biases we re-estimate the model using Instrumental Variables in the third column of Table 3. For instruments we have the lagged values of all variables and, in addition, current real government consumption per capita, potential GDP per capita and lagged real interest rates. Standard tests suggest these are reasonably good instruments.[9]

The results of the IV estimation are little different from the simple model: the current housing wealth variable is insignificant at the 5 per cent level (p-value of 0.08) while the lagged wealth is

[8] The results of this regression are available on request. Of course, the insignificance could reflect the fact that there were only 9 years during the sample when housing wealth actually declined.

[9] The regression of the endogenous variables on the instruments yields a R-squared of 0.98 for PDI and 0.98 for HWEALTH. However, F-test of the exclusion of GC, POTY, Real_i and their lags from this regression is 9.01 for PDI, 7.82 for CONS and 8.45 for HWEALTH. Staiger and Stock (1997) suggest that a value above 5 is desirable.

significant (p-value 0.04). As before, we cannot reject the hypothesis that the MPC out of housing wealth (the sum of coefficients on housing wealth) is zero.

Finally, we run the IV regression of column 3 again, but this time on a sample ending in 1994. The idea here is that the Irish economy in general and the housing market in particular grew at unprecedented rates after 1994 (see Figures 1-5). This superior performance is almost certainly a temporary phenomenon and its presence may distort our estimates of the effect of housing wealth on consumption. By restricting the sample to a period of more reasonable growth, we would hope to capture the true underlying relationship between consumption and housing wealth.

In addition we drop the housing wealth variable from the estimation equation. Unsurprisingly, given the previous results, this does not change the R-squared or the other coefficients significantly. As can be seen from column 4, the restricted sample produces essentially the same results as before.

Figure 6: Actual and Forecast Consumption

Actual Consumption

Consumption Forecast 95 per cent, Confidence Interval
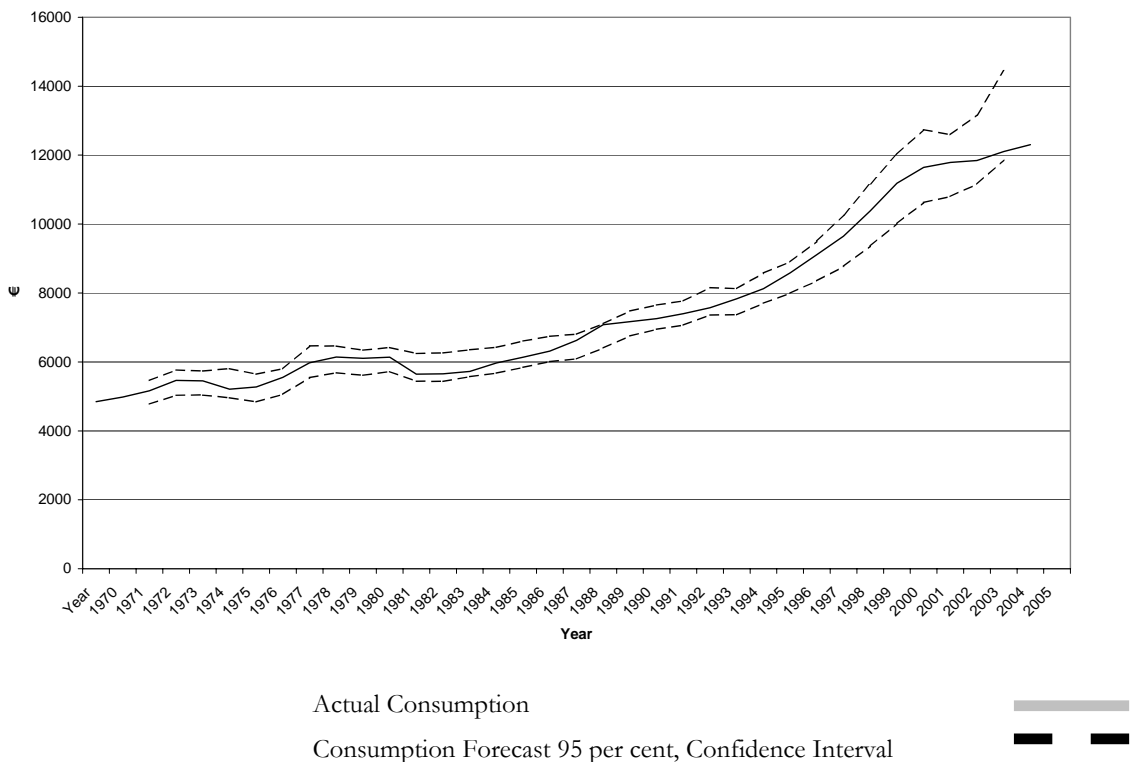
We can use this model to create a forecast of what consumption would be given income in the years 1995-2005 and compare it with the actual outcome. We present a graph of this forecast in Figure 6, where the solid line represents the actual consumption that occurred

and the dotted lines represent the 95 per cent confidence interval for the forecast. As we can see, until 2002, actual consumption is entirely within, what is a relatively narrow, forecast region. This confirms that housing wealth data is of no use in forecasting or explaining the level of private consumption in Ireland. The level of consumption as it changes through time is explained almost entirely by movements in Personal Disposable Income. Even the consumption boom that occurred in the late 1990s and was coincident with a house price boom appears to have been entirely due to the dramatic rise in real personal incomes. Housing wealth appears to have had no effect.

5. Conclusions

The results of the model indicate that the increase in real personal disposable income explains the rise in real personal consumption and the addition of the housing wealth series does not provide any extra explanatory power. The implication is that the recent increase in housing wealth has not been used to fund personal consumption. In essence, the growth in real incomes caused both the increase in consumption and house prices. In theory this would imply that households in Ireland did not believe that the boom in house prices was a permanent addition to their wealth. However, this explanation is hard to believe given the duration and the extent of the housing boom within the Irish market.

Another possible explanation is that Irish households faced liquidity and credit constraints and were unable to access the positive equity that had begun to accumulate. Anecdotal evidence would indicate that the availability of mortgage equity withdrawal has only become more widespread in Ireland in recent years, while it has been a common feature of the UK housing market for 15 years or more. Furthermore, anecdotal evidence would suggest that the vast bulk of any equity withdrawal that has occurred in the Irish market has been used for residential investment purposes (e.g. providing house deposits for children, extensions to existing properties etc.) rather than for personal consumption purposes.[10] Unfortunately, data are not published in Ireland that can identify the use of mortgage equity withdrawal and therefore it is difficult to be precise about its influence. Our suspicion, based on the anecdotal evidence, is that the latter of these reasons explains why the increase in housing wealth has not influenced personal consumption over the period under review. Further research is clearly required to confirm this.

In the short term, households may well alter their consumption and saving patterns if house prices fall but theory suggests that only a permanent fall in house prices will have a long lasting impact on consumption. Another caveat is that negative equity should only

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[10] McCarthy and Steindel (2007) suggest that this is true for the US also.

become a binding constraint on consumption if the servicing costs of the mortgage rise significantly and impact on household's personal disposable incomes. Initially, if house prices fell this would hit consumer confidence but over the longer term, if the servicing costs are not altered significantly, it should have no long lasting impact on consumption.

Furthermore, if households have not used housing wealth for personal consumption purposes to date then personal consumption would remain unaffected by a fall in house prices. This would imply that the recessionary effects of a decline in house prices would not be severe. However, this might be a bit simplistic as Engelhardt (1996) found that there is an asymmetry in the consumption and saving behaviour of households and that consumption reacted more when house prices were declining than when prices were rising. We found no evidence of such asymmetries in the Irish case.

Finally, it has to be borne in mind, that even if a decline in house prices does not affect the economy via the wealth channel examined in this paper, it may affect the economy in other ways. Kelly (2007) has shown that the Irish economy is unusual in having such a large level of housing construction. He suggests that any decline in the housing market could have a large negative impact on the overall economy via a direct reduction in investment and employment.

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