

# The housing price downturn and its effects

## A discussion

Lunde, Jens

*Document Version*  
Final published version

*Publication date:*  
2008

*License*  
CC BY-NC-ND

*Citation for published version (APA):*  
Lunde, J. (2008). *The housing price downturn and its effects: A discussion*. Institut for Finansiering, Copenhagen Business School.

[Link to publication in CBS Research Portal](#)

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

### Take down policy

If you believe that this document breaches copyright please contact us (research.lib@cbs.dk) providing details, and we will remove access to the work immediately and investigate your claim.

Download date: 23. Jun. 2024



**WP 2008 - 1**

**The housing price downturn and its effects  
– a discussion**

**by**

**Jens Lunde**

**INSTITUT FOR FINANSIERING, Handelshøjskolen i København  
Solbjerg Plads 3, 2000 Frederiksberg C  
tlf.: 38 15 36 15 fax: 38 15 36 00**

**DEPARTMENT OF FINANCE, Copenhagen Business School  
Solbjerg Plads 3, DK - 2000 Frederiksberg C, Denmark  
Phone (+45)38153615, Fax (+45)38153600  
[www.cbs.dk/departments/finance](http://www.cbs.dk/departments/finance)**

**ISBN 978-8791889-06-6  
ISSN 0903-0352**

Jens Lunde  
Associate Professor  
Department of Finance  
Copenhagen Business School  
Solbjerg Plads 3  
DK 2000 Frederiksberg  
Denmark  
Phone: + 45 3815 3617  
Fax: + 45 3815 3600  
e-mail: [jl.fi@cbs.dk](mailto:jl.fi@cbs.dk)

*Article for Journal Clm.economia special issue on housing economics*

## **The housing price downturn and its effects – a discussion.**

### *Abstract:*

Housing markets in several countries are suffering. The prolonged and strong housing price rises of recent years have turned around. Historical records suggest that housing price drops may happen slowly but be large. Housing prices continue to fall because capital losses have substituted capital gains, housing equities are falling, and housing price expectations have become negative. Household debt had increased to the same degree as housing prices or even more in some countries. Access to mortgage and credit had improved and lenders used “cruise control” when financing still higher housing market prices. Now, housing demand is further weakened because access to credit has been tightened.

During a downturn, owner-occupiers’ housing price risk is increased and a growing number of owners have negative equity and payment troubles. Under these conditions, arrears and foreclosures will be widespread in owner-occupation.

The effects on the wider economy of a housing price downturn are discussed. Not only does the lenders’ increased credit risk lead to tightened credit access, losses threaten the banks and can create financial crises. Falling housing prices clearly depress the housing market and housing construction activities and thereby the contribution of residential investments to economic growth, while it is less obvious that average housing consumption and residential investments over the whole cycle are affected. The reduction of non-housing consumption as a result of a wealth effect is a reality for years for depressed owner-occupiers but in the aggregate, the housing wealth effect is more dubious.

**Keywords:** housing cycles, housing prices, housing wealth, housing crises, housing and mortgage debt, financial soundness, financial stability, financial crises.

**JEL Classification:** D14, E21, E32, E44, E50, G21, R20.

*“I think perhaps I can too.  
But I try not to borrow.  
First you borrow. Then you beg.”*

*Ernest Hemingway: “The old man and the sea.” 1952. (Reprinted January 1955, p. 14)*

## **1. Motivation.**

Housing markets in several countries are suffering. Daily, the news and financial bulletins bring still more sad stories about falling housing prices, mortgages and lenders in decline, arrears and foreclosures. This article tries to depict the serious housing price downturn and its effects.

IMF’s latest market update of their Global Financial Stability Report from July 2008 began alarmingly: *“Global financial markets continue to be fragile and indicators of systemic risk remain elevated. Credit quality across many loan classes has begun to deteriorate with declining house prices and slowing economic growth.”* (IMF, 2008b). And, on the housing market news, the update continues later: *“The growing concern is that, with delinquencies and foreclosures in the U.S. housing market rising sharply, and house prices continuing to fall, loan deterioration is becoming more widespread.”* ... *“Stemming the decline in the U.S. housing market is necessary for market stabilization as this would help both households and financial institutions to recover. At the moment, a bottom for the housing market is not visible: however, some recent developments in affordability may provide support for house prices to stabilize. House prices are softening in a number of other OECD economies (notably Ireland, Spain, and the United Kingdom), prompting concerns over future loan losses in the mortgage, construction, and commercial property areas.”* (IMF, 2008b). Other European countries could have been mentioned too.

In April 2008, IMF presented an analysis in which the house price growth was explained by fundamental factors (growth in disposable income per capita, short-term interest rates, long-term interest rates, credit growth, and changes in equity prices and working age population). The unexplained increase in house prices, the so-called “house price gap” could be used to identify which countries may be particularly prone to a correction in house prices. For 13 of the 17 countries analysed, the “house price gap” was between 10 and 30%. (IMF, 2008a, pp 113-116).<sup>1</sup>

The house price-to-income ratios in many countries had reached all-time high peaks, for the U.S. in 2006 and for many European countries in 2007: *“2007 will probably go down in history as the year that the great European house price boom ended.”* (Ball, 2008, p. 5). The preceding strong rises in the countries’ real house prices had been unprecedented in size and duration (Girouard et al., OECD, January 2006). No one has attempted to estimate the duration of the future downturn in the countries’ house prices.

Since 2006-2007, information on the housing market, tightening credit conditions and financial failures has become increasingly alarming in the US and Europe. Furthermore, recession economies may develop in several countries to act as “triggers” for further housing market downturns. The above-mentioned IMF GFSR market update looks like the most serious official announcement to date (July 2008).

Therefore, we have every reason to identify and analyse the house price downturn and its effects.

---

<sup>1</sup> However, IMF’s use of a uniform specification for all countries examined makes no allowance for the specific national housing market situation, and the “house price gap” may therefore be too high or too low. For example, IMF estimated the Dutch “house price gap” to be app. 30%. However, the official Dutch model includes housing supply as a fundamental factor, with the result that in 2003, house prices were approximately 10% overvalued in the Netherlands, while absolutely no house price overvaluation existed any longer in 2007. (Krandendonk and Verbruggen, 2008).

## 2. Introduction

The size and the duration of the real house price increase up to 2006-07 were unprecedented. Moreover, property owners' access to mortgages was facilitated through new or improved systems, new mortgage loan types, "improved" mortgage payment conditions, and not least, extraordinarily low interest rates. Often, these financial improvements have been seen as drivers of house price inflation; see, for example, Green and Wachter (2007), Muellbauer (2007), Mishkin (2007), Laemer (2007), Case and Quigley (2008) and Scanlon et al. (2008). Also, in relation to the US market, a weakened credit valuation and dramatic deterioration in mortgage underwriting standards have often been mentioned, (Mishkin (2007, p. 387), (Case & Quigley (2008, p. 178).

Low interest rates were a "fundamental factor" behind the housing price increases and made it possible for the owner-occupiers to service higher debt. From 2001 and up to 2005, the central banks cut short-term interest rates, thereby implicitly sending construction back in time from 2006-2008 to 2003-2005, as pointed out by Laemer (2007, p. 154). This monetary policy stopped due to an increasing risk of permanently higher inflation. *"The historical record strongly suggests that in 2004 and 2005 we poured the foundation for a recession in 2007 or 2008 led by the collapse in housing we are currently experiencing."* (Laemer, 2007, p 154). In addition, housing price bubble tendencies with unrealistically strong housing price rise expectations were found in many countries.

The housing crisis came out of nowhere – or did it? Housing markets began to deteriorate when the steep housing price rise softened and turned around. The background for the housing price downturn cannot be found in any special "trigger factor" or "shock". *"I would note that the turmoil in financial markets emerged at a time when the economy was otherwise in pretty good shape."* (Mishkin, 2008). Earlier he concluded that *"as events illustrate, under certain conditions the housing sector can be a source of financial instability."* (Mishkin, 2007, p. 387).

But was the only cause the previously steeply rising housing prices, or did the financial system and lenders contribute? Rising housing prices forced lenders to expand their credit, and access to credit was a prerequisite for the high housing prices. But the "automatic cruise control" method of automatically financing the existing market prices for flats and houses has also made it possible to capitalize on low payments as high house prices. The cause-effect relation is not obvious.

Strictly speaking, a housing price downturn is part of an ordinary housing market cycle, but it has wide implications for the whole economy. Laemer has found that housing and residential investments do not contribute more to the general economic development than production in other sectors. But housing is the most important sector in economic recessions, and in general, recessions in the U.S. have been preceded by substantial problems in housing. (Laemer, 2007).

The emergence of a housing market downturn is a major threat to the financial sector. The lending banks face a high risk of credit losses when house and property prices fall. A housing collapse has been correlated with the emergence of financial crises in many instances and housing crises have driven financial crises. It remains an open question whether falling house prices can be the sole driver of a financial or banking crisis or whether some other "trigger" factor has to be active. However, recessions are taking hold in several countries.

Prices for petrol, raw materials and food have increased inflation rates, leading the central banks to tighten monetary policy and increase interest rates somewhat. The rising prices have reduced real

disposable incomes and tightened the liquidity of families. Prices started to rise after the housing markets began to soften, and while it is less likely that inflation could trigger a collapse of the housing market by itself, it could intensify the housing market effects.

Recently, Case and Quigley have analysed how the reversal of booms in the housing market affected the rest of the advanced economy and considered different types of related effects. *Wealth effects* reduce households' spending capacity and lead to a contraction in consumer spending when asset values fall. *Income effects* will be large and constitute the reduced employment and income from the lower activity in terms of sales of existing houses and the decline in housing construction etc. The last group, *financial market effects*, contains the many possible consequences for actual and new borrowers, investors in mortgage bonds and other mortgage claims, and the lenders themselves; with the collapse of the sub-prime mortgage-backed security market as the most important institutional effect. (Case & Quigley, 2008).

The paper is organized as follows: First, the background is presented through a discussion of the housing price cycles, improved access to mortgages and credit expansion. Next, a possible course of the housing market downturn is described, taking into consideration some drivers of the falling housing prices and the possible development in the owner-occupiers' debt. Then, the risks and bad outcomes for owner-occupiers in a housing market downturn are outlined, followed by a section on lenders' risks and possible reactions as well as the risk of financial crises. Next, the effects of weakened housing demands on housing consumption and building activity as well as the contribution of residential investments to the wider economy are considered. Finally, it is argued that the falling house prices will reduce non-housing consumption considerably for financially stressed owner-occupiers, although in the aggregate this wealth effect is weak, if at all existent.

Housing prices have followed the same patterns to a high extent in countries with developed mortgage and financial systems, even though national housing markets have different structures. Legal institutions and rules also differ somewhat between countries, especially with regard to arrears, repossessions and foreclosures. This institutional dimension in general is not discussed here, but a great deal of the data and therefore, unavoidably, the institutional basis is from Denmark. In this regard, it is relevant to mention that the paper is based on existing literature and the author's professional experience from two Danish housing crises in 1979-1983 and 1987-1993, each involving a 33 % drop in real house prices and a high number of foreclosures.

## **BACKGROUND**

### **3. Housing price cycles – and their way downwards.**

Cycles in real house prices look like "big waves" and last for several years. They do not take the shape of regular sinus waves but rather irregular waves, which seem to last longer and have larger amplitude than business cycles. The cycles in real house prices since 1970, with peaks and bottoms in between, have been documented for 18 OECD countries (Girouard et al., 2006). House price changes are compared over many years with different inflation levels, and therefore, real prices are used. However, falling nominal house prices represent a more serious housing market threat since debt is nearly always written in nominal terms.

In the years after 1970, most countries have experienced two-three upturns as well as downturns in real house prices and both phases have lasted around five years on average as seen in Table 1. The average real price increase for the 18 countries included was 45.6 %, while the average downturn in

real house prices was 23.3 %.<sup>2</sup> The data are also presented for four countries with somewhat different housing market traditions to illustrate the variability between the countries. However, all countries in the study have experienced remarkable upturns and downturns in real house prices during the 35 years studied.

Table 1.

Major real house price cycles, examples for some countries. 1970-2005Q1.

	Average for the 18 OECD countries	U.S.	Germany	Denmark	Spain
<b>Upturns:</b>					
- number	2.7	3	3	2	3
- average duration	22.7 q	17.4 q	21.3 q	25.0 q	15.0 q
- average real price change	45.6 %	15.3 %	12.1 %	44.3 %	63.6 %
- maximum duration	32.7 q	23 q	27 q	37 q	23 q
- maximum real price change	67.6 %	17.0 %	15.7 %	56.5 %	134.8 %
<b>Downturns:</b>					
- number	2.6	3	2	2	3
- average duration	18.5 q	14.3 q	16.5 q	21.5 q	19.3 q
- average real price change	- 23.3 %	- 9.9 %	- 10.7 %	- 36.2 %	- 21.6 %
- maximum duration	25.4 q	21 q	25 q	29 q	31 q
- maximum real price change	- 32.4 %	- 13.9 %	- 15.3 %	- 36.8%	- 32.2 %
<b>Last upturn:</b>					
- period*		1995Q1- 2005Q2	1976Q2- 1981Q2	1993Q- 2004Q3	1996Q4- 2004Q4
- price increase		52.7 %	15.7 %	93.4 %	114.2 %

\* With the exception of Germany, these periods end because the authors published in January 2006.

Note: q = quarters

Source: Girouard et al. (OECD, 2006)

The “long waves” express the existence of some autocorrelation patterns in house prices as earlier documented by Englund and Ionnides (1997). This is consistent with the frightening conclusion of Girouard et al.(2006, p. 4): *“the historical record suggests that the drops (in real terms) might be large and that the process could be protracted, given the observed stickiness of nominal house prices and the current low rate of inflation.”*

Unfortunately, since 1970 no soft landings in real house prices have been seen in the 18 OECD countries analysed. On the basis of house price data up to 2005, Girouard et al. point out that *“a number of elements in the current situation are unprecedented: the size and duration of the current real house price increases; the degree to which they have tended to move together across countries; and the extent to which they have disconnected from the business cycle”* (Girouard et al., 2006, p. 4). In reality, in many countries, house prices seemed to be at their highest point ever in 2007. It seems to be simple logic that house prices cannot increase more than consumer prices forever, i.e. the rise in real house prices must stop some day. Shiller spotted that simple logic in a headline in “Irrational Exuberance”: *“What went up usually came back down”* (Shiller, 2005, p. 142).

Most housing market models contain a “long-run equilibrium price”, to which house prices will be drawn in a never stopping imbalance. The larger the difference between the actual house prices and the “long-run equilibrium price” is, the stronger the pull of the house prices away from the actual

<sup>2</sup> If house prices increase by, for example, 45.6 %, they have to fall 31.3 % to return to the starting level.

path and back to this equilibrium price. This adjustment happens gradually and is one of the causes of time lags in the models.

In fact, high house prices do forecast lower future house prices. Ludvigson has shown “*that a high price-dividend ratio for the U.S. housing market is associated with slower and sometimes negative real housing wealth growth over a subsequent three year horizon*” (Ludvigson, 2007, p. 340).

As a special feature, housing price are sticky downwards, “*and when demand softens as it has in 2005 and 2006, we get very little price adjustments but a huge volume drop.*” (Laemer, 2007, p. 153). “*Every housing downturn, national or regional, begins with an excess supply of available dwellings, in most cases because demand has declined.*” (Case and Quigley, 2008, p. 164). In the short run, the supply of residential property is fixed. When demand drops, sellers hold out at the “sticky price”, thereby increasing the spread between bids and ask prices, and agreements are not reached (Case and Quigley, 2008, p. 165). Therefore, downward adjustments of house prices are prolonged processes, while adjustment reactions in the upturns are quick. A feature of the turnaround in Danish house prices has been that the number of flats and houses for sale more than doubled after February 2006, while the number of sold units fell significantly but to a lesser extent.

To illustrate the real house price development up to 2008 and the fact that the changes have been highly synchronized across countries in recent years, real house price indices for the U.S., Denmark and Spain are shown as examples. Turnarounds in real house prices have occurred in these three countries as well as in other countries. For example, the average house prices in the UK have dropped over the last ten months according to the Halifax index.<sup>3</sup>

In Figure 1, the Shiller index<sup>4</sup> shows real house prices in the U.S. from 1890 to 2007. This index is the most used and cited house price index for the U.S. The index was published in “Irrational Exuberance” and has been updated on the author’s home page<sup>5</sup>. Remarkably, when Shiller first presented the figure he “[noticed] the striking recent behaviour of home prices since the late 1990s. The home price market has taken off sharply. There has been a “rocket taking off” here, just as in the stock market in the mid-1990s”. Real home prices for the U.S. as a whole increased 85 % from 1997 to the maximum in 2006. After the peak in the first quarter of 2006, the rocket started to crash and the turnaround was followed by dramatic falling nominal house prices in 2007; outside Figure 1, the drop was 16 % from May 2007 to May 2008 according to the Shiller index.

---

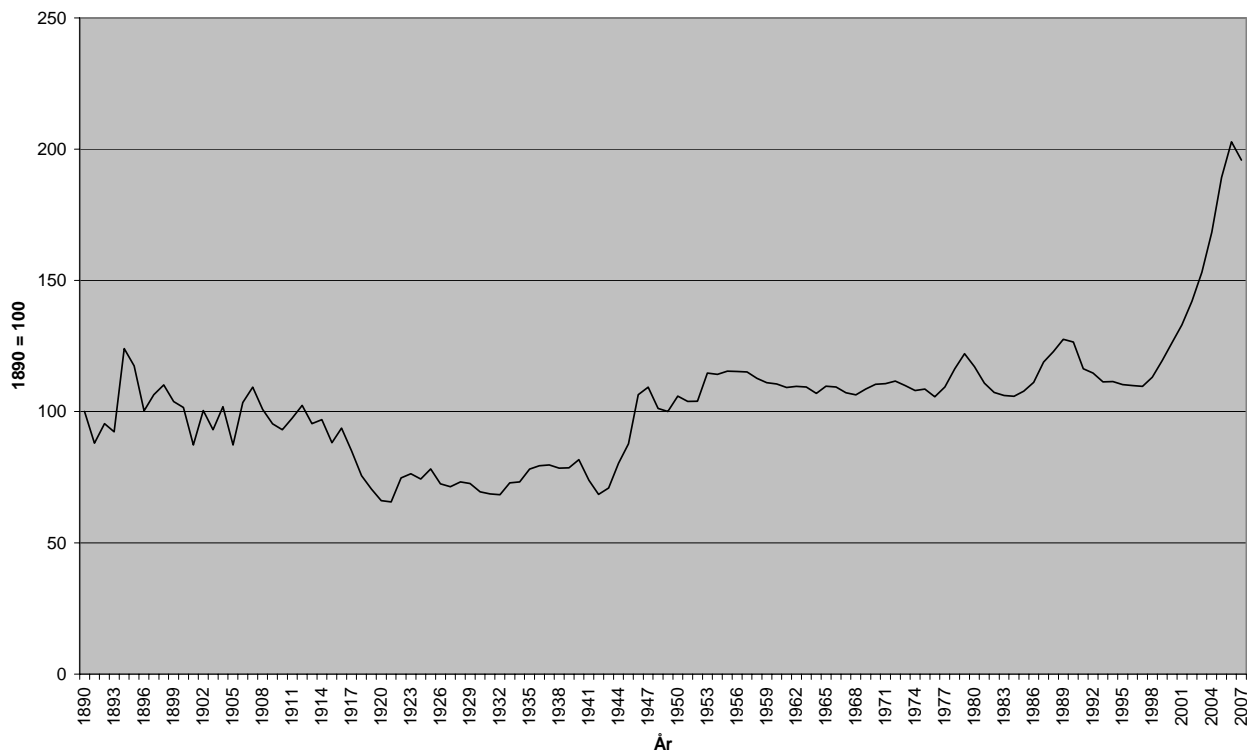
<sup>3</sup> According to Ball (2008), nominal house prices fell already in 2007 in Ireland, Germany, Greece, Estonia, Denmark and Portugal.

<sup>4</sup> Other names in the literature are the Case-Shiller index and the S&P/Case-Shiller index.

<sup>5</sup> <http://www.irrationalexuberance.com/Fig2.1Shiller.xls>



Figure 1.  
Shiller's index for real house prices in the U.S. 1890-2007, annual.

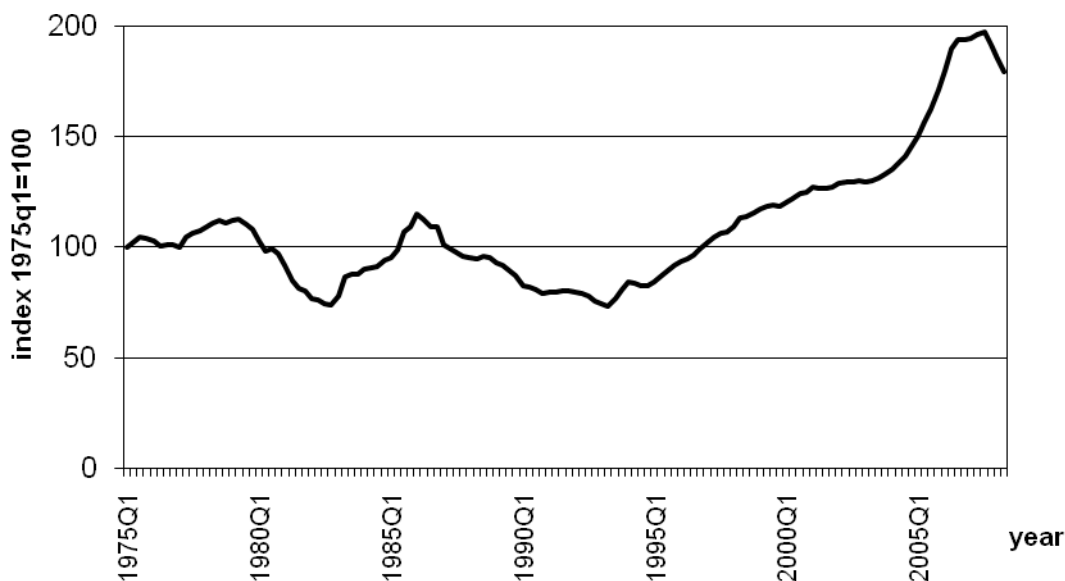


Even though Shiller's index covers 117 years, a "long-run equilibrium" price for the U.S. cannot be clearly identified. What can be determined, at least a) an equilibrium price might be below the price level as met after 1997, and b) over the 117 years, no substantial long-run up-trend in real home prices can be identified, as further discussed by Shiller (2005, p. 20 ff).

As emphasized, the development in real house prices has been highly synchronized, also across the European countries. Real house prices in Denmark from 1975 to 2008.Q2 are presented in Figure 2. The curves for the U.S. and Denmark have many similarities, including two bulges after 1975. The U.S. had maxima points in 1979 and 1989 and Denmark in 1979 and 1986 and both have a "rocket taking off" from 1997 and 1993 respectively. Even the increase in real home prices after 1997 was identical: 85 % in the U.S. until 2006 and in Denmark until 2007. However, from the former bottom in 1993 to the maximum in 2007, real house prices in Denmark had increased 169 %. Now real house prices are falling in both countries.

To identify a "long-run equilibrium" real house price level for Denmark is difficult too. The curve does not give clear signals but at the long-run equilibrium level, the construction of new dwellings must be profitable. Since around 1980 and up to around 2000, the construction of houses and flats for owner-occupation, private rental and unsubsidized private cooperative housing was relatively limited.

Figure 2.  
Real house prices in Denmark. 1975-2008.Q2, quarterly.



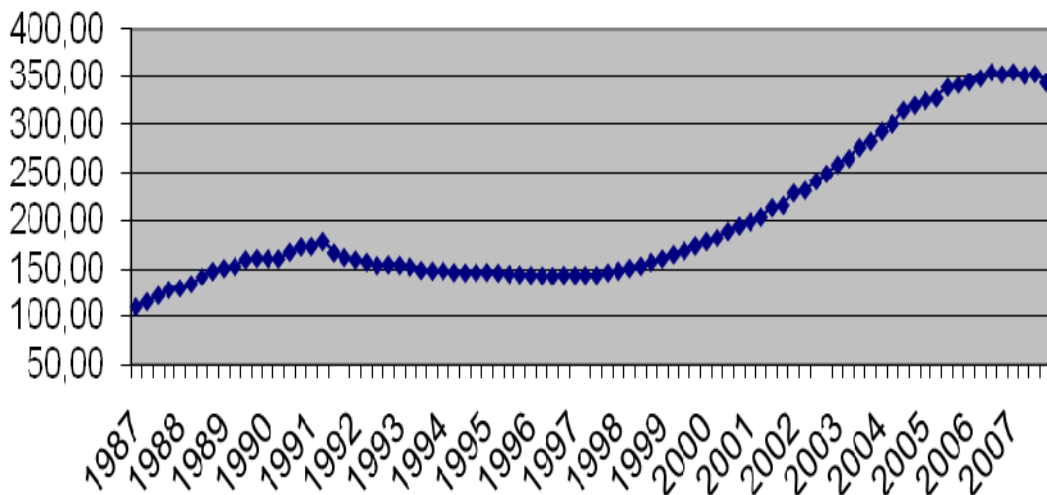
Source: Monadata, quarterly house price index, deflated with the implicit consumer price deflator. After 2005 data from Statistics Denmark and (the last quarter) from Realkreditrådet. Figure by cand.polit Henrik Pedersen and Jens Lunde.

The real house prices for Spain for the years 1987 to 2008 in Figure 3 are based on statistics from Bank of Spain. From 1997 to the first quarter of 2007, the increase in Spanish real house prices was 149 %; an even steeper increase than in the U.S. and Denmark in the same years. A good partial explanation was given by Hoeller and Rae in an OECD paper: *“In some smaller economies that experienced a sharp decline in interest rates before entering the monetary union the boost was compounded by a steep rise in house prices, especially so in Ireland and Spain.”* (Hoeller and Rae, 2007, pp. 7-8). They also point out that Spain’s high income growth has been an important driver for house prices and that both Ireland and Spain experienced building booms. In total, real house prices for Spain increased 256 % from 1987.Q1 to the max in 2007.Q1.

Real house prices in Spain did start to fall in 2007 as a result of a weak increase in nominal house prices during 2007 and higher increases in consumer prices. In the beginning of 2008, Spanish nominal house prices started to fall too.

Downturns in Spanish house prices have been seen before. A closer inspection of the changes in the Spanish real house prices reveals that 1996 was the end of the period of falling real house prices that started in 1991. Also, outside the figure, in the years 1978 to 1986, real house prices fell 32 % in Spain, while minor increases occurred in the periods 1970 to 1974, 1976 to 1978 and 1986 to 1991 (Girouard et al., 2006, Table 2).

Figure 3.  
Real house prices in Spain. 1987-2008.Q2, quarterly. 1987.Q1 = 100.



Source: Bank of Spain.

A preliminary conclusion must be that the real house price cycles contain many similarities and structurally serious upturns and downturns. In the three countries studied, the turnaround in real house prices is over, and prices have now started to fall here as in some other countries. The prolonged upturns in real house prices ended in 2006 in the US and in 2007 in Europe.

#### 4. The credit expansion and improved access to mortgage.

The beginning downturn in housing prices would only have a weak influence on the housing market and the wider economy, *if* mortgages or other credit were not available and houses and flats had not been used as collateral. Also, in theory, the demand for loans would be non-existent, *if* we all were “old men” in Hemingway’s sense and “try not to borrow” because we did not want to run the risk of “then you beg”. Without mortgages or other debt, a house price fall would make the established owner-occupiers less wealthy in a formal sense but at the same time, the net present value of their future user costs in the house would be reduced to a similar extent. On selling, the wealth reduction represents a capital loss for the seller and an identical gain for the buyer. Compared with a possible access to credit, it seems plausible to expect that in this case, a house price downturn would be much weaker, the volatility in house prices lower, and real house price cycles dampened.

It might be tempting to make the opposite hypothesis that the higher the owner-occupiers’ debt is compared to housing wealth and income and the easier the access to credit, the stronger are the effects of a housing price downturn and the higher the volatility in real house prices. The volume of mortgage and other credit has increased more or less to the same degree as house prices during the steep and long rise in real house prices up to 2006-07, as facilitated by easier access to mortgages and mortgage loans with lower payments. Often, credit expansion, low interest rates and financial improvements have been seen as drivers in explaining the house price inflation, see, for example,

Green and Wachter (2007), Muellbauer (2007), Mishkin (2007), Laemer (2007), Case and Quigley (2008) and Scanlon et al. (2008).

The remarkable expansion of household debt in general was confirmed in a study of 15 OECD countries for which data were available by Girouard et al. One of their main findings was: *“The rise in household debt, in particular mortgages, to historical levels in a number of countries has been driven by a combination of favourable financial conditions and buoyant housing markets. There have been, as well, a number of supply-side innovations in credit markets that have eased the access to credit for lower-income borrowers and reduced financial constraints for first-time homebuyers.”* (Girouard et al., 2007, p. 5)

Household debt/GDP ratios were included in this study and on average nearly doubled from 1985 to 2005; especially after 1995. Denmark had the most indebted households with a ratio close to 120 % (for 2004), the Netherlands’ ratio (for 2005) was nearly the same, while Great Britain had a ratio just above 100 % and the U.S. slightly below 100 %. Spain, the third country whose real house price changes were discussed above, had a ratio close to 70 %.

The expansion in household debt in the OECD countries was seen in the household debt/disposable income ratios, too, as shown in Table 2. Again, on average, the Danish households were in front with a debt of 260 % of disposable income in 2004. Only the Netherlands had a ratio of a similar size (in 2005). The ratios were remarkable lower in the US, Great Britain, and Spain as in the other OECD countries. (Girouard et al., 2007). Household debt has continued to grow after 2005. For example, in Spain *“overall, the household debt reached 125% of disposable income in 2007 – three quarters of it related to mortgage.”* (Ball, 2008, p. 93).

*Table 2.  
Household debt in per cent of disposable income. 1995, 2000 and 2005.*

PER CENT	1995	2000	2005
United States	93	107	135
Japan	130	136	132*
Germany	97	111	107
France	66	78	89
Italy	32	46	59
United Kingdom	106	118	159
Canada	103	114	126
Australia	83	120	173
Denmark	188	236	260*
Finland	64	66	89
Ireland		81	141
Netherlands	113	175	246
New Zealand	96	125	181
Spain	59	83	107*
Sweden	90	107	134

Source: Girouard et al., 2007, p. 9.

Note: Debt refers to total liabilities outstanding at the end of the period. – \* for 2004 instead of 2005.

The low interest rate regime throughout this decade can explain a good part of the house price rise as documented in many house price models, where interest rates are included as a “fundamental” factor. As the stock of housing is given in the short run, low interest rates can be said to be capitalized as high house prices. Furthermore, low interest rates render it possible for borrowers to

obtain and to service a higher debt than at higher interest rates, which was definitely a cause of the strong increase in the volume of mortgage and other outstanding debt.

The specialized mortgage credit has expanded a lot in recent years. The European residential mortgage debt to GDP ratios have increased greatly throughout the 1990s and up to at least 2006 (EMF, 2007, Table 1), see also Scanlon et al. (2008). The ratios for some countries have shown tremendous growth rates, because they started at a very low level, indicating that a mortgage system had been introduced a few years before. For other countries, the growth indicates that access to mortgages has been liberalized. The countries with a mature mortgage system had the highest ratios: Switzerland, 101.9%, Denmark, 100.8% and the Netherlands, 98.4%. These countries have had a weaker but nonetheless remarkable growth in outstanding mortgage debt.

Compared to housing finance in the UK and the U.S., inside “*the Euro-currency market, mortgage finance institutions underwent even greater transformation, given their historical greater government involvement*”. As an example, in Spain the central bank regulated the savings and borrowing interest rates, while the government regulated the mortgage loans until the mid-1980s. Then commercial lending institutions were allowed, which expanded the access to and volume of mortgages. (Green and Wachter, 2007, pp. 23-24).

The availability of mortgage credit has been supported by several means. Some maximum loan-to-value and loan-to-income ratios have been lifted and other credit constraints relaxed by governments or by lenders (Muellbauer, 2007, pp. 274-276). Furthermore, improved or new mortgage loan product types have been introduced to reduce borrowers’ payments. The use of variable interest rates or adjustable interest rates (i.e. short-term fixed interest rates) instead of long-term fixed interest rates reduces payments when the yield curve is increasing, but greatly changes the mortgage risk features.<sup>6</sup> Also, the maximum terms of mortgages have been lengthened in several countries over the last decade (Scanlon et al., 2008, p. 127). In the U.S., teaser loans and interest-only mortgages were among the subprime loan types. Especially interest-only mortgages reduce debt services considerably in the initial period. They were introduced starting in 1995 in several European countries, Australia and Korea, or existed already (Scanlon et al., 2008).

These changes rendered it possible for borrowers to service higher debts and for lenders to expand lending volumes, and thereby had a direct stimulating influence on housing prices at sales. This market reaction is in clear conflict with the financially correct statement that the net present value of a loan, obtained at market conditions, will always be zero, and the Miller-Modigliani thesis that the price of an asset (or a firm) does not vary with its financing structure. However, in practice, when houses and flats are sold around the world, buyers (and borrowers), real estate agents and bankers focus on payments.

Furthermore, some indirect one-time effects may be overlooked on the market. Improved mortgage conditions also reduce the supply of flats and houses for sale in the short run. These improvements allow owner-occupiers to remain in homes they otherwise would have been unable to pay for because of, for example, a divorce, sickness, unemployment, or retirement. Especially the introduction of interest-only mortgages had this effect, (Scanlon et al., 2008). Therefore, one-time mortgage improvements reduce the supply of housing units and increase property prices until more

---

<sup>6</sup> Adjustable rate mortgages were introduced in 1996 in Denmark, just before the country would have had 200 years of long-term fixed interest rates only. At the maximum adjustable mortgage rate, mortgages covered half of the owner-occupiers’ outstanding mortgage debt.

housing is built, which subsequently reduces housing prices. Green and Wachter found that “*if homeowners understand that declines in interest rates and mortgage innovations are one-time effects, then the changes will lead to a stable and higher equilibrium house prices.*” (2007, p. 30). This understanding is not found on the markets, which is why one-time events create extra volatility.

Financial liberalization made it simple to withdraw housing equity in many countries, as “home equity loans” (UK) are sometimes not separate from other mortgages (Denmark). When equity withdrawal through a mortgage loan became possible in Denmark in 1993, owner-occupiers took the opportunity to maintain or even increase their debt level. In fact, Danish owner-occupiers over 60 years of age have increased their net liability/housing wealth ratios since 1993 (Lunde, 2005, 2008). It might be added that this change may have reduced the supply of flats and houses for sale for some years – and increased housing prices to some degree after 1993.

In relation to the subprime crisis in the U.S., it is a well-known fact that underwriting procedures were slackened. Mishkin confirmed that the slackening of mortgage underwriting practice “*probably boosted housing demand in 2005 and 2006, and the evident sharp reduction in non-traditional mortgage lending this year is, no doubt contributing importantly to the extent and persistence of the weakness in the housing market.*” Mishkin (2007, p. 387).

Financial representatives in Denmark, and possibly throughout Europe, have been very eager to explain that we have no subprime market and loans. However, as seen in Table 2, in many European countries, the mortgage and credit volume has increased to a similar degree as in the U.S. Denmark has no teaser loans, but there are interest-only mortgages with a 10-year interest-only period; in June 2008 they accounted for 46% of the outstanding mortgage debt, and 46% of the interest-only mortgages carried annually adjusted interest rates (Danmarks Nationalbank, 2008).

Possibly the highest credit risk is found in the lenders’ *cruise control* in financing houses and flats at market prices, which is in accordance with rules and financial practice. When *market prices* at buying and estimated house prices at equity withdrawal are accepted when calculating the loan proceeds for the borrowers, this creates an *automatic response to higher housing prices*.<sup>7</sup> By this process, *any market price* can be financed, as long as the borrower is deemed able to pay the future debt services; *even though the market price can be far removed from a “long-run market price”*. If dramatic decreases in housing prices occur in coming years, the potential large distance between these prices and the prices of recent years will reveal high credit risks for the banks.

## **A POSSIBLE COURSE FOR THE HOUSING MARKET DOWNTURN**

### **5. What is driving the downturn of housing prices?**

The “highlight” of Girouard et al. (2006, p. 4), predicting on the basis of historical experience that drops in real house prices may be large and protracted, is unsatisfactory unless the behavioral economic mechanisms working behind it are identified and considered probable. And just to reverse the “fundamental” “bubble” discussion of why housing prices rose so explosively in recent years is equally unsatisfactory. Housing markets in many countries have been climbing up the steep house price mountain and are over the peak. What will the descent be like? Below, some operating mechanisms in this type of housing market are outlined.

---

<sup>7</sup> This is the case for Danish mortgage and commercial banks and probably most other mortgage systems and markets.

When a downturn in the housing market is demand-driven or due to an extraordinarily high increase in housing supply, downwardly sticky house prices are at work. This is observed as an increasing number of units offered for sale. Possibly, housing price expectations may have turned around, too, as in Denmark (see Table 3 below); in other words, some potential buyers have a “wait and see” attitude and some disappear from the market until prices drop in future. The sellers are reluctant to reduce prices and try to hold on to the “sticky prices”. They meet only few potential buyers on the market and see their price reductions running after the market’s downturn. Selling times increase dramatically. Some sellers withdraw their houses or flats from the market, others rent their dwelling out for some years while waiting for a “better market” in the future, and some end up with a lack of liquidity and negative equity after a forced sale or even a foreclosure. However, many units are sold at prices which are observed as market prices but are in reality “sticky prices” as they do not clear the market, see also Case and Quigley (2008, p. 165).

Using UK data for 1969-2005, Meen has demonstrated that house prices are sticky downwards, and the results “*suggest strongly that asymmetry matters and the overall fit of the equation improves slightly... expectations have a bigger (positive) effect in the upturn and that negative expectations have no significant effect on current prices, i.e. sellers are unwilling to reduce prices. Therefore, there is no autoregressive element to prices in the downturn.*” (Meen, 2006, p. 9)

During the upturn, an expectation of high capital gains were widespread, and as this was consistent with an extraordinarily high expected yield to maturity from investments in residential properties, speculative investments increased. Anecdotes existed about investments in flats, possibly newly built units, where the owners tried to capture capital gains without even renting them out in the meantime. On the Danish market, parents invested in flats for their children and did not sell them when the children moved out because they anticipated capital gains. For the same reason, some owner-occupiers did not sell their flat or house when they bought another one. Investors bought flats that were expected to be completed one or two years later; in fact, a forward contract was bought one or two years ahead, at which time they often expected to sell their present flat or house, i.e. they had a housing price risk on two units. Some investors just bought a flat, a summer house or (several) forward contracts. These speculators expected to sell when housing prices started to fall, but were not always able to. Such failed speculations have added to the supply of housing units for sale.

When housing prices began to increase steeply, families bought cheap flats to gain a foothold on the housing ladder. They expected and later realized a gain in equity, which was used to move up to the next rung on the ladder with a solid down payment. The housing ladder caused part of the high house price increases. Since the turnaround, capital losses have replaced capital gains; this has totally destroyed the housing ladder until the next upturn – unless repayments of mortgages create the equity for trading up the ladder.

Steeply rising house prices practically destroy families’ incentive to save up for a down payment. Most families cannot see the point of saving when the annual increase in prices is much higher than the possible saving.<sup>8</sup> When house prices are falling, families will not necessarily save more for a down payment because of the high risk of losing savings invested in a down payment through a further fall in house prices.

---

<sup>8</sup> Most households do not accept the advantage of an equity buffer for managing house price risk and other risks in periods when house prices are increasing.

Since the housing price upturns, house price expectations have changed radically, perhaps all over the world. Danes' expectations are shown on Table 3; unfortunately expectations were not measured between February 2006 and March 2007 when a strong turnaround in expectations occurred. The maximum prices for Danish owner-occupied flats were seen in 2006.Q3 and for houses in 2007.Q3. Therefore, the Danes expected falling house prices before they actually turned around.

Table 3.

House price expectations. Denmark. (Monthly questionnaire - around 1000 respondents).

Question: "Do you expect that house prices will increase or fall over the next 12 months?"

	APRIL 05	OCT- 05	FEB- 06	MAR- 07	JUNE 07	AUG- 07	JAN- 08	FEB- 08	MAR- 08	APRIL 08	MAY 08	JUNE 08
Increase	68%	73%	69%	24%	26%	17%	11%	17%	24%	22%	16%	17%
Fall	9%	8%	7%	44%	41%	52%	63%	50%	37%	45%	50%	61%
Unchanged	17%	16%	20%	29%	26%	27%	20%	27%	35%	29%	28%	18%
Do not know	6%	3%	4%	4%	6%	4%	5%	6%	4%	4%	5%	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Net	<b>59%</b>	<b>65%</b>	<b>61%</b>	<b>-20%</b>	<b>-15%</b>	<b>-35%</b>	<b>-52%</b>	<b>-33%</b>	<b>-12%</b>	<b>-24%</b>	<b>-34%</b>	<b>-44%</b>

Source: Greens Analyseinstitut. July 2008.

The shifts in expectations have had tremendous consequences for housing prices and markets; this can be seen through the user costs  $uc$  for an owner-occupied house:

$$uc = K_t \cdot (i \cdot (1 - T) + d + m + T_{ow} - p_h) \quad (1)$$

where  $K_t$  is the value of the house,  $i$  is the risk adjusted interest rate,  $T$  is the tax rate for interest income and/or interest expenditures,  $d$  is the rate of depreciation for the wear and tear of a house,  $m$  is maintenance and service costs,  $T_{ow}$  is the special property tax rate for owner-occupied housing, and  $p_h$  is the rate of increase in house prices.

When the expected rate of price increase  $p_h$  is high, in practice above 8%, the expected user costs are negative, i.e. the owner-occupiers "are paid for living in the house". In contrast, when house price expectations are negative, they add to the expected user costs and the (expected) user cost percentage can be rather high. Recognize, for example, that with the recent fall in the house prices in the U.S., realized user costs for the past year are above 20%.

It should be impossible to overlook the fact that expectations of increasing house prices and low (or even negative) user costs must be capitalized as higher house prices immediately and that, in the opposite situation, expectations of falling house prices must be capitalized as lower house prices. Intense discussions have been going on in some countries of the existence of a bubble in the housing market. Case and Shiller (2003) included expectations of real capital gains on the housing market among the bubble criteria.



Given the negative house price expectations of recent and possibly future years, there exists some possibility that house price regressions by IMF (2008) and others will end up with “*negative house price gaps*”, i.e. with “*undervalued*” houses and flats, thereby increasing affordability.

Despite the intense discussion of housing price bubbles, the different “fundamental factors”, among them, growing incomes (or reduced unemployment) and falling interest rates, contributed to the prolonged housing price upturn. These “fundamentals” will also influence house prices on their way downwards. Especially the influence of interest rates on housing prices are in focus as the short-term rates are managed by the central banks and as the low interest level is threatened by increasing inflation.<sup>9</sup>

Finally, it might be expected that lenders will have a necessary, active and negative influence on the housing prices downwards. Lenders have to take their own equity and survival into consideration. First of all, they will definitely stop “automatic cruise control” financing and tighten mortgage underwriting standards; even though they have not been announced, such policy changes must have been implemented. This may reduce housing demand and housing prices significantly.

Especially access to bridging loans has been interrupted to avoid the risk of losses on “double housing”, which leaves owner-occupiers paying for two flats or houses for a very long time. These necessary changes in loan policies have a huge influence on the markets as the demand from many households disappears while they have their first flat or house for sale. The aggregate effect is that demand decreases greatly while the supply of flats and houses for sale increases.

## **6. The development in the owner-occupiers’ debt through a downswing**

The turn around and recent fall in housing prices has occurred over the last one or two years, but owner-occupiers’ debt does not yet reflect the falling house prices as the outstanding residential mortgage lending increased in Denmark in 2008.Q2 (Danmarks Nationalbank, 2008) and in Europe (except Germany and UK) in 2008.Q1, while the net residential mortgage lending is fading out (EMF, 2008).

Therefore, the changes in owner-occupiers’ debt during a former housing price downturn might be studied to estimate the possible downturn reaction. When the last Danish housing price downturn started in 1987, owner-occupiers’ debt continued to increase and their net liability/gross income ratios reached the maxima in 1988. Through the years of the housing crisis up to 1994, the debt was reduced most for the most indebted and for the younger owner-occupiers (here, “younger” means below 50 years of age).

In Table 4 below, the net liability/income ratios for owner-occupiers (excluding the self-employed) between 30-39 years of age are shown for all years, 1987-2005. Nearly all of these younger owners and recent buyers have debt. The data in the table, like the other data presented here from the study (Lunde, 2007), have been drawn from Danish tax statistics by Lovmodelsekretariatet as a random sample of about one-thirtieth – approximately 40,000 – of all owner-occupier families within the specific year. The owner-occupier family’s *net liabilities* are equal to their liabilities (mostly mortgages and bank loans) minus their financial assets, all calculated in *market values*. The family’s *gross income* includes all family members’ incomes.

---

<sup>9</sup> The possible development in the “fundamentals” will not be further discussed here, as possible changes in these are part of general economic prognosis, which is not the subject of this article.

For each year the owner-occupiers are divided into deciles according to the size of their net liability/income ratio in Table 4. The decile values mentioned cover the upper limit for the deciles. For example, for 1996, the value 208 in the 8<sup>th</sup> decile expresses that 80% of all owner-occupiers had a ratio of 208 or below, while the net liabilities of 20% were at a value above 208 % of the family's gross income.

*Table 4.*

*Danish owner-occupiers (excluding the self-employed) between 30-39 years of age, divided into deciles by size of net liabilities as a per cent of gross income. 1987-2005.*

Year	1 <sup>st</sup> decile	2 <sup>nd</sup> decile	3 <sup>rd</sup> decile	4 <sup>th</sup> decile	5 <sup>th</sup> decile	6 <sup>th</sup> decile	7 <sup>th</sup> decile	8 <sup>th</sup> decile	9 <sup>th</sup> decile	10 <sup>th</sup> decile
1987	41	79	104	124	143	162	183	210	255	> 255
1988	43	84	110	130	150	169	191	219	267	> 267
1989	41	80	105	126	145	163	184	211	257	> 257
1990	39	80	102	120	136	153	172	197	244	> 244
1991	39	76	98	117	133	150	170	194	237	> 237
1992	49	82	103	119	135	151	168	191	226	> 226
1993	49	83	107	124	140	157	175	199	242	> 242
1994	42	78	96	112	126	141	157	176	211	> 211
1995	48	83	104	122	139	155	173	196	232	> 232
1996	45	87	111	130	148	166	186	208	245	> 245
1997	65	101	126	147	165	185	206	231	273	> 273
1998	65	107	131	152	172	192	213	240	286	> 286
1999	69	107	133	155	174	193	216	241	286	> 286
2000	69	110	138	159	179	199	219	247	293	> 293
2001	66	110	137	158	179	198	219	248	291	> 291
2002	74	117	145	167	188	209	232	259	312	> 312
2003	72	121	149	170	190	211	234	267	319	> 319
2004	80	127	155	178	201	222	248	282	342	> 342
2005	86	135	164	190	214	239	266	307	378	> 378

Source: Lunde (2007).

For the 30-39-year-old owner-occupiers, the net liability/income ratios were lowered in nearly all of the years from 1988 to 1994. Following the median values, they dropped 16% from 1988 to 1994. The size of the reduction up to 1994 varied positively with the degree of indebtedness in 1987, as the net liability/income ratios were nearly unchanged in 1987-1994 for owners in the 2<sup>nd</sup> decile, while the ratios were reduced by 20 % in the 8<sup>th</sup> and 9<sup>th</sup> deciles.

The reductions in the net liability/income ratios after 1987-88 are age dependent as the ratios fell more for owner-occupiers below 30 years of age than for the 30-39-year-old owner-occupiers and less for the 40-49 years old owners. It is remarkable that the net liability/income ratios increased in the years 1987-1994 for owner-occupiers above 60 years of age, except for the most indebted. However, these increases started from a much lower debt level; the older owners are still much less indebted than the younger owners, as seen in Table 5.

Danish owner-occupiers were more indebted than ever before when the housing prices turned around in 2006-07 as the net liability/income ratios were at an all-time high already in 2005. The median owner-occupier family had a debt (net liability), which amounted to 214% of their income in 2005. The 20% most indebted owner-occupier families in the age group had net liabilities above three times their annual income.

## **RISKS AND BAD OUTCOMES FOR OWNER-OCCUPIERS AT A DOWNTURN**

### **7. The risk situation for established owner-occupiers when housing prices move downwards**

Owner-occupiers always run the risk of a house price drop after they have invested. When housing prices have started to fall, the probability of them continuing downwards the following year might be more than 50%; only when the cycle turns around again and house prices start to increase will the house price risk be reduced considerably.

The single owner-occupier has a higher house price risk on average than owner-occupiers at the local level, and in turn, the risk at the local level is higher than at the national level due to portfolio effects resulting from inevitable changes in the housing price structure. For the single owner-occupier, the idiosyncratic risk or unsystematic risk can be rather high. A lot of different factors can contribute to this risk. In practice, owner-occupiers have no way of diversifying such idiosyncratic or unsystematic risks by creating housing portfolios. Furthermore, all owner-occupiers are exposed to the market risks that follow the changes in macroeconomic variables. And the importance for the single owner-occupier families of these factors will vary somewhat.

The size of the risk factors changes throughout the real housing price cycle and possibly, at closer examination, to a varying degree in the different segments of the housing market and in areas and regions with high cyclical variation in occupational conditions.

While established owner-occupiers lose wealth during a house price downturn, buyers gain from buying at lower prices. These distributional effects neutralize each other in the aggregate.<sup>10</sup> However, after buying, new owner-occupiers have the same house price risk as the already established owners. Only if the buyers wait to buy until the house price bottom has been reached, can they avoid the high downturn housing price risk. But of course, no one knows when the housing price bottom will be reached.

Owner-occupiers' interest rate risk as borrowers is not affected by falling housing prices. But borrowing conditions may worsen. Some lenders have increased the credit risk premium and some fees, for example, if borrowers do not make fixed payments on time. Also, owners' access to home equity mortgages is reduced because of diminished equity.

The risk position of an owner-occupier with debt is determined by his equity and liquidity. In general, a house price fall reduces the value of the house and the owner's equity by the same amount.<sup>11</sup> The owner-occupier's risk decreases with an increasing equity/housing wealth ratio. It makes no difference in relation to the owner-occupier's solvency whether the debt consists of mortgages with the house as collateral or of personal bank loans, because the legal consequences of negative equity are the same if the owner-occupier is unable to fulfil his payment obligations. A single schematic exposure of an owner-occupier family's possible economic positions is seen in Box 1.

---

<sup>10</sup> Simply, this is why capital gains and capital losses are not included in the investment concept in macroeconomics.

<sup>11</sup> For loan types such as variable interest loans and adjustable loans, the value of debt is (or is only slightly) affected. An exemption exists in the Danish mortgage system, when an increase in the market interest rate of long-term fixed interest mortgages leads to a mathematically certain reduction of the debt's market value, equal to the reduction of the market value of the opposite bonds. When the value of the house is affected downwards too, the equity is more or less maintained.

*Box 1.*

*Owner-occupiers' liquidity and solvency.*

	Positive equity / solvent	Negative equity / technically insolvent
Liquid	No problems.	No payment problems; capital payments ensure future improvement of solvency.
Illiquid	Raise a loan	Financial reconstruction (where lenders reduce the debt size). Otherwise foreclosure.

Owner-occupiers who are *liquid* and have *positive equity* are for the most part unaffected by a housing price downturn. They can remain in the house or sell it. Their capital loss is equal to the reduction of the net present value of the future user costs of their home. If they sell, they can buy an “identical” house at the same value.

Owner-occupiers who are *liquid* and have *negative equity* do not face “problems” unless they become illiquid for some reason. The frequency of this combination may depend on market customs and lenders’ risk aversion. The “normal” way of financing a house purchase in Denmark is that the buying price can be nearly fully financed with loans: a mortgage up to the legal maximum loan-to-value ratio of 80% and a commercial bank loan for the rest; the house will be taken as collateral for both loans. Since many households already have some debt before buying a house or taking out new loans to finance a modernization of the house or to purchase furniture, a car or other items, they can easily have negative equity after the buying.

Owner-occupiers, who are *illiquid* and have *positive equity*, have some access to refinance loans with longer terms or softer payment profiles, or they can postpone the problem with a new loan. Possibly, their lack of liquidity may have been created by loss of income for some reason.

Of course, all owners run the risk that continued house price drops will end up as negative equity. Negative equity can easily be increased and positive equity can easily become negative because of the indebted owners’ difficulties in repaying and prepaying loans in line with the house price deflation.

Owner-occupiers who are *illiquid* and have *negative equity* are in a situation their lenders cannot accept. The possible solutions are a foreclosure or some form of voluntary agreements to reach one of several possible solutions: a) voluntary sale, b) restructuring debt (with loan conditions not offered in general), c) the lender reducing the household’s debt. In the last two cases, the family can remain in their home. In Denmark, foreclosures are an uncommon solution when housing prices are increasing and situations with combined payment and negative equity problems can be voluntarily solved. Possibly, the household involved may make a voluntary sale with the lenders agreeing to continue with uncovered loans. During periods with falling house prices, foreclosure solutions may flourish.

**8. Arrears, repossession, and foreclosures.**

For lenders, the qualities of properties as collateral vary positively with the severity of the legal access to take the properties into possession when owners and borrowers do not pay on the

determined days. The more severe the rules are, the more valuable are the collaterals for lenders, and the higher the discounts for the collateral option in the borrowers' interest rates accepted on the market.

The procedures and rules differ greatly among the countries studied; possibly the rules have not been changed since the last housing crises in the beginning of the 1990s. In the most market oriented systems, general bankruptcy and foreclosure rules are applied to housing in the same way as to other assets. In other countries, housing is still regarded as "special", as the home for the family, which makes the foreclosure process complicated, expensive and prolonged if at all possible, (Whitehead, 1996).

An example of important differences in foreclosure rules is that in the U.S., the UK and some other countries, a household is free of any former mortgage debt after a foreclosure, but "*because foreclosures impose high costs, ..., both the borrower and the lender often are better off avoiding foreclosure*" (Bernanke, 2008). In contrast, in Denmark, the household still has a debt after the foreclosure, which is equal to the part of the former mortgage debt not covered by the price at the foreclosure auction; in addition, the costs of the foreclosure are included in the debt.

The real drawback is encountered when the borrower gets into payment troubles and is seriously increased during a housing price downturn when the frequency of households with negative equity and illiquidity problems is much higher. Often a household has experienced an unexpected loss of income in connection with unemployment, sickness, death, divorce etc. When an owner-occupier family tries to solve such difficulties in a downward housing market by selling, it may be difficult to find a buyer. Often mortgage and commercial banks refuse to yield the necessary new loans for debt restructuring or to finance the family's purchase of another house with a "negative down payment". Consequently, financially stressed households may resort to consumer credit or loans on the "grey" market with high interest rates. For the most part, this aggravates liquidity problems and still more households simply stop paying and are registered as being in arrears. In this stressed and failing housing market, many families will get into payment troubles and many foreclosures occur.

Therefore, with some time lag after the housing price downturn has started, the frequency of arrears increases too. Many borrowers in arrears will not be able to manage increasing debt services. Repossession or foreclosure will be the result. Therefore, some time lag will exist between the increase in arrears and in foreclosures.

Meen (2006) argued that natural rates of housing repossessions are higher (in UK) now than in the seventies and early eighties. Furthermore, Meen estimated that "*the low levels of interest rates of recent years by historical standards have been a key factor in explaining the current low level of possessions*" and "*that high rates of increase of house prices reduce possessions significantly*" (Meen, 2006, p.26).

The maximum values for the number and frequency of foreclosures might be of interest too. In a speech in May 2008, Ben S. Bernanke said that "*About one quarter of subprime adjustable-rate mortgages are currently 90 days or more delinquent or in foreclosure.*" And as delinquency rates also had increased in the prime and near-prime segments, a consequence was that "*foreclosure proceedings were initiated on some 1.5 million U.S. homes during 2007, up to 53 percent from 2006, and the rate of foreclosure starts looks likely to be higher in 2008.*" Seriously, "*the fourth*

quarter of 2007, the rate of serious delinquency,..., stood at 2 percent of all mortgage borrowers.” (Bernanke, 2008).

In 1980-1984 and 1987-1993, mass foreclosures hit Denmark. In the years 1980-2000, a total of 152,523 foreclosures on owner-occupied houses and flats were announced, accounting for 13 % of the 1999 stock. Most of the foreclosures announced went through. Especially owner-occupied flats were hit, the number of foreclosures being close to 33 % of the 1999 stock.

### 9. The most indebted – the most risky owner-occupiers – risk indicators.

Financial gearing determines the risk for negative equity for owner-occupiers and can be measured through net liability/housing wealth ratios. Negative equity is a necessary condition but in addition, the household must have payment troubles to actually risk foreclosure.

Due to housing price increases and repayment of loans, after financing the purchase of a house or flat, a household’s leverage ratio will decrease with the length of ownership. Because of the normal family lifecycle, most persons and families enter owner-occupation at a fairly young age, in Denmark, usually before age 40. Therefore, households’ leverage is negatively correlated with age and it is often argued that young families are the most indebted. Of course, the time of purchase and the number of years after determine the risk, not age in itself; age is only a proxy variable. After the purchase, when a household makes equity withdrawals, its leverage is increased again, but most leverage far from matches the ratios at the purchase.

The variation by age for Danish owner-occupiers in their net liability/housing wealth ratios in 2005 is shown in Table 5. The publicly assessed property values have been used as estimates for the market value of the house or flat and as these assessed values were about 18% below the market values on average, the results in Table 5 over-estimate the indebtedness. This is partly counteracted by the fact that the transaction costs of selling a flat or house amount to 7-8% of the value is not included. Half of the youngest owner-occupier families had negative equity in this sense, but the ratios fall with age. In the oldest age groups, many families have positive savings besides the value of the house in their portfolio, partly due to withdrawal of institutional pension savings.<sup>12</sup>

Table 5.

*Owner-occupiers (excluding the self-employed), divided into deciles by size of net liabilities as a per cent of housing wealth, by age. 2005.*

Age – years	1 <sup>st</sup> decile	2 <sup>nd</sup> decile	3 <sup>rd</sup> decile	4 <sup>th</sup> decile	5 <sup>th</sup> decile	6 <sup>th</sup> decile	7 <sup>th</sup> decile	8 <sup>th</sup> decile	9 <sup>th</sup> decile	10 <sup>th</sup> decile
< 30	44	66	80	91	101	110	121	135	158	>158
30-39	37	59	71	81	91	100	111	125	148	>148
40-49	10	35	49	62	73	83	95	112	135	>135
50-59	-23	4	22	35	47	60	73	89	112	>112
60-69	-61	-28	-11	2	15	28	41	56	80	>80
> 70	-115	-65	-39	-24	-12	-3	7	21	43	>43
All	-40	-8	13	32	49	65	81	98	123	>123

Source: Lunde (2007).

A recent OECD paper showed that the household leverage ratios for 15 OECD countries in the period 1995-2005 remained unchanged or increased somewhat in the countries included (Girouard

<sup>12</sup> Institutional savings for pension purposes are not included in the families’ assets in the study.

et al., 2007), i.e. the owner-occupiers' debt had at least risen in line with the increase in house prices and other asset values. Also, Girouard et al. (2007) present few distributional or micro-level data on the household debt-to-income ratios, which are at the maximum for the 35-44 years old owners and then decrease with age, but such data are rather limited.

## THE FINANCIAL INSTITUTIONS

### 10. Lenders' risk.

Lenders run a credit risk when lending to owner-occupiers, but the risk is lower than on ordinary loans. By using the property as collateral, the lender's loss potential is greatly reduced on a mortgage, because only part of the outstanding debt will be lost in case of a forced sale or a foreclosure. Lenders' credit risks are higher on loans with commercial and industrial properties as collaterals than for owner-occupiers, but the risks are even higher when financing building projects. The credit risks of secured loans with properties as collaterals are much increased when property prices are falling.

Perhaps the comfortable collateral security lies behind the lenders' behavior, at least in Denmark, during a time of increasing housing prices, when they very often accept the purchase of a house or flat with a very low down payment if the borrower has the necessary income to pay the debt service on the loans and the housing expenditures. In this case, the owner-occupier has no equity buffer if housing prices start to fall.

The owner-occupier's own house price risk contains idiosyncratic and market risk elements and depends on his leverage. The lender bears part of this risk, but by having a portfolio of owner-occupiers as borrowers, the lender has reduced the average risk. One of the basic ideas of a portfolio is that the average loss will more or less be realized year after year.

However, the losses will primarily appear during housing price downturns, which hit the whole property market more or less. In this situation, the lenders have losses on many loans in the portfolio at the same time. Moreover, several years with falling house prices follow each other and the single year's losses are accumulated to threaten the lender's equity. A feature of many financial crises is that more aggressive banks make bad credit valuations and accept credit risks that are too high. The consequences of such behaviour are realized during housing market downturns and general recessions.

The risk of falling housing and other real estate prices represents the lenders' market or correlation risk, which Shiller formulated as "*the trickiest problem these rating agencies face in assessing these securities, ..., is correlations risk (the risk that many of the real-estate-backed assets will default at the same time), ...*" (Shiller, 2007, p. 6).

Davis gives an overview of special risks at bank lending to finance real estate and finds "*real-estate lending as a major source of banking difficulties, and indirectly of financial fragility for the wider economy*". Moreover, the instability in the market is aggregated by the behaviour of lenders, who "*may find real-estate lending per se attractive for a number of reasons...*". The issue of collateral gives the lender higher security and makes it possible to reduce the interest rates on the loans; the borrower pays for this reduction by selling an option to give up the family's home (potentially after a foreclosure) if he or she cannot pay the debt services on the loan. But the lenders seem to overlook that "*unlike other loans, the cash flow to repay a property loan is not independent of the collateral,*

*with changes in vacancy rates or rental values being immediately reflected in the resale value of the building. Also collateral for property loans is highly specific and potentially illiquid.”* Banks’ and other lenders’ desire to grow relatively fast can be generated by issuing mortgages, which are relatively big loans. As Davis remarks, these efforts are fuelled by the fact that “*property loans generate sizeable front-end fees that boost profits immediately*”. (Davis 1995, Chap. 10).

### **11. The lenders’ reaction to falling housing prices – the credit crunch.**

The lending financial institutions are forced to take the necessary steps when they begin to experience losses on loans – or better yet, well in advance. Strong reactions are necessary when institutions experience big losses that may threaten their equity and survival as independent banks.

In the U.S., the very serious subprime crisis consists of both a housing market crisis and a credit crisis. Both of these seem to have been strong enough to result in ongoing backlash in the U.S. economy. Banking problems have appeared in some other countries too, but to a less severe degree. Unfortunately, these problems only have to be mentioned here as the theme would demand separate analysis.

As well-known consequences of the much higher risk in the short-term money and interbank markets, credit spreads have increased considerably in these markets; this has been the case for more than a year. When the lenders have to pay these higher credit spreads, they are passed on to the borrower in the form of increased interest rates. Due to the higher risk encountered when lending to owner-occupiers, lenders increase the risk premiums on interest rates both for new loans and for existing loans when interest adjustments are made. For borrowers with payment troubles, the risk premiums in the interest rates are more than aggravated. The increased risk premium more than counterbalances the central banks’ interest rate reduction.

The “weak” restriction of lenders not agreeing to yield bridging loans to borrowers with “double housing” has already had a strong influence on the housing market as families no longer demand other loans to act as suppliers of their existing ownership. This change will have a huge depressing influence on the market until a new equilibrium situation is reached in a number of years.

Of course, lenders have also tightened their credit policies and their credit valuations greatly with the obvious result that they agree to less lending. This may have reduced the housing demand further.

The credit crunch has become a reality in several countries and seems to be worsening. This is poison for housing markets. It will aggravate the owner-occupiers’ situation when they have payment troubles and negative equity. At the same time, the mechanisms working behind the falling house prices are being stimulated.

### **12. Housing crises and financial crises**

A large number of financial sector activities are related to properties. A collapse of the housing market can lead to large credit losses for financial institutions, which is why a real estate or housing crisis would threaten financial stability in the financial sector and in the macro-economy as a whole.



The variability of housing prices as well as the mortgage systems and other credit for properties contains several structural features which may lead to housing and financial crises. One important group of features comprises the many special characteristics of real estate, including the heterogeneity of property as a good, the dual character of housing as an investment and a consumption good, the high transaction costs and, not least, the unique and unchangeable location of each property unit. In addition, in countries with mortgage systems, long-term investments in housing are often highly geared. Davis (1995, pp. 296-299).

In 18 of the 26 banking crises they studied, Kaminsky and Reinhart found that the financial sector had been liberalized a few years before. Their result “suggests that ...crises may have common origins in the deregulation of the financial system and the boom-bust cycles and asset bubbles that, all too often, accompany financial liberalization.” (Kaminsky and Reinhart, 1999, p. 480).

A financial crisis may have its roots in a property crisis, during which credit risks in banks have increased, as the values of the collaterals behind the loans are weakened because of falling house prices. For banks, credit risk is a normal and perhaps the most common cause of banking failures. Increased losses reduce the banks’ willingness to increase lending and this in turn can lead to credit crunch, as otherwise profitable projects are precluded. “Often, the banking problems do not arise from the liability side, but from a protracted deterioration in asset quality, be it from a collapse in real-estate prices or increased bankruptcies in the nonfinancial sector.” (Kaminsky and Reinhart, 1999, p. 476). Housing crises and banking crises “are correlated in a remarkable number of instances” (Herring and Wachter, 2003, p. 217).

Many examples exist of combined housing and financial crises and “...the run-up in U.S. equity and housing prices that Graciela L. Kaminsky and Carmen M. Reinhart (1999) find to be the best leading indicator of crisis in countries experiencing large capital inflows closely tracks the average of the previous eighteen post World War II banking crises in industrial countries.” (Reinhart and Rogoff, 2008, p. 2). Davis studied the experiences of the late 1980s and early 1990s and found that the period’s financial fragility was – partly – due to lax monetary policy, deregulation of loans for house purchases, willingness of banks to offer lending to (or secured by) properties and macroeconomic effects of property prices (Davis, 1995, Chap. 9). Among the latest combined crises is the Scandinavian Banking Crisis in Finland, Sweden and Norway, which arose as a result of steeply rising housing prices that subsequently collapsed, financial liberalization and credit expansion, as mentioned briefly by Allen and Gale (2007, p. 14). To some extent, Denmark was part of this crisis even though the Danish state did not take over any banks.<sup>13</sup> One more reason for the Scandinavian Banking Crisis was the tax reforms in each of the countries, which reduced the tax value of the right to deduct interest expenditures, thereby contributing to the reduction of house and flat prices (Økonomiministeriet, 1994, p. 72).

The ongoing subprime crisis in the U.S. started at the beginning of 2007. At the end of August 2007, Mishkin wrote for a FED seminar: “exceptionally unfavourable conditions in the housing sector have the potential to create instability in the financial system – instability that could magnify problems for the overall economy.” And “Although I generally do not place the housing and mortgage markets close to the epicentre of previous cases of financial instability, I would note that the current situation in the U.S. could prove to be different..” He concludes that “as events

---

<sup>13</sup> In August 2008, the Danish central bank took the 8<sup>th</sup> largest bank into possession. The dominant cause was losses on lending to commercial properties and construction.

*illustrate, under certain conditions the housing sector can be a source of financial instability.”* (Mishkin, 2007, pp. 381-387).

## **HOUSING MARKET EFFECTS**

### **13. The housing market effect in the short run.**

Housing market cycles have now reached the phase where demand has weakened and building busts will minimize the supply of new built units and modernizations. In the short run, therefore, the housing stock is given and produces a fixed supply of housing services per time unit. Therefore, the weakened housing demand cannot result in a quantitatively lower housing consumption. Properties have a long duration and, in the short run, the population in a country cannot reduce housing consumption in a quantitative sense. Moreover, housing services cannot be stored.

Housing is special, due to the long life of the single house and its immobile characteristics. In addition, housing combines a stock market: owner-occupation and a flow market: rental housing. Nearly all countries have at least these two tenures. Here, the balance between the two tenures is fixed, an assumption that will be relaxed below.

Whatever happens, most households continue to live in the flat or house they are already have as their home, which is why quantitatively their housing demand and housing consumption is unchanged. The falling house prices have reduced the value of these owners' houses and their opportunity housing costs; therefore, the reduction of their housing wealth is equal to the reduction of the net present value of the future user costs in their house; these changes represent an equal reduction of the owner's assets and liabilities.

It might be credible that falling house prices by themselves lower the demand for housing of some households. Some households postpone trading up to a better dwelling while others postpone trading down to a smaller dwelling because they do not wish to realize a capital loss (compared to the recently high price level). As always, a certain minimum supply will exist because some households are “forced” to leave due to divorce, employment in another region, sickness, or death. And some households may be unable to change their housing position, because negative equity means they are unable to sell their flat or house. It might be credible that the net effect is reduced housing demand when housing prices are falling. However, in the short run and in the aggregate, the stock of housing is unchanged and the quantity of housing services produced and consumed cannot be changed. Therefore, quantitatively, the reduction of some households' housing demand must be leveled out by the increase in some other households' housing demand. When the net effect is that falling housing prices reduces housing demand, the downward pressure on housing prices might be aggravated.

In equilibrium, all housing services are used for the single period. In practice, empty flats and houses are found as a misallocation at the market. An unused flat or house gives the owner a loss. The obvious reason that some houses and flats are unsold and empty in the current market is: *“First, demand drops...as buyers stop looking and stop making offers. Sellers, on the other hand, hold out at the “sticky prices”.*” (Case & Quigley, 2008, p. 165). However, a lot of reasonable explanations are operating: the time spent on moving and modernization after a sale, unsold “former” homes, regional mobility, divorce, moving to a nursing home or hospital, or death. Some families with negative equity have simply abandoned their home, or a foreclosure is going on.

When the short run assumption is slightly removed, the supply of newly built flats and houses for sale has to be included. This finalizes the preceding building booms. Often these units are relatively expensive, because they have been built during boom years with some inefficiencies in production and high production costs, and in the aftermath busts, some of the owner-developers are on the edge of a bankruptcy and have to keep bid prices nearly unchanged.

Also, the assumption that the balance between rental and owner-occupation tenures is fixed has to be lifted. Individuals and families may find it better to rent than to own for some period or permanently because they feel that the house price risk of owning is too high for the moment or that renting is cheaper.<sup>14</sup> Furthermore, many sellers might have found that becoming a landlord is a better option than trying to sell in a market with many empty flats or houses for sale. In this case, the seller's direct expenditures are covered by the rent. In the aggregate, the increase in the number of rental housing units equals the increase in the number of renting households. Therefore, the change does not directly affect the function of the owner-occupation market but may have an indirect positive influence as fewer units are offered for sale.

#### **14. The housing market cycle and housing consumption.**

Housing market cycles last on average around 10 years, with an upturn at 5½ years and a downturn at 4½ years, but of course the length varies considerably (see Table 1). Therefore, the assumption of a given housing stock can be removed and the analysis can be made dynamic by including the building sectors' responses to upturns and downturns.

Housing cycles have a strong impact on the wider economy, as Laemer indicated in the title of his recent paper: *"Housing is the Business Cycle"*. He argued that *"Housing is the most important sector in our economic recessions, and any attempt to control the business cycle needs to focus especially on residential investment. But housing presents a special control problem because monetary policy affects mostly the timing of the building but not the total building."* (Laemer, 2007, p. 150).

Furthermore, the building sector activity covers on average a certain part of the production in an economy, but does not contribute to the general economic development because building does not expand more than production in other sectors. This indicates that in the long run, consumption of housing does not increase more than consumption of non-housing goods. This is reflected in Laemer's conclusion: *"For long-run growth, residential investment is pretty inconsequential, but for the wiggles we call recessions and recoveries, residential investment is very, very important."* (Laemer, 2007, p. 158)

Housing cycles may also have an impact on the housing market itself, which would make analyses of individual upturns or downturns unsatisfying. Following Laemer's result that for long-run growth, residential investment is pretty inconsequential, the housing stock forms a stable housing wealth-to-GDP ratio in the long run. Moreover, this indicates that the long run relation between housing and non-housing consumption is stable too. This explanation seems very plausible. Structurally, housing or a non-housing consumption good can capture a higher part of households' total consumption, for example, because of the good's luxury features and economic growth. But an ordinary economic argument must be that, permanently, the use of housing (or of any other

---

<sup>14</sup> Also, the house price/rent ratios are abnormally high around the maxima in real housing price cycles, as has been seen recently.

consumption good) cannot increase more than total consumption. If the opposite were the case, housing would fill up the whole consumption basket. Housing is not a cuckoo in the nest!

Therefore, when the analysis of housing demand during a housing downturn is expanded to follow the whole housing cycle, the first statement might be that over the whole cycle, the level of total housing consumption (in real terms) is unaffected. The second statement is that the level of housing consumption might be the same after a housing cycle has run its course, regardless of whether the cycle has been very volatile or smooth. These plausible arguments suggest that the weak housing demand fostered by a housing price downturn and the downturn's continued negative influence on housing demand might be outweighed by the strong increase in housing demand behind the housing price upturn and this upturn's fostering of an extra increase in housing demand. An even further reaching hypothesis is that the size of the house price volatility over the housing cycle does not influence the final housing consumption result.

An attempt at an explanation is made by following the housing market through an upturn and a downturn. The strength of a demand-driven upturn may determine the size of the housing price increase in the short run when the supply of housing services is fixed. Further, the size of recent and of expected house price increases will determine the incentive to build more flats and houses and to modernize existing units. Through this activity, the supply of housing increases and gradually contributes to dampening the housing price rise. Following the common assumption of mean reversion, housing prices will be drawn away from the high level and down against a long-run equilibrium price level. A shock or some other trigger could also start to work against the upturn. In this phase, housing consumption becomes somewhat higher than it would have been if the housing market had been stable but nonetheless the increase has been quantitatively less pronounced.

When the cycle starts to turn around at the housing price maxima, housing demand weakens and housing prices start to fall. A tempting hypothesis is that the higher the maxima price level and the more the housing stock has been increased because of additions of new (or modernized) units, the deeper the housing prices could fall during the downturn. In this phase, the housing stock continues to increase because of the time lag in the building processes.

At the start of the housing market downturn it is impossible (quantitatively) to reduce the housing stock and therefore, prices must take the total adjustments. The higher the addition to the housing stock through the subsequent upturn years, the higher the housing stock quantity is during the downturn, and the more and deeper housing prices can fall before they match the size of the housing stock and the later the downturn finishes. In this phase, many families have to postpone improvements of their housing demand, because they do not have the necessary economic resources and/or access to the necessary credit.

The housing cycle's more or less absent influence on long-run housing consumption only works in the aggregate and for the whole cycle. Strong distributional effects remain and create winners and losers on the housing market. The causes can be compressed to the fact that individuals' and families' life cycles do not follow the housing market cycles, and further, their life cycles and personal economic cycles are not identical.

Therefore, a family does not necessary fulfill the conditions that make them ready to enter the more permanent housing form of owner-occupation in the phase when the housing market is most favorable to enter. They need sufficient income to pay for housing (of any type) and to receive a

positive credit valuation to buy their first owner-occupied flat or house and later on, if the family wants to trade up, they must have a higher income and/or greater savings to secure the equity for the next step. They run the risk of losing income for several possible reasons.

The family's equity does not only depend on their down payment but also on the house price changes after their purchase. Moreover, they have the payment risk and/or risk on the debt size on their mortgages. Therefore, strong distributional risks are released and enlarged over the housing market. The idea of smoothing housing prices cycles as often proposed<sup>15</sup> would certainly have positive distributional effects, but the practical barriers to reaching the target are high.

### **15. The construction activity recession**

Over the many years with steeply rising housing prices, the construction sectors in many countries have responded to the increasing profitability and increased capacity and have built new, or modernized and renovated, flats and houses. This has in several countries "*brought forth an increase in supply, especially in Ireland and Spain, leading to a construction boom that to some extent has generated its own economic momentum.*" (Hoeller and Rae, 2007, p. 8).

Hoeller and Rae have analysed 49 residential construction booms between 1960 and 2004 in 23 countries for which data was available, omitting the recent peaks. They found that the average increase in per capita residential investment from trough to peak is around 40%. More frightening was their observation that "soft landings" are not especially common; in fact, they identified "*only four cases where the declines in per capita residential investment have been smaller than one third of the increase that occurred during the boom years*" (Hoeller and Rae, 2007, p. 13).

After the turnaround in housing prices 2006-2007, construction busts have appeared in the U.S., Spain, Ireland, and Denmark and in several other countries. Some of the busts look rather strong.

Normally there is a sort of minimum construction activity, because some building projects are not only driven by profitability. Public construction activities, including social housing like that found in Denmark, are made independent of the cycles or are used to smooth the activity level during the building cycle. Also, for technical reasons, some maintenance can be necessary, independent of the cycles, while renovations and modernizations of existing properties mainly follow the housing cycles.

The changes in housing prices have a substantial effect on the residential building activity and therefore on the cycles in the construction sector. The more the prices for existing houses have increased up above the prices for newly built identical houses, the more profitable is the construction activity. The presence of the Tobin Q relationship seems documented through the recent construction booms and busts.

As the cycles in the construction sector are strong, adjustments of the capacity in the sector up and down in accordance with booms and busts imply obvious difficulties. The booms in construction in several countries might have triggered the traditional structural problems in the construction sector: low productivity growth and weak competitiveness. This may have reduced the yield of the invested

---

<sup>15</sup> Laemer includes such tasks on his "*personal monetary policy to-do list*". (2007, p. 210)

capital in an upturn, which otherwise gave very comfortable earning possibilities. Of course, when a downturn is steep, the income loss in the sector during subsequent years may be high.

Laemer studied residential investment cycles and their importance for the economy in the U.S. as a whole. He found that *“Eight of the ten recessions were preceded by sustained and substantial problems in housing and there was a minor problem in housing prior to the 2001 recession. The one clear exception was the 1953 recession, which commenced without problems from housing.”* (Laemer, 2007, p. 164).

He also found that residential investment contributes most to the weakness in the overall economy before recessions: *“Thus residential investment is subtracting from GDP growth before the recession but starts to contribute more than normal in the second or third quarter of the recessions”* (Laemer, 2007, p. 164), while residential investment contributes to the following recovery: *“In other words, residential investment consistently and substantially contributes to weakness before the recessions, ... And the recovery for residences begins earlier and is complete earlier”* than for other areas (Laemer, 2007, p. 164)

The value of the newly built properties<sup>16</sup> contributes to macroeconomic production and investments and has a high impact on the wider economy. In the U.S., the recent declines in *“residential investment was removing almost 1% from the normal GDP growth of 3%.”* (Laemer, 2007, p. 164) and Mishkin (2008) has presented a similar estimate for 2007.

Case & Quigley estimated for three earlier downturns in residential investments and housing starts as well as the most recent that residential investments as a percentage of GDP dropped from around 5.5% to 3.5% and concluded that *“the decline in housing starts which was observed in the first half of 2007 reduced the GDP growth rate in 2007 about 2 per cent.”* (Case & Quigley, 2008, p. 174).

However, during the housing market upturn, residential investments made similar strong additions to economic growth.

## **16. The real estate industry recession**

Turnover for the real estate industry follows the cycles of residential and commercial property sales. When a demand-driven housing and property market downturn occurs, both the property prices and the number of sold properties fall. Housing market cycles are more or less copied in the real estate industry.<sup>17</sup> The activities inside the industry are organized differently in different countries and the single functions can be separated or maintained by one or several professions; therefore, not only real estate agents but also brokers, appraisers, land inspectors, building inspectors, lawyers, and possibly other professions may be involved in the real estate industry.

When the housing market is in a downturn, firms and real estate industry employees experience a direct loss of income, as underlined by Case & Quigley (2008, p. 162). Most incomes in the sector come from fees, which vary with the value or number of houses sold. Therefore, the fees are reduced because of both fewer sales and lower prices for the properties sold. Moreover, the houses are offered for sale for a longer period and are more difficult to sell, and agents therefore have to do

---

<sup>16</sup> Exclusive the land values, which only have been transferred from the owners of the plots to the property owners.

<sup>17</sup> Not only the construction sector, as mentioned, but also other industries and professions follow housing market cycles more or less; for example, furniture removers, furniture production and sale, and many durable goods.

more to get sales through. Compensating for the extra work by higher fee percentages is difficult since the competitive industry has redundant capacity in a downturn. However, as the real estate business is highly involved in forced sales and foreclosures, some compensatory income is received.

In total, the net effects are a loss of income for the real estate industry and a reduction in the capacity, number of firms, and number of employed in the industry.

Clearly, this is a part of the aggregate reduction of income and employment in the economy during a housing market downturn.

## **THE WEALTH EFFECT ON CONSUMPTION**

### **17. The wealth effect: will falling house prices lower private consumption?**

The housing market is of central concern for the wider economy. The wealth effect covers the possible influence of house prices on consumption in the aggregate and for single families and groups. By intuition, people think that owner-occupiers' capital losses as result of falling house prices will have a major negative effect on consumption, just as intuition told them in the years with steeply rising house prices that the capital gains permitted the owners to consume more. The outcome of the wealth effect for a longer period with falling housing prices and its influence on economic activity is analysed below.

Especially owner-occupiers with negative equity and serious payment troubles will be forced to reduce non-housing consumption, often rather drastically if they want to avoid a foreclosure. These financially stressed owners have to repay their loans and are often refused new loans or can, at best, only get short loans with a high risk premium on the interest rate.

The economic resources at a family's disposal during a period comprise the income for the period and the wealth at the start. Any increase in the family's wealth, whether from properties, stocks, bonds, or other assets, adds to the household's consumption possibilities. This is the simple wealth effect. Also, the effect is found as part of "the monetary transmission mechanism" and as "the collateral channel" as housing provides collateral for mortgages and households' spending decisions. However, further aspects have to be included in the wealth effect. Every family may worry about where they are living at the end of the period. If they are living in the same owner-occupied house, the value of their future housing consumption, measured at the net present value of future user costs, must have fallen as much as the value of the house. If they are moving to an "identical" house, its buying price – its market value – must have fallen just as much.

Recent years' economic research describing the complex links between house prices and (the aggregate) consumption has led to a huge body of academic literature and has shifted the theoretical debate from more positive to more sceptical interpretations of theories. This is illustrated by the way Aron et al. begin their paper: "*There is a widespread disagreement about the role of housing wealth in explaining consumption.*" (Aron, Muellbauer and Murphy, 2007), see also (Mishkin, 2007) and (Muellbauer, 2007).

Research contributions on the wealth effect of falling house prices are limited, perhaps partly because house prices started to fall recently, but worth mentioning are the contributions presented at Federal Reserve Bank of Kansas City's Jackson Hole Symposium on "*Housing, Housing Finance, and Monetary Policy*" (2007), and Case and Quigley (2008).

A treatment of the housing wealth effect should include the fact that the possibilities for non-housing consumption depend on the different agents' situations as their effects can neutralize each others', influence liquidity directly and work indirectly through the marginal propensity to consume. Some effects work via the capital market, i.e. via borrowers and investors.

In summary, the discussion below of the influence of falling housing prices on consumption shows that

- financially stressed owner-occupiers who lack liquidity and have negative equity may have their non-housing consumption severely reduced, but to a lesser extent in the long run,
- other owners with good equity have no incentive to reduce non-housing consumption,
- buyers can consume more non-housing goods in the short and long run,
- these effects neutralize each other in the aggregate at the macro level, and at least in the long run,
- the marginal propensity to consume is temporarily lowered by falling house prices.

Each property sale involves a buyer and a seller. Each loan is an agreement between a borrower and an investor. These banalities determine whether a housing wealth effect on consumption exists in the aggregate. Moreover, housing is an asset on the single owner-occupier's balance sheet and the net present value of the future user costs is a liability in his accounts. The stock of houses and flats are fixed in the short run and when all the effects of changing house prices on non-housing consumption possibilities are aggregated, the effects outbalance each other.

An obvious example of effects of falling house prices that neutralize each other in the aggregate is a seller of a flat who trades down to a cheaper flat, realizes the now smaller price difference, and can use it for non-housing consumption. The buyer trades up from a cheaper to a more expensive flat. (This is the net effect, even though there may be a long moving chain in between). The buyer pays the smaller difference between the buying price and his selling price, why his non-housing consumption possibilities are reduced less. Therefore, the changes in the non-housing consumption will balance out at the transaction. When house and flat prices have dropped, in equal proportions, the seller's capital loss equals the buyer's gain and they have equal changes in non-housing consumption possibilities – with opposite signs.

Another example is an owner-occupier who remains in his house after a house price fall: When the value of his house has fallen and his equity had fallen to the same degree, he can withdraw a smaller amount through a home equity mortgage. The owner – and borrower – has reduced his possible consumption. The investor has reduced his lending and thereby increased his consumption possibilities with an identical amount.<sup>18</sup>

In an influential paper, Case, Quigley and Shiller found a statistically significant and rather large effect of housing wealth upon household consumption and noted that housing market wealth has a more important effect on consumption than financial wealth (Case et al., 2005). Now, Case and Quigley add that *“this suggests that the buoyancy of the housing market after the turndown in world stock markets in 2000-2003 helped avert a recession in the developed world.”* (2008, p. 163).

---

<sup>18</sup> Miles strongly demonstrated these balancing-out effects in his analysis of the influence of housing on the wider economy (Miles, 1994).



Moreover, Case and Quigley argue that the slowdown in the U.S. housing market since 2006 will probably not be manifest as a direct reduction in consumer spending through the wealth effect. *“There are two reasons why the current slowdown in the housing market by itself is not likely to lead directly to significantly reduced household consumption through the wealth effect (although if the combined effects of all the factors ... leads to a recession, that would, of course, lead to a drop in consumer spending.)”* The first reason is the asymmetric response of consumption to changes in housing wealth as shown by the analysis in Case et al. (2005), where *“the estimated effect of decreases in household wealth upon consumption is uniformly small and is insignificantly different from zero in all specification.”* The second and perhaps more important reason arises *“from the price-equilibrating process in the housing market – namely the downward stickiness of prices.”* They estimate the wealth effect of the house price decline to be less than 1 % of GDP given a house price decline of 15 % (Case and Quigley, 2008, p. 164 + 168).

In general, the wealth effect of (increasing) housing price changes has been challenged seriously, theoretically and empirically. Here, we might contribute to that scepticism, also in case of falling house prices. One obvious problem is that the correlation between housing prices and consumption is not causal. Still, falling house prices have a major negative impact on economic activity – but to a smaller degree through the wealth effect. In a discussion of the existence of a housing wealth effect, Ludvigson argues that *“the house prices may be correlated with consumer spending because of a common macroeconomic factor (for example, income expectations) that affects both housing and consumption at the same time,”* (Ludvigson, 2007, p. 2).

Most recently, the critique of the different correlation studies has been rather direct from Aron et al. (2007), who argue on the basis of a selected survey of the more well-known studies of consumption and asset prices *“that much of the empirical literature is marred by poor controls for the common drivers both of house prices and consumption, including income, income growth expectations, interest rates, credit supply conditions, other assets and indicators of income uncertainty (such as changes in the unemployment rate).”* They find *“the econometrics is questionable”* and try to make a model *“incorporating more complete control than is generally employed in the literature”*. They find that *“credit market liberalization increases the average propensity to consume out of income [in UK and South Africa] and its inclusion brings clear benefits in finding better determined negative real interest rate effects on consumption.”* Also the role of expected income growth is increased in the analysis. Muellbauer repeated the critique at the Fed’s Jackson Hole Symposium, observing that *“housing equity withdrawal has no explanatory power in our extended consumption function.”* (Muellbauer, 2007).

The most indebted half of young owner-occupiers up to around 50 years of age must have been forced to save during the latest Danish housing crisis 1987-1993, because their net liability/income ratios were reduced considerably, as seen for the 30-39-year-old owner-occupiers in Table 4. In general, they must have repaid former loans in accordance with the ordinary payment profile, they could not have obtained new loans and they possibly prepaid some debt too. The net liability/housing wealth ratios for the younger owner-occupiers were nearly stable throughout the period (Lunde, 2007) as they reduced their debt to a degree similar to the fall in house prices. The reductions were in general stronger the younger the owner-occupiers were, of course, since younger owner-occupiers had bought more recently and at very high loan-to-values.

New owners had bought at even lower prices during the period, which is why the necessary loans to finance the buying were lower too. Foreclosures were common in these years, and when a highly

indebted owner-occupier finally came through a foreclosure, he left by definition the group. Clearly, these effects must have reduced the net liability/income ratios and may have limited the negative influence on the possible non-housing consumption

However, the half of the young owner-occupiers with the lowest net liability/income ratios preserved their ratios and therefore, their possibilities for non-housing consumption remained unchanged throughout the last housing crisis (see Table 4). Owner-occupiers above 60 years of age and tenants (of all ages) even increased their ratios a little (Lunde, 2008), and could therefore increase their non-housing consumption during the housing crisis period.

Younger owner-occupiers' net interest expenditure/income ratios fell significantly from 1987 and up to 1994, mostly because their net liability/income ratios were reduced. Even though the tax rate for deducting interest expenditures was reduced as part of the tax reform in 1987, Danish owner-occupiers improved their liquidity for non-housing consumption slightly from 1987 and up to 1994 (Lunde, 2007).<sup>19</sup>

Once again, housing prices are falling seriously, and once again, it might be expected that highly indebted owner-occupiers, in, for example, Denmark, may have to repay debt in accordance with the original loan conditions and have no access to obtain new loans. The other way of lowering interest expenditures through falling interest rates might have a low possibility to occur in these years.

Some of the very indebted owner-occupiers will end up in foreclosure; many will have lost income and some will obtain "expensive" loans, i.e. short-term (consumer) loans with high risk premiums just to meet the required payments on debt they had in front of them; all of them have to pay moving expenditures and (sooner or later) some foreclosure expenditures. Most owner-occupiers in arrears or foreclosure must reduce non-housing consumption expenditures, and they do not count as indebted owner-occupiers any longer.

Owner-occupiers with positive equity will experience that falling house prices reduce their equity, reducing possible equity withdrawal. The higher risk premiums on interest rates have made it more expensive to borrow. The instability in the economy and the housing market makes owner-occupiers save more and consume less. Therefore, the falling house prices mean lower non-housing consumption for this group too – but only in the short run.

The buyers have bought at lower prices and obtained lower debt. The resulting lower housing expenditures mean that they have more left for non-housing consumption.

When estimating the aggregate housing wealth effect on consumption when housing prices fall, the selling owner-occupiers' lower non-housing consumption possibilities must equal the buyers' larger non-housing consumption possibilities. In the short run, the process may have a different nature, strength and time lag for established owners and the entering buyer, and the reduction of non-housing consumption may therefore dominate. In the long run, such adjustment differences must be offset.

---

<sup>19</sup> However, during these years, owner-occupiers had to repay a higher part of the debt service due to legal restrictions on mortgage loan profiles, which must have limited the effect of lower interest payments somewhat.

Different studies have estimated the positive *marginal propensities to consumption* out of increasing housing wealth. During a housing price downturn, a reverse influence on the marginal propensities to consume might be expected. This may have a psychological explanation since an owner-occupier family may find that they have lower and riskier savings in the house. Therefore, they may increase savings and reduce consumption. Possibly, the influence of falling house prices on the marginal propensity to consume may deepen the downward cycles in the consumption ratio, but only for a while; then the effect will level out and consumption stabilize at normal levels for the families. Consumption reactions on house price changes may be strongest in periods when housing prices are turning around – upwards as well as downwards.

Recently, Muellbauer has focused on the effect on consumption of the many improvements of the mortgage systems with more favourable access to credit and the credit expansion under the heading “the housing collateral channel”. Such changes mean “*the easing of credit market conditions has caused a significant rise in the consumption to income ratio and a positive shift in the housing collateral effect.*” Muellbauer, (2007, p. 270); see also Aron et al. (2007), Mishkin, (2007) and Case and Quigley (2008, p. 163).

These mortgage changes utilize a residential property’s value as collateral, giving the borrower the advantage of a lower interest rate because the legal procedure, the foreclosure, ensures the lender a lower loss in case of default. But the improvements are one-off affairs, which release adjustments over a period. Moreover, some new mortgage products do not give the borrower an advantage at all and leave no room for increased consumption. Some of the changes of the last decades might have increased the risks unintentionally (Scanlon et al., 2008), which can be exposed in coming years. Aspects of the subprime crisis provide examples. Also, because of the improved access to mortgages, housing prices started to fall later and from a higher level. Now the dropping housing prices can be influenced downwards, as Muellbauer remarks: “A “*credit crunch*” can contract these...*aspects of access*” (2007, p. 280). Since he presented his paper, the credit crisis has resulted in the reverse effect that the international demand for mortgage backed securities has weakened considerably and added extra risk premium to interest rates. Today, the sign for the “housing collateral channel” might be negative.

It can be concluded that drastically falling housing prices must reduce the non-housing consumption for owner-occupiers with negative equity and owners in foreclosure. At the aggregate macroeconomic level, the popular belief that falling housing prices lead to large reductions in consumption are very exaggerated. Possibly only in the transition phase from increasing to falling house prices or from falling to increasing house prices, can an unmistakable housing wealth effect on aggregate consumption be observed, caused by a temporary reduction of the marginal propensities to consume.

## **CONCLUSION: A NEW HOUSING MARKET UPTURN WILL APPEAR...**

### **18. No housing crisis lasts forever...**

The cyclical nature of housing markets means that a housing price downturn must end some day. Sticky house prices downwards complicate any estimation of house price changes for the years to come. Normally, economic forecasts for business cycles cover one or two years, but housing price upturns as well as downturns last somewhat longer.

When the recent housing market upturns in many countries ended in 2007, they had lasted longer than ever experienced before in the U.S. and Europe (at least since 1970). In accordance with the OECD study by Girouard et al. (2006), 14 of the 18 OECD countries included had experienced a rather long housing price upturn. The average duration of upturns was 22.7 quarters or 5½ years, but already by 2005, the last year for which house price data are included, the housing price upturn had lasted longer in 14 countries, with one exception (New Zealand), as seen in Table 6.

*Table 6.  
The last period with major real house price upturn for OECD countries.*

	Upturn period	Increase	Duration, quarters
<i>United States</i>	<i>1995Q1-2005Q2</i>	<i>52.7%</i>	<i>41</i>
<i>Japan</i>	<i>1977Q3-1991Q1</i>	<i>77.6%</i>	<i>54</i>
<i>Germany</i>	<i>1976Q2-1981Q2</i>	<i>15.7%</i>	<i>20</i>
<i>France</i>	<i>1997Q1-2005Q1</i>	<i>74.3%</i>	<i>32</i>
<i>Italy</i>	<i>1998Q2-2005Q1</i>	<i>49.6%</i>	<i>27</i>
<i>United Kingdom</i>	<i>1995Q4-2005Q2</i>	<i>137.4%</i>	<i>38</i>
<i>Canada</i>	<i>1998Q3-2005Q2</i>	<i>39.2%</i>	<i>27</i>
<i>Australia</i>	<i>1996Q1-2004Q1</i>	<i>84.7%</i>	<i>32</i>
<i>Denmark</i>	<i>1993Q2-2004Q3</i>	<i>93.4%</i>	<i>45</i>
<i>Finland</i>	<i>1993Q2-2000Q1 and 2001Q3-2005Q2</i>	<i>85.8%</i>	<i>42</i>
<i>Ireland</i>	<i>1992Q3-2005Q1</i>	<i>242.7%</i>	<i>50</i>
<i>Korea</i>	<i>2001Q1-2003Q3</i>	<i>24.5%</i>	<i>10</i>
<i>Netherlands</i>	<i>1985Q3-2005Q1</i>	<i>183.1%</i>	<i>78</i>
<i>New Zealand</i>	<i>2000Q4-2005Q1</i>	<i>56.0%</i>	<i>17</i>
<i>Norway</i>	<i>1993Q1-2005Q2</i>	<i>136.3%</i>	<i>49</i>
<i>Spain</i>	<i>1996Q4-2004Q4</i>	<i>114.2%</i>	<i>32</i>
<i>Sweden</i>	<i>1996Q2-2005Q2</i>	<i>80.1%</i>	<i>36</i>
<i>Switzerland</i>	<i>1976Q3-1989Q4</i>	<i>73.5%</i>	<i>53</i>

Source: Girouard et al. (2006), p. 8.

It is not obvious that the size and length of a housing market upturn will be reversed at the next downturn. Especially the sticky prices downwards can influence the situation. The owner-occupiers in many countries, their governments and central banks may hope that the current housing price downturn can be stopped at a higher real house price level than formerly known. An argument could be that lowered payments on mortgages due to the low interest rate regime, more favorable access to mortgages, new mortgage loan types with low payment features etc. will make it possible to service a higher real housing price level than before.

Another positive feature for the future housing market would be if higher inflation could reduce real house prices, without affecting the nominal house prices too much. In that case, the number of foreclosures would be relatively smaller.

Unfortunately, the possibility of a negative outcome is high, as statistical evidence shows that real housing prices during a downward cycle can fall below the former “equilibrium” level. The recent years’ steep housing price rise brought the house prices far above former maxima. At the moment, a bottom for the housing market is not visible, as IMF observed in July 2008 (IMF, 2008b).

However, the housing price downturn will end some day, perhaps as the result of a positive shock, or perhaps when housing prices turn around because lower house prices have made it “cheap” to buy housing. On that day, people will stop thinking that house prices can never rise again.

## Literature

Allen, Franklin and Douglas Gale (2007): “*Understanding Financial Crises.*” Oxford.

Ball, Michael (2008): “*RICS European Housing Review 2008*”. RICS research. savills. [www.rics.org](http://www.rics.org)

Bernanke, Ben S. (2008): “*Mortgage Delinquencies and Foreclosures*”. Speech at the Columbia Business School’s 32nd Annual Dinner, New York. May 5, 2008.

Case, Karl E., John M. Quigley and Robert J. Shiller (2001): “Comparing wealth effects: the stock market versus the housing market”. *National Bureau of Economic Research. NBER Working Paper 8606*.

Case, Karl E. & Robert J. Shiller (2003): “Is There a Bubble in the Housing Market?” *Brookings Papers on Economic Activity*, Vol. 2, pp. 299-342.

Case, Karl E., John M. Quigley and Robert J. Shiller (2005): “Comparing wealth effects: the stock market versus the housing market”. *Advances in Macroeconomics*. Vol. 5, No. 1.

Case, Karl E. and John M. Quigley (2008): “How Housing Booms Unwind: Income Effects, Wealth Effects, and Feedback through Financial Markets.” *European Journal of Housing Policy*. Vol. 8, Number 2, June, pp. 161-180.

Danmarks Nationalbank, 2008: “*Statistics on the balance sheets and flows of the MFI sector.*” July.

Davis, E. Philip (1995): “*Debt, Financial Fragility and Systemic Risk.*” Oxford.

Englund, Peter and Yannis M. Ioannides, (1997): “House Price Dynamics: An International Empirical Perspective”. *Journal of Housing Economics*. Vol. 6, issue 2, pp. 119-136.

European Mortgage Federation (2008): “*Quarterly Statistics. 1<sup>st</sup> Quarter 2008*”. July.

European Mortgage Federation (2007) “*Hypostat 2006.*” EMF, Brussels

Federal Reserve Bank of Kansas City, (2007): “*Housing, Housing Finance, and Monetary Policy*”. Symposium proceedings. Federal Reserve Bank of Kansas City’s Jackson Hole Symposium, 31<sup>st</sup> August – 1<sup>st</sup> September 2007. - <http://www.kc.frb.org/home/subwebnav.cfm?level=3&theID=10548&SubWeb=5>

Girouard N, Kennedy M and Andre C (2007): *Has the rise in debt made households more vulnerable?* Economics Department Working Paper number 535, OECD, ECO/WKP(2006)63.

Girouard, Nathalie, Mike Kennedy, Paul van den Noord and Christophe André (2006): *Recent house price developments: The role of fundamentals.* Economics Department Working Papers No. 475. OECD. ECO/WKP(2006)3.

Green, Richard K and Susan Wachter (2007): “*The Housing Finance Revolution*”. – In: Federal Reserve Bank of Kansas City, (2007), pp. 21-67.  
[http://www.kc.frb.org/Publicat/Sympos/2007/PDF/Green\\_Wachter\\_0415.pdf](http://www.kc.frb.org/Publicat/Sympos/2007/PDF/Green_Wachter_0415.pdf)

Herring, Richard and Susan Wachter, 2003: *Bubbles in Real Estate Markets*. Chapter 14, pp. 217-229 in: William C. Hunter, George G. Kaufman, Michael Pomerleano, 2003: *Asset Price Bubbles: The Implications for Monetary, Regulatory, and International Policies*. MIT Press: Cambridge, MA.

Hoeller, Peter and David Rae (2007): "*Housing Market and Adjustments in Monetary Union*". Economics Department Working Paper No. 550. OECD ECO/WKP(2007)10.

IMF (2008a): "*World Economic Outlook April 2008. Housing and the Business Cycle*." World Economic and Financial Surveys.

IMF (2008b): "*Global Financial Stability Report Market Update July 28, 2008*".

Kaminsky, Graciela L. and Carmen M. Reinhart (1999): "The Twin Crises: The Causes of Banking and Balance-Of-Payments Problems." *The American Economic Review*, Vol. 89, No. 3. pp. 473-500. June.

Kranendonk, Henk and Johan Verbruggen (2008): "*Are houses overvalued in the Netherlands?*" CPB Memorandum. Number 200. Centraal Planbureau. 22 April 2008.

Leamer, Edward E. (2007): "*Housing is the Business Cycle*". – In: Federal Reserve Bank of Kansas City, (2007), pp. 149-233 . [http://www.kc.frb.org/publicat/sympos/2007/PDF/Leamer\\_0415.pdf](http://www.kc.frb.org/publicat/sympos/2007/PDF/Leamer_0415.pdf)

Ludvigson, Sydney C. (2007): "*Commentary: Housing, Credit and Consumer Expenditure*". – In: Federal Reserve Bank of Kansas City, (2007), pp. 335-349.  
[http://www.kc.frb.org/publicat/sympos/2007/pdf/Ludvigson\\_0415.pdf](http://www.kc.frb.org/publicat/sympos/2007/pdf/Ludvigson_0415.pdf)

Lunde, Jens (2008): "*Do house price booms and busts influence consumption? – some influence from Denmark*". Unpublished paper. Department of Finance. Copenhagen Business School.

Lunde, Jens (2007): "*Distributions of owner-occupiers' housing wealth, debt and interest expenditure as financial soundness indicators*." Department of Finance. Copenhagen Business School. Working Paper 2007/1.

Lunde, Jens (2005): "*The owner-occupiers' capital structure during a house price boom. – Does negative equity exist as a permanent feature in the Danish housing market*". Working Paper. WP 2005-3. Department of Finance. Copenhagen Business School.

Meen, Geoffrey (2006): "*Ten New Propositions in UK Housing Macroeconomics: An Overview of the First Years of the Century*". ICHUE Discussion Paper No. 2.

Miles, David (1994): "*Housing, Financial Markets and the Wider Economy*". Wiley.

Mishkin, Frederic S. (2007): "*Housing and the Monetary Transmission Mechanism*". Finance and Economics Discussion Series. 2007-40. Washington: Board of Governors of the Federal Reserve System, August. – And in: Federal Reserve Bank of Kansas City, (2007), pp. 359-413. -  
[http://www.kc.frb.org/Publicat/Sympos/2007/PDF/Mishkin\\_0415.pdf](http://www.kc.frb.org/Publicat/Sympos/2007/PDF/Mishkin_0415.pdf)

Mishkin, Frederic S. (2008): "Outlook and Risks for the U.S. Economy". *Speech* at the National Association for Business Economics Washington Policy Conference. March 4, 2008.  
<http://www.federalreserve.gov/newsevents/speech/mishkin20080304a.htm>

Muellbauer, John N. (2007): "*Housing, Credit and Consumer Expenditure*". – In: Federal Reserve Bank of Kansas City, (2007), pp. 267-334. - [http://www.kc.frb.org/publicat/sympos/2007/PDF/Muellbauer\\_0415.pdf](http://www.kc.frb.org/publicat/sympos/2007/PDF/Muellbauer_0415.pdf)

Reinhart, Carmen M. and Kenneth S. Rogoff (2008): "*Is The 2007 U.S. Sub-Prime Financial Crisis So Different? An International Historical Comparison*." Working Paper 13761. National Bureau of Economic Research. January 2008.

Scanlon, Kathleen, Jens Lunde and Christine Whitehead (2008): "Mortgage product innovation in advanced economies: More choice, more risk." *European Journal of Housing Policy*. Vol. 8, Number 2, June, pp. 109-132.

Shiller, Robert J. (2005): *Irrational Exuberance*. Second Edition. Princeton and Oxford.

Shiller, Robert J. (2007): "Understanding Recent Trends in House Prices and Home Ownership". – In: Federal Reserve Bank of Kansas City (2007), pp. 89-123.  
– [http://www.kc.frb.org/publicat/sympos/2007/PDF/Shiller\\_0415.pdf](http://www.kc.frb.org/publicat/sympos/2007/PDF/Shiller_0415.pdf)

Whitehead, Christine M.E (1996): "Trends in the provision of housing finance in sixteen countries." *European Mortgage Review*. July, pp. 18-22.

Økonomiministeriet (1994): "Den danske pengeinstitutsektor." Oktober. ["The Danish Banking Sector."]