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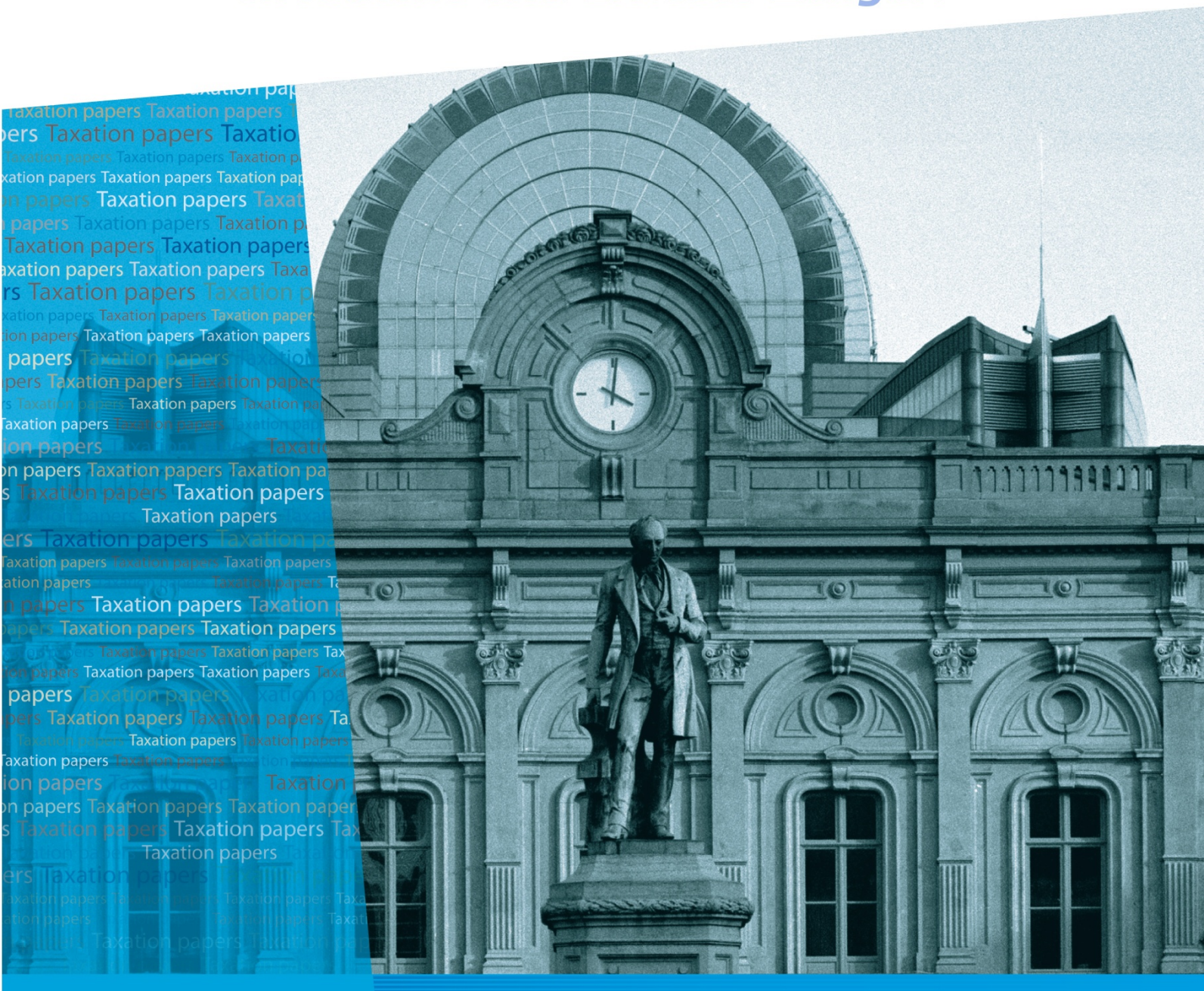

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The Role of Housing Tax Provisions in the 2008 Financial Crisis

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Abstract: The 2008 financial crisis is the worst economic crisis since the Great Depression of 1929. It has been characterised by a housing bubble in a context of rapid credit expansion, high risk-taking and exacerbated financial leverage, ending into deleveraging and credit crunch when the bubble burst. This paper discusses the interactions between housing tax provisions and the financial crisis. In particular, it reviews the existing evidence on the links between capital gains taxation of houses, interest mortgage deductibility and characteristics of the crisis.

Keywords: financial crisis, tax policy, housing, interest deductibility, capital gains

JEL classifications: E62, G21, H24, H31

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1. Introduction

The 2008 financial crisis has severely hit the world economy. While taxes have not generated the crisis, some aspects of tax policy may have led to increased risk-taking and indebtedness. Tax incentives may indeed have exacerbated the behaviour of economic agents, leading them to wrong economic decisions. There is evidence that tax systems around the world usually favour home-ownership for instance. This situation may in turn lead to too-high demand in the housing market, boosting prices, which, combined with lax lending practices, paves the way for a speculative bubble.

This chapter proposes a detailed account of the manner in which tax provisions relating to the housing market may have led to the banking crisis. Monetary and regulatory policies have opened the possibility for a housing bubble which eventually burst and created a credit crunch because of a lack of confidence between actors on financial markets actors. Governments reacted by a combination of capital and liquidity injections, regulatory measures and fiscal stimulus.

In most narratives of the financial crisis, the dynamics of the US housing market play a decisive role: in fact, the problems started with the housing market and the financial structure that was built on it. Not surprisingly, many commentators have found fault with some tax provisions that may have contributed to overheating the housing market. In particular, attention has been focused on the tax treatment of residential housing capital gains and on the deductibility of interest expenses on mortgages.

Some commentators argue that the quasi repeal of residential housing capital gains taxation in 1997 may have fuelled the housing bubble. On the other hand, both the OECD and the IMF do not believe that this factor has played a significant role; also the academic research that has analysed the dynamics of the US housing market tends to reach the same conclusion.

The role of the mortgage interest deductibility in the crisis is also controversial. There was no relevant change in the US tax rules on this tax break, in the last decade; the housing boom did not take place evenly in the country, although the federal tax system has a nation-wide coverage; in an international comparison housing prices went up both in countries where interest on mortgages was deductible and in countries where it was not or it was deductible only within limits. Nevertheless, some commentators consider this tax break like a catalyst in a chemical reaction: the deductibility did not cause the bubble, but it may have accelerated the run-up in prices. It remains true that the US

regime is one of the most generous in an international comparison; while all other countries allow interest deductibility only for acquisition or renovation of residential buildings, the US tax code extends this allowance to other purposes ("home equity loan"); moreover, the relatively generous limits to the benefit are capped on the amount of the mortgage, not on the amount of interest payments (like in all other countries). Since it is proportional to debt, the tax break is more relevant for riskier mortgages with higher interest rates and may have contributed to trigger "gambles" on housing, especially in the context of "exuberant" price expectations.

The chapter is organised as follow. Section (2) provides an introduction to developments of the 2008 financial. Section (3) offers a reflection on whether specific tax provisions may have aggravated the crisis by encouraging home-ownership and risky behaviours. Section (4) contains some final remarks.

2. The build-up to the 2008 financial crisis

2.1. General economic conditions before the crisis

The events leading to the current financial and economic crisis are heavily debated and the dust has not yet settled on the real causes of the crisis. The arguments set in this paper are therefore somewhat speculative, subject to debates and will eventually be judged by History. Yet, a majority of commentators point to several elements that have facilitated an easing of credit and an increase in risk-taking.

The economic conditions in the early 2000s were characterised by the burst of the dot-com bubble which peaked in March 2000 before bursting until the end of 2002 (figure 1). The reaction of the Federal Reserve to this stock market decline has been to ease economic conditions using declining interest rates. Accordingly, the US Primary Credit Discount Rate was progressively lowered from 6.5% at the peak of the bubble in mid-2000 to 1% by mid-2003 (figure 2)[1].

[1] Note that the Federal Reserve most certainly also tried to combat the economic consequences of the September 11th, 2001 terrorist attacks. The US economy was also in a context of low inflation, if not of deflation risk, which facilitated an ease in monetary policy.

Figure (1): Nasdaq Composite Index 1993-2004

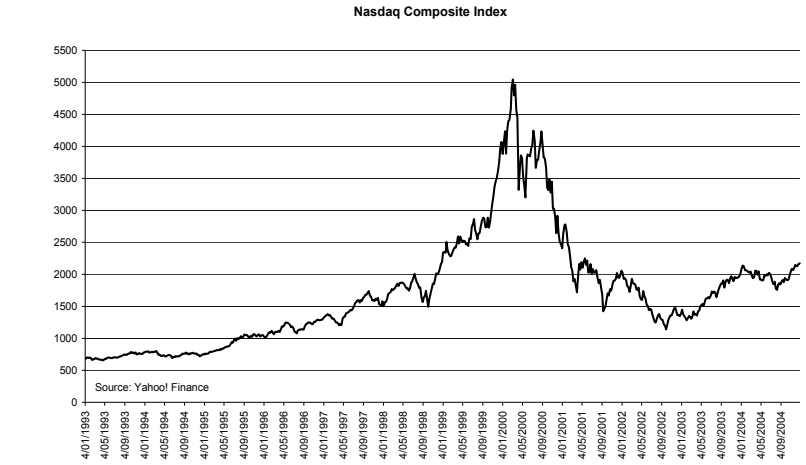
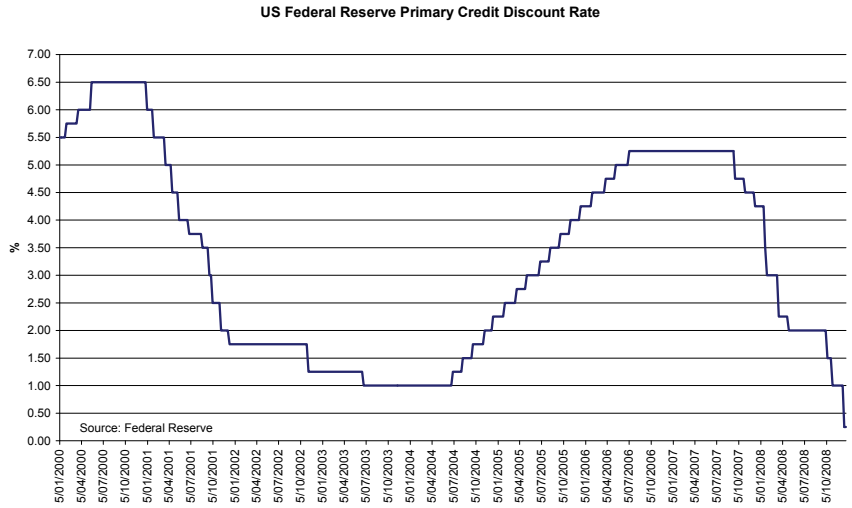


Figure (2): US Fed Discount Rate 2000-2009



A second characteristic of the world economy in the early 2000s was massive inflows of capital on international financial markets. The US Capital and Financial Account is illustrative of this phenomenon (see figure 3)[2]. Between 1995 and 2000, it increased from 1.54% to 4.25% of GDP and continued to rise in the first half of the 2000's to peak at 6.10% of GDP in 2006. The main driver of this expansion was net portfolio investment, which grew from USD 42.7 billion in 1998 to over USD 807 billion in 2007 – a twenty-fold increase over nine years (figure 4). Therefore, the US economic situation in the first half of the 2000s was characterised by rapid economic recovery with low interest rates, increasing financial inflows and a high degree of risk-aversion in stock markets, following the tech bubble burst.

[2] The Capital and Financial account is composed of the net capital transfers, the change in the domestically-owned assets abroad, and the change in foreign-owned assets at home. It mirrors the current account (which is composed of the trade balance and the net unilateral current transfers).

Figure (3): US Capital and Financial Account

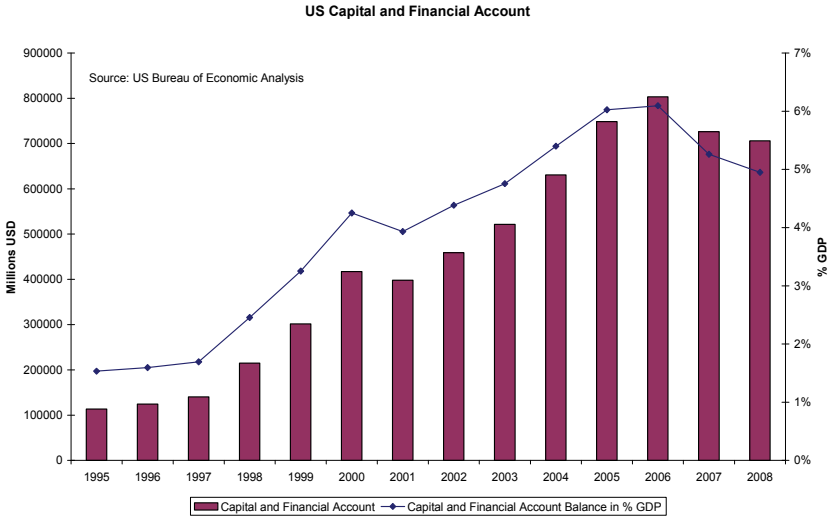
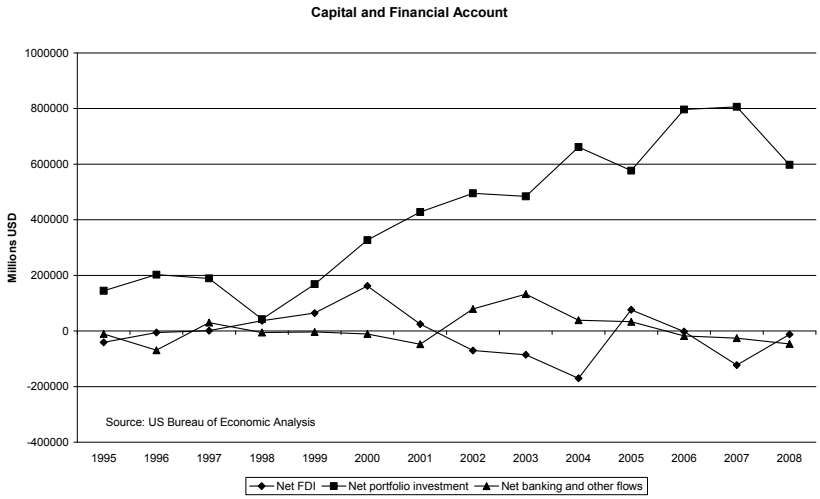


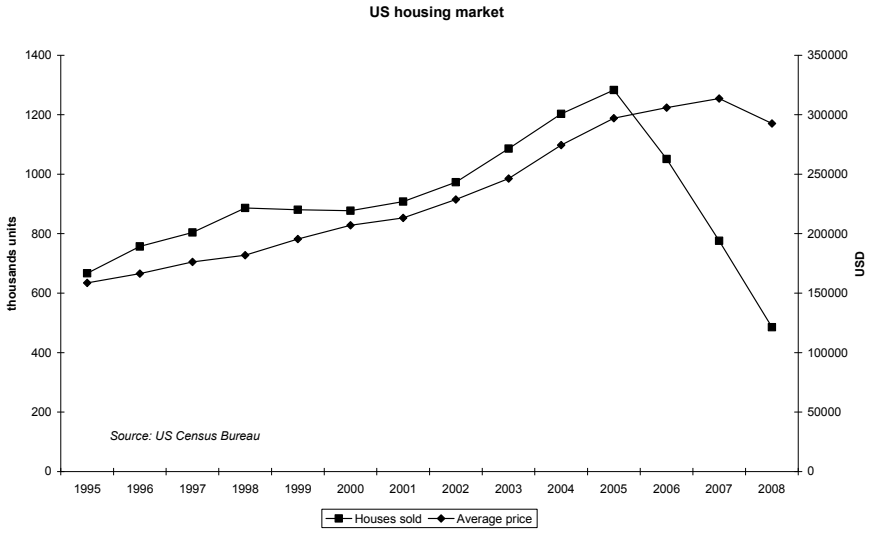
Figure (4): US Capital and Financial Account: components



2.2. Promotion of home ownership, deregulation and subprime credits

In their search for new places where to invest, many economic agents saw property as safer and more profitable. The conditions were consequently slowly put in place for a housing bubble. In four years - between 2001 and 2005 - the number of houses sold increased by 41.3% and the average price rose by 39.3%. In addition to economic conditions (low interest rates, large inflow of capital that needed to be recycled in the economy and cold feet of investors towards stock markets), several regulatory measures have also created incentives towards home-ownership.

Figure (5): Home sales and prices in the US



First, politicians desired to expand home-ownership, especially for poorer families. Two institutions played a particular role in this policy: Fannie Mae and Freddie Mac. The former (officially named the Federal National Mortgage Association) was created in 1938 under the Roosevelt administration to buy and securitize mortgages to ensure enough liquidity for lending institutions. It became a subsidised - albeit independent - body in 1968 and was complemented in 1970 by a competitor, Freddie Mac (Officially named the Federal Home Loan Mortgage Corporation), which achieved similar functions on this secondary mortgage market. The role of Fannie Mae and Freddie Mac is to purchase loans from mortgage sellers such as banks and financial institutions, securitize them into mortgage-backed bonds and resell those on the secondary market, guaranteeing the principal and interest of the loan in exchange of a fee. It proves therefore to be a powerful instrument to refuel lending institutions with fresh cash and subsequently allow them to engage in additional lending activities. Fannie Mae and Freddie Mac have also been instrumented at varying degrees by US administrations to expand housing credit to middle- and low-income families as well as in distressed areas.[3]

[3] See the 1977 Community Reinvestment Act (CRA), which was extended by the 1992 Federal Housing Enterprises Financial Safety and Soundness Act and scrutinized by the 1995 New Community Reinvestment Act, or the decision of the Department of Housing and Urban Development in 2000 to order Fannie Mae to devote half of its business to poorer families, which was increased to a 56% goal in 2004.

Second, the US tax system contained several incentives for home-owners to take mortgages. For example, the 1986 Tax Reform Act disallowed consumers to deduct interest payments from consumers' loans (car loans, credit cards loans, etc.). This creates a perverse incentive for home-owners to use or refinance their home mortgages – whose interest payments remain deductible – to pay off their other debts or to extract cash for personal expenses. This incentive has been increasingly larger because of the wealth effect of ever-rising home values. In addition, the 1997 Taxpayer Relief Act simplified the tax treatment of housing capital gains and increased in many cases the tax exemption for these incomes – giving further incentives to buy houses – and the 2002 Single-Family Affordable Housing Tax Credit Act and the 2004 American Dream Downpayment Act provides further fiscal measures in favour of home ownership.

In this context, financial institutions reacted by opening the credit tap, helped by more lax regulations. The 1999 Gramm-Leach-Bliley Act repealed some of the provision of the 1933 Glass-Steagall Act that disallowed financial institutions to combined commercial, insurance and investment activities and this might have led to more risk-prone attitudes from the part of commercial banks[4]. Risk-taking was also encouraged by relaxed rules on capital adequacy and new accounting standards. The decision on 28th April 2004 by the Securities and Exchange Commission to loosen the capital rules for large financial institutions (following their request) and to let computer models of those investment companies determine the level of risk of investment (i.e. de facto self-monitoring) led to a sharp increase in the leverage of the main US financial institutions[5]. This trend was also facilitated by the BASEL-II agreements, which entered into force in 2008 and gave more scope for financial institutions to assess their risks, as well as by the introduction of the International Accounting Standards in 2005, which forced companies to register immediately gains and losses on financial assets, leading to more stock volatility.

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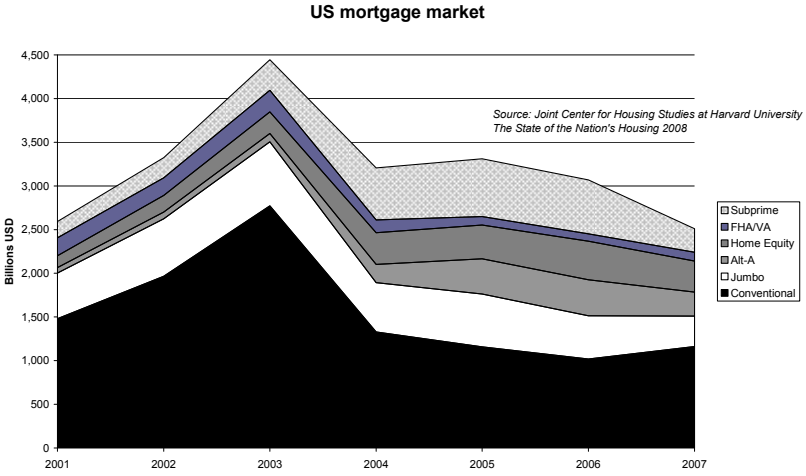
[4] See Lloyd (2009).

[5] See http://securities.stanford.edu/news-archive/2004/20040428_Headline08_Drawbaugh.htm; http://www.nytimes.com/2008/10/03/business/03sec.html . Between 2003 and 2007, the leverage of the top five US financial institutions evolved as follow: Lehman Bothers from 22.7% to 29.7%, Bear Stearns from 27.4% to 32.5%, Merrill Lynch from 15.6% to 30.9%, Goldman Sachs from 17.7% to 25.2% and Morgan Stanley from 23.2% to 32.4%. In 2007, their total debt amounted to USD 4.1 trillion, a third of US GDP (sources: Wikipedia using annual reports http://www.lehman.com/annual/2007/fin_highlights/; http://www.bearstearns.com/sitewide/investor_relations/sec_filings/proxy/index.htm; http://ir.ml.com/sec.cfm?DocType=Annual&Year=2008; http://www2.goldmansachs.com/our-firm/investors/financials/current/annual-reports/revised-financial-section-2007.pdf; http://www.morganstanley.com/about/ir/shareholder/10k2007/10k11302007.pdf)

In this context, the proportion of subprime mortgages[6] soared from 7.2% of the total in 2001 to over 20% in 2005 and 2006 (figure 6). Gambling was also at play as some studies pointed out that over a third of the houses bought were for investment or second residence purposes and those specific acquisitions were made with the hope that continued price increases would allow buyers to resell with profit. Accordingly, a third of the loans made in 2002 were either interest-only (where only interest is repaid) or negative amortization loans (where less than the interest is paid during a first period and the accrued unpaid interest is added to the outstanding amount of the loan)[7]. Moreover, an increasing number of loans were granted with adjustable-rates (ARM)[8] between 2001 and 2004 – mostly for the two pre-cited types of loans – and this despite stabilising interest rates, which possibly indicates an increasing number of credit-constrained borrowers (figure 7).

Figure (6): Prime and subprime US mortgages

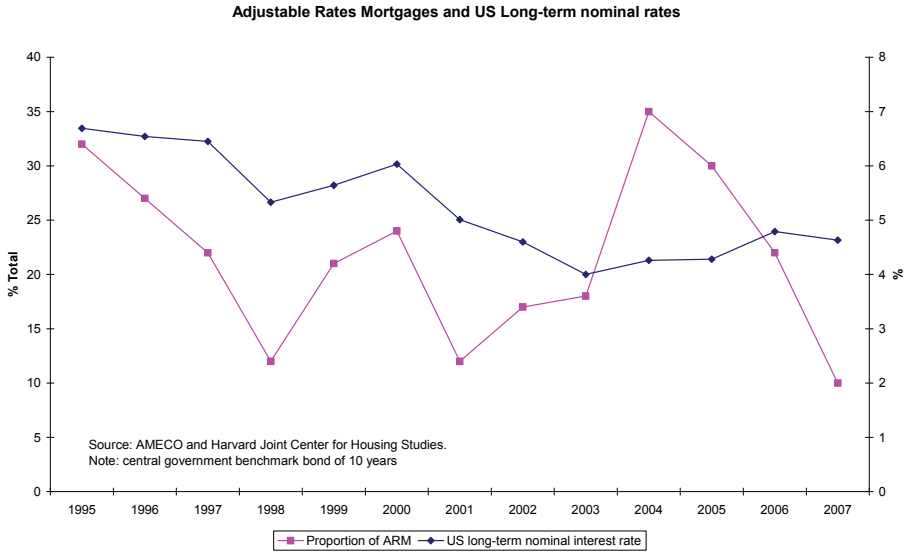


[6] By definition, a subprime loan is a loan that does not meet the 'prime' standards and is consequently risky. There may be various elements that make the loan fail the 'prime test' (e.g. length, structure, etc.). In this context, it is the profile of the borrower and/or the difference between the loan and the value of the house or the collateral. Loans are usually classified based on the Government-sponsored enterprises' guidelines. When a credit fulfils the GSE's criteria, it is labelled conventional. When the loan fulfils all guidelines but the amount of the credit (usually loans above USD 300,000), it is labelled as Jumbo. In those two cases, the creditworthiness of the borrower is not questioned and both loans are 'Prime' Loans. Non-Prime Loans can be Alternative-A when for instance the borrower has income that is difficult to assess (e.g. self-employed), a high debt-to-income ratio, few documentation, or several mortgaged houses. In this case the creditworthiness if not questioned but there is a higher risk. They can also be Home-Equity Loans, which is a heterogeneous category of second- and first-lien mortgages with high loan-to-value ratios, home improvement loans and revolving home-equity lines of credits. Finally, it also includes the subprime loans with low-credit-quality borrowers (Fabozzi, 2005)

[7] The Economist, 16th June 2005.

[8] For subprime mortgages, the proportion of fixed rate mortgages dropped from 33.2% in 2001 to 18.6% in 2005, while the bulk of the loans were of hybrid nature (i.e. with a fixed rate during an initial period of 2-3 years and then adjustable based on a reference rate) and not pure ARM. From 2005, the share of balloon mortgages in subprime mortgages jumped to reach 25%-30%. Those mortgages require a large final payment. Note also that 55%-60% of subprime mortgages were originated to extract cash while only 30%-40% of the loans were to buy a house (Demyanyk and Van Hemert, 2009).

Figure (7): Adjustable-Rate Mortgages



2.3. The securitization of mortgages

The spread of mortgages, in particular subprime loans, was largely helped by the development of new financial instruments, in particular the technique of securitization, which consists of pooling the loans into an investment vehicule and then selling securities backed by payments for these loans. In the case of mortgages, those financial instruments are Mortgage-Based Securities (MBS). Typically, the financial institution will buy the claims of thousands of mortgages and pool them into a so-called special purpose vehicule (SPV), which is a legal entity outside of the balance-sheet of the financial institution, allowing them to bypass capital ratios regulations. The securities are separated in several tranches - senior, mezzanine (or junior) and equity (non-investment grade) – with a sequential preference for the claims (i.e. the senior tranche has preferred claim on the proceeds over the other two and the mezzanine tranche has preference over the equity tranche). By doing so, financial institutions are able to rearrange the risk of the pool and to redistribute it across investors with different risk-aversion[9]. This in turn lowers to cost of lending and extents credit to borrowers with lower credit quality.

An important development has been the issue of Collaterized Debt Obligations (CDOs), a family of Asset-Based Securities which is backed by diversified debt-obligations such as mortgages-backed securities, corporate bonds, bank loans, credit

[9] See Fabozzi (2005) for a description of these instruments and Baily et al. (2008) for a brilliant description of the processes.

cards debt, etc[10]. While a MBS is backed by mortgage payments, a CDO is backed by Mortgage-Based Securities within a portfolio and represents therefore a re-securitisation (Baily et al, 2008). The advantage of a CDO is that it allows financial institutions to rearrange the securities into new compartments within the CDO and to transform low-rated MBS into high-rated CDOs. According to Baily et al. (2008), CDO issuances went from virtually zero in 1995 to over USD 500 billion in 2006 and virtually all CDOs issued over the last years were backed by low-rated subprime MBS.

This securitization process was itself helped by the emergence of a new class of derivatives which allowed transferring the credit risk to a third party: the Credit Default Swaps (CDS). CDS are common instruments, representing 73% of the USD 2.3 trillion credit derivative products in 2002 (O'Kane, 2005). The principle is that a third party accepts to assume the default risk of a specific asset in exchange of an income. This process allows the CDO issuer to shield from the risk and to increase the rating of its bonds. The CDS market has mainly developed outside organised markets (i.e. they were Over-The-Counter operations) and grew exponentially from virtually zero in 2001 to about USD 15 trillion in 2005 and over USD 60 trillion in 2007 (Baily et al., 2008).

2.4. The bubble burst

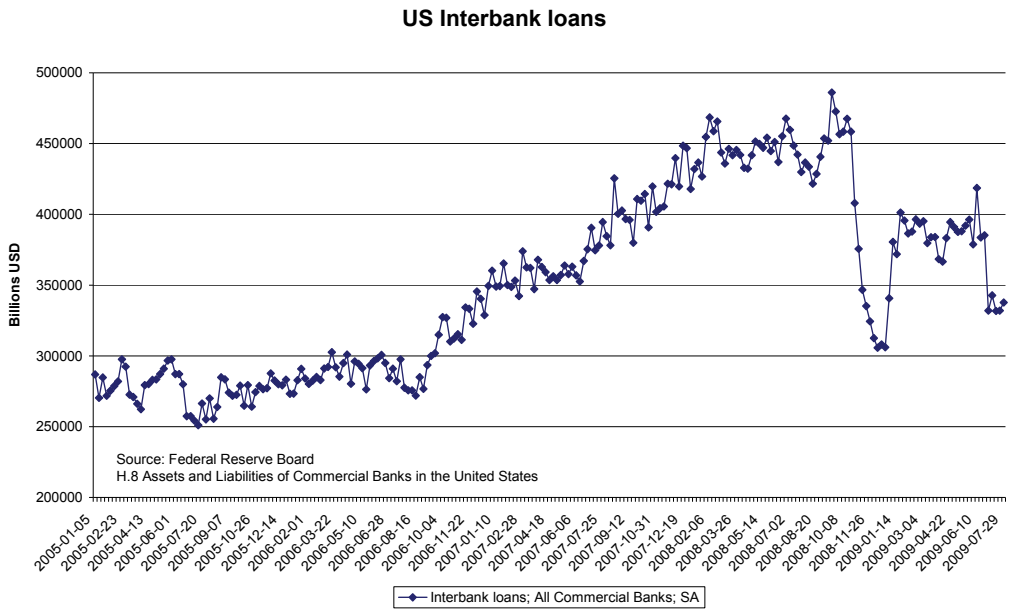
With US inflation rising from 1.6% in 2002 to 2.3% in 2003, 2.7% in 2004, 3.4% in 2005, peaking at 4.3% in June 2006[11], the Federal Reserve gradually raised interest rates from 1% to 5.25% (see Figure 2) and the first cracks appeared in the housing market. Some borrowers, especially those with adjustable-rate mortgages (ARM), started feeling the pain and could eventually not repay their mortgage. The number of foreclosures increased exponentially from 885,000 in 2005 to 1,259,118 in 2006, 2,203,295 in 2007 and 3,157,806 in 2008.[12] The number of houses sold declined and prices levelled off before plunging (see figure 5).

Financial institutions started to be hit as they were heavily indebted and exposed via Mortgage-Backed Securities, whose value are based on mortgage payments and house values. HSBC announced in February 2007 that it was writing down for USD 10.5 billions of subprime MBS. This event was followed in April by the bankruptcy of New Century Financial, the US largest subprime lender. In July, the collapse of two hedge

[10] See Fabozzi (2005), chapters 30 and 31.
[11] Inflationdata.com
[12] Realtytrac.com

funds run by Bear Stearns because of subprime losses was another alarming sign of deterioration as were the announcements of heavy losses in other financial institutions, putting some of them on the verge of bankruptcy (e.g. Bear Stearn) - with in some cases bank runs (e.g. Nothern Rock in the UK). The near-collapse of the banking system happened in September 2008. On 7th, ailing Government-sponsored enterprises Fannie Mae and Freddy Mac were urgently nationalised. On 14th September, Merrill Lynch saw itself close to illiquidity and was sold to Bank of America. The next day, Lehman Brothers filed for bankruptcy, and the day after, American International Group (AIG), one of the largest CDS providers, avoided bankruptcy only thanks to a USD 85 billion loan from the Federal Reserve[13]. The uncertainty about external positions and liquidity or solvability of financial institutions led to a sharp drop in confidence among financial market actors. This led in turn to a sharp increase in the TED Spread – an indicator of perceived credit risk – which went over 300 basis points on 17th September[14] and to a sharp fall in the interbank lending activities (see figure 8). These financial problems spread into the real economy via a credit crunch, creating a drop in available funds for private investment.

Figure (8): US interbank loans



The banking crisis also quickly spread to stocks markets. The S&P-500 index started to decline from its highest value of 1565.15 points on 9th October 2007 to 1251.70

[13] See Wibaut (2008) for an excellent description of the events.

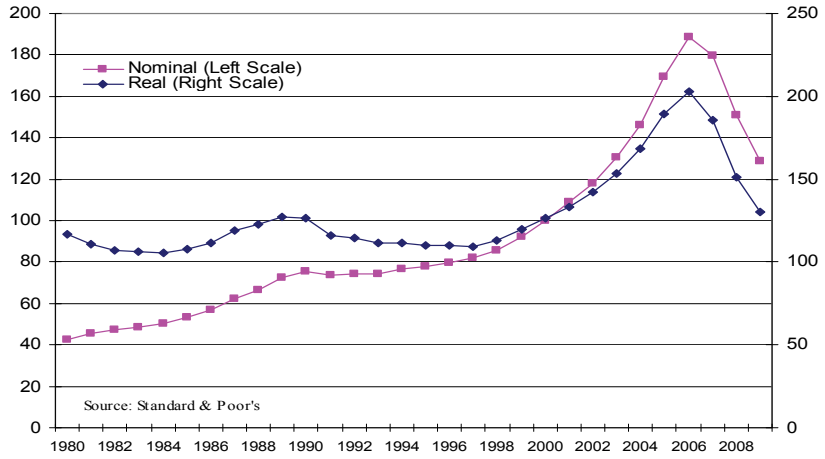
[14] The TED spread is the difference in basis points between the short-term interbank rate (i.e. the LIBOR) and the 3-month US treasury rate. Its historical fluctuation is between 10 and 50 basis points. On 10th October 2008, it reached a record 465 basis points (http://www.tedspread.com)

points on 12th September 2008, a decline of more than 20% in less than a year. On 15th and 17th September, amid large financial institutions' turmoil, it lost twice an additional 4.71%. The descent into hell was not over yet with stock crashes of 8.8, 7.6, 9.0 and 8.9% on 29th September, 9th October, 15th October and 1st December, respectively. On 9th March 2009, the S&P-500 index stood at its lowest point so far: 676.53 points, only 43.2% of its value 15 months earlier.

3. Have taxes on housing contributed to the crisis?

The end of the speculative price bubble in the US housing market has been identified as an important trigger for the financial crisis. As lined out above, US households received credits for consumption purposes on the assumption that the increase in house prices would be large enough to cover the outstanding credits. Figure 9 shows the Case-Shiller House Price Index for the US and illustrates the strong increase in house prices since the end of last century and the dramatic decrease in house prices since 2006.[15] With the end of increasing house prices, these credits and especially the accompanying securitized products (see also section 2.3 above) became toxic assets, leaving the financial sector with unknown risks in their balance sheets. This in turn led to a world-wide credit crunch as financial companies stopped lending money to each others since the risk that the trading partner would run out of liquidity increased. At the end of the process, credits to other economic actors (household, companies) were also sharply reduced. This is one reason why the real economy started to suffer from the crisis at a later stage compared to the financial sector.

Figure (9): Case-Shiller House Price Index



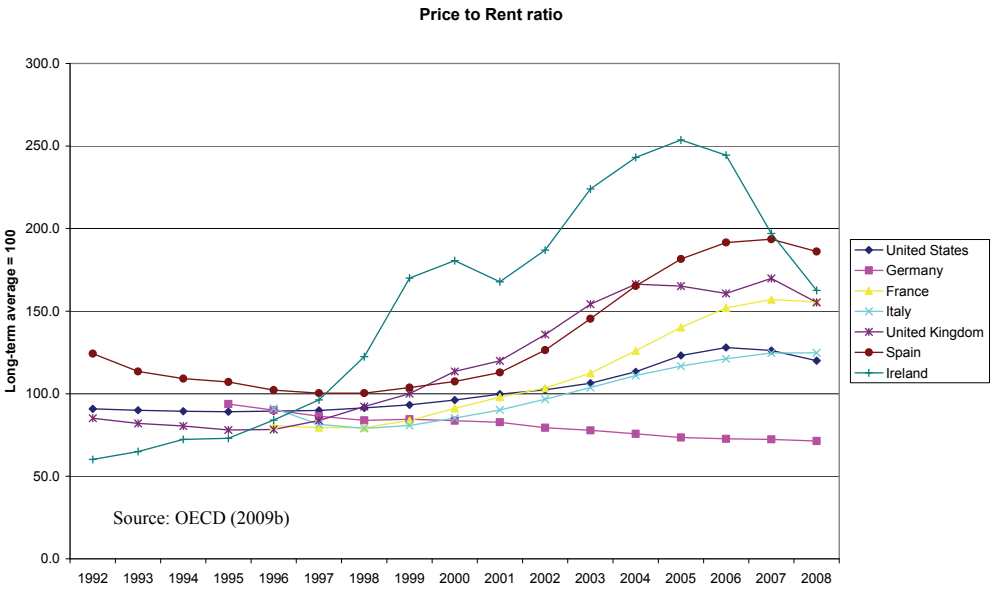
[15] A description of the index can be found here: http://www2.standardandpoors.com/portal/site/sp/en/us/page.topic/indices_csmahp/0,0,0,0,0,0,0,0,0,0,2,1,0,0,0,0,0.html

In Europe, Ireland and Spain faced similar price bubbles in the housing market and when the international crisis hit, this led to a severe downturn in those two countries that formerly showed some of the best economic performance in the Euro Area. Other European countries like the UK, France, Sweden and the Netherlands experienced similar increases in house prices over the last decades, albeit at a lower degree.[16]

While real house prices rose in many countries, the same was true for another important indicator of the attractiveness to own a house: the price-to-rent ratio. Comparing this ratio across countries allows comparing the incentives to own a house. The ratio compares the discounted rents for a house with its current price. If the ratio is larger than 100, it is more attractive to own a house, as renting is more expensive than buying a house. As seen in figure 10, the price-to-rent ratio significantly increased in many countries over the last decade, especially in Ireland and Spain. Ireland also faced the most dramatic decrease after the peak was reached in 2005.

[16] See Hilbers et al. (2008).

Figure (10): Price to Rent Ratio



Given these observations, the question arises how taxes might influence house prices. To answer this question, we first sketch a simple and general economic model of the housing market, which provides a basis for discussion of the effects of some basic housing tax provisions. Second, we compare the tax systems of different countries with respect to the US system. Finally, we discuss the possible role of housing tax provisions in the financial crisis.

3.1. The economic analysis of the housing sector

The decision of buying a house entails two economic dimensions:[17] a consumption decision and an investment-production decision. The first facet is related to the decision of households to consume housing services, which is mainly related to the quality of the house. The household decides what type of house and in which location he would like to consume. The investment-production decision is related to the potential value increase of the property, as households take into account that owning a house is also an investment. Housing is a durable good which can potentially be sold at a higher price, even after years of use. This makes the decision of buying a house more complex than consumption decisions for other goods that are mainly based on the price and on the consumer's budget constraint.

[17] A detailed analysis of the functioning of the housing market can be found in Pozdena (1988).

The standard economic analysis of the housing sector moves from the observation that the housing market actually consists of two interrelated markets: one for the existing stock of houses, which determines their price, and one for the new flow of construction, which determines residential investment.[18]

The equilibrium on the market of existing houses requires that owners, as investors, earn on the housing investment the same return as on alternative investments:

$$R_H = [(1-\tau^{PIT})i^M + \delta + \beta + m + \tau^P - (1-\tau^{CG})E(\pi^H)]P_H \qquad [1]$$

where R_H denotes the marginal value of rental services per period, τ^{PIT} the relevant personal income tax rate,[19] i^M the financing cost (assumed for simplicity equal to the investor's opportunity cost of funds),[20] δ the depreciation of the stock of existing houses, β the risk premium required by the investor to be owner rather than tenant, m the maintenance cost per unit value, τ^P the property tax rate, τ^{CG} the housing capital gains tax rate, $E(\pi^H)$ the expected housing price appreciation and P_H the price of existing houses.[21] The above equation can be also interpreted as follows: in the long run the cost of owning a house should be equal in equilibrium to the cost of renting it, with R_H representing the annual cost of renting and the quantity in square brackets representing the user cost of housing or ownership (or "imputed rent").[22]

Assuming that the rental value R_H is decreasing in the stock of houses H (i.e. $dR_H / dH < 0$), and that the user cost of housing is positive, equation [1] can be interpreted as a (downward sloping) demand function, whose slope is steeper the lower is the user cost.

A housing supply function can be easily derived assuming a positive relationship between (net) residential investment and the ratio of house prices over building costs (C_H).[23] Formally:

$$H_t - H_{t-1} = \Delta H_t = \phi(P_{H,t} / C_{H,t}) - \delta H_t \qquad (2)$$

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[18] Standard references are Kearl (1979), Topel and Rosen (1988) and Poterba (1984, 1991, 1992).
[19] We assume the case of mortgage interest deductibility, as in the US. However, the main conclusions hold even under more general assumptions.
[20] See Poterba (1984), footnote 6.
[21] See Van den Noord (2005).
[22] See Hilbers et al. (2008, p.8).
[23] See Poterba (1991).

The short-run price elasticity of housing supply is equal to ϕ; the long-run elasticity is larger and equal to ϕ/δ. In this simple model house prices play the same role of the value of the firm's stock in Tobin's q dynamic investment model.

This simple and quite general demand-supply model of the housing market predicts that:

- since housing supply is basically fixed in the short run, the housing market is subject to price overshooting in the face of demand shocks; the housing market is therefore intrinsically volatile;
- the deductibility of mortgage interests, by reducing the user cost of ownership, decreases the demand elasticity; it therefore increases the volatility of the housing market;[24]
- the increase in volatility could have negative effects especially if agents form expectations (also partially) in an extrapolative manner, inducing prolonged price upswings or downswings not linked to "fundamentals";[25] in the best-case scenario, the choices of households and firms could be temporarily distorted; in the worst-case scenario a price bubble may form;
- rise in expectations on housing price appreciation and more generous tax breaks on housing (for example, lower capital gains tax rates) may generate, in principle and under some conditions, unsustainable dynamics in the housing market.[26]

3.2. The taxation of housing in Europe and the US

There is a great diversity of housing tax regimes across countries.[27] International comparisons are difficult because of the complexity of tax codes (in terms of deductions, exceptions, threshold limits and so on).

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[24] In general, the price sensitivity of demand for housing is inversely related to the extent of preferential tax treatment for housing and with the expected rate of housing price appreciation (see Van den Noord, 2005).

[25] For the US, see Case and Shiller (1988). See also the general discussion in Poterba (1991).

[26] The model in the text can easily account for disequilibria dynamics. Suppose, for example, that for whatever reason the user cost of ownership becomes equal to zero. This can happen because of: either a decrease in the (net) mortgage interest rate (for instance, due to more generous interests deductibility and/or lower monetary policy interest rates), given expectations; or a sudden increase of the expectations of housing price appreciation; or a decrease of taxes on housing capital gains; or a combination of the previous factors. The right-hand side of equation [1] in the text becomes equal to zero. The left-hand side can be equal to zero only when the demand for housing is infinite. With very strong demand for housing there will pressure on prices in the short run (given the low short-run supply elasticity). Regardless of how expectations are formed, agents will anticipate higher prices and this would push the user cost into negative territory, with a further increase in demand, and so on. Here we have a vicious cycle - a price bubble process - which can be rationalized even by a very simple model, with very general assumptions.

Table 1 summarizes the information concerning the tax treatment of mortgage interest expenses, imputed income of owner-occupied housing and capital gains on first-home selling for a set of countries comprising the US, UK, Italy, Spain, Ireland, the Netherlands, Belgium and Germany.[28]

From a theoretical point of view, under a comprehensive income tax, a fully neutral taxation of owner-occupation requires the taxation of imputed rents and capital gains of housing and the deductibility of mortgage interests.[29] Real-world tax systems are anything but neutral. In fact, owner-occupation is tax-favoured with respect to renting in many countries, and with respect to most forms of return on personal savings: with only a few exceptions, imputed rents and capital gains on owner-occupied housing are not taxed; the tax relief on mortgages' interest further reinforces the tax bias towards housing.

Table 1 shows that only Belgium and the Netherlands tax the imputed rent on owner-occupation. Mortgage interest costs attract tax relief in all countries except Germany and the UK. In the Netherlands, Belgium and the United States interest expense is deductible from the tax base (but in Belgium the deduction is capped at a given amount of interest payments, whereas in the US the cap refers to the amount of mortgage principal), so the tax advantage depends on the marginal tax rate of the owner. In the other countries the tax relief for financing costs mainly takes the form of a tax credit, often with limited duration.[30] Finally, basically no country in our set taxes capital gains on owner-occupied housing.

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[27] For a review of housing tax regimes in Europe, see Hilbers et al. (2008). See also ECB (2003) and Van den Noord (2005). By comparing the information in these papers with ours, it is possible to get a picture of how housing taxation has changed in the last 10 years.

[28] Tax information refers to the 2009 tax codes reported in IBFD (2009). See also Borselli et al. (2010).

[29] See IMF (2009, p. 17) and Van den Noord and Heady (2001, p. 30).

[30] For example: in Spain the taxpayer is allowed to set off against his income tax liability 15% of the costs incurred for acquisition or renovation of his primary residence, up to €9,015 (i.e. the maximum credit is €1,352); in Ireland, for first-time buyers, the relief - given at source with the effect of reducing the borrower's interest payments - takes the form of a tax credit at a rate of 25% for years 1 and 2, at 22.5% for years 3, 4 and 5, 20% for years 6 and 7 (the interest relief is restricted to an interest payment of €20,000 for a couple); in France interest on loans for purchase or the construction of the principal residence entitles the taxpayer to a 20% tax credit for the initial 5-year period of the loan (40% for the first 12 months only), up to €7,500 per year for a couple (i.e. the maximum credit is €3,000 in the first year and €1,500 for the remaining four years); in Italy interest on mortgage loans taken to build or buy the principal residence entitles the taxpayer to a 19% tax credit up to €4,000 (i.e. maximum credit equal to €760).

Table (1): The taxation of owner-occupied houses in Europe and the US

	Taxation of imputed rents	Mortgage interests tax relief	Capital gains taxation
Belgium	YES[31]	Tax deductibility with a limit[32]	NO
France	NO	Tax credit for the first five years with a limit	NO
Germany	NO	NO	NO
Ireland	NO	Tax credit for the first seven years with a limit[33]	NO
Italy	NO	Tax credit with a limit	NO
The Netherlands	YES[34]	Tax deductibility without limit	NO
Spain	NO	Tax credit with a limit on the amount of housing costs	NO[35]
UK	NO	NO	NO
US	NO	Tax deductibility with a limit on the amount of mortgage principal ($ 1 million)	NO (if CG<$500,000)

Source: IBDF (2009)

To get an idea of the quantitative effects of the personal income tax rules concerning imputed income, mortgage interests and capital gains, we compute the *effective* personal income tax rate on housing using a simplified version of the IMF methodology.[36] Unlike the IMF, we do not consider property and transaction taxes,[37]

[31] In Belgium the imputed rent is a "cadastral income", reviewed last time in 1975 and indexed to inflation since 1990. This income is generally lower than its market counterpart, especially for old houses. For new constructions, particularly when they are built on new housing zones, the cadastral incomes are instead much closer to the market values. In the case of owner-occupation, the deemed income (after the deduction of some deemed expenses) is not subject to the income tax, but only to an "immovable withholding tax" (*precompte immobilier*), with a rate that depends on the region where the property is located (see Haulotte et al., 2010). Municipal and provincial surcharges increase the effective tax rate of the "immovable withholding tax" to between 18 and 50% or more (IBFD, 2009). In the computations of the effective tax rate in figure 11 we assume an "immovable withholding tax" rate of 34% (the average between 18 and 50%).

[32] The *deduction pour habitation propre et unique* refers to mortgage interest, mortgage capital, and to particular insurance premiums regarding the loan (Haulotte et al., 2010, p. 29). The limit to the deduction is €2,770 for the first 10 years and €2,080 thereafter.

[33] Since 1 May 2009 in Ireland the interest relief is restricted to the first seven years of the mortgage. Recently Ireland has started to phase out mortgage interest relief: the tax break will be abolished from 2018; for the new loans the relief will be reduced in the next years (see IBDF, 2010).

[34] In the Netherlands the imputed income is calculated as a percentage (up to 0.55%) of the market value of the property. In the computations of the effective tax rate in figure 11 we use a rate of imputed income of 0.55% (however, notice that from 2009 there is no maximum imputed income (see IBFD, 2009)).

[35] In Spain full rollover relief is available for the selling of the primary residence. Moreover, housing capital gains are exempt when realized by a taxpayer aged 65 or more (IBFD, 2009).

[36] See IMF (2009). The IMF methodology considers the purchase of a house at a predetermined price ($ 250,000), with a holding period of 10 years. The effective tax rate is computed as the ratio of the present value of all taxes paid during the holding period to the present value of house incomes; the yearly housing income is the sum of the imputed rent and the capital gain, assumed to be equal to 4 and 5 per cent of the house price, respectively. As in the IMF study, we use a mortgage interest rate of 6 per cent and a discount rate of 5 per cent; we also assume that the purchase is 80 per cent mortgage-financed. In contrast with the

focusing only on the personal tax system. The results of these computations are shown in figure 11.[38]

In all the countries the personal tax system provides incentives to owner-occupation: since the effective average tax rates are negative in all countries save Germany and UK, housing investment is subsidized by the personal income tax system. This is particularly true in the Netherlands and in the US, where mortgage interest is deductible basically with no limits. Owner-occupation is tax-favoured de facto in Germany and the UK, since the effective average tax rate (equal to zero) is generally lower than those on alternative investments.

3.3. Housing taxation and the financial crisis

The main direct cause of the financial crisis lies in the bursting of the US housing bubble, so in assessing responsibility for the financial crisis it is natural to begin by examining the structure and the dynamics of the US housing market, particularly its demand side. The focus here is on the possible role of the "tax factor" in the US housing market dynamics.[39]

The IMF and the OECD do not consider tax rules as the main reason for the housing bubble: housing prices increased in countries with different tax systems, and there were no tax breaks clear and big enough to explain the price dynamics that were observed.[40] At the same time, many commentators have found fault especially with the tax treatment of housing capital gains and mortgage interest deductibility. Let us consider each of them in turn.

Figure (11): Effective average tax rates on owner-occupation (personal income tax system)

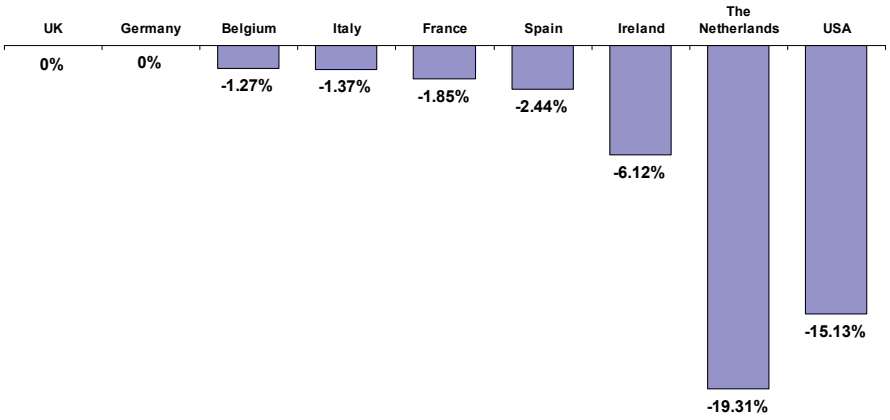
IMF study, the price of the house in our computations is set at €500,000; this permits the highest possible tax relief to be obtained with reference to all countries with a limited tax credit for interest.

[37] Which can arguably be substantial for some countries (see IMF, 2009).

[38] For Belgium, as Van den Noord (2005, p. 36), we assume that the imputed income is the same fraction of the value of the unit of housing as in the Netherlands (0.55%). To take into account the difference between the two tax systems, in contrast with Van den Noord's analysis, we consider a "fiscal value" of the house lower than the market value. We assume a 1/3 cut of the market value of the house. Moreover, we assume that the Belgium "fiscal" imputed income grows at the rate of 2% (rather than at 5%, as in the Netherlands). For the sake of comparison, assuming no cut of the market value and a 5% growth rate for the "fiscal" imputed income (a set of assumptions more correct for new houses), the effective tax rate on housing would be -0.42% (rather than -1.27% of figure 11); assuming a 1/2 cut of the market value and a 2% growth rate for the imputed income, the effective tax rate would be instead -1.58%.

[39] For in-depth analyses of the dynamics of the US housing market, see Case and Shiller (2004), Glaeser et al. (2005), Himmelberg et al. (2005) and Shiller (2005).

[40] See IMF (2009) and OECD (2009a).



Assumptions: Mortgage fixed rate = 6%; Discount rate = 5%; House value = EUR 500,000; House inflation = 5%; Imputed rent = 4%; 80% debt financing; Max PIT rate. Source: our calculations. Data: IBFD 2009. Methodology: IMF (2009).

3.3.1. Capital gains taxation

Following the bursting of the US housing bubble, it has been asserted that the housing policies pursued in the US over the last fifteen years are partly to blame for the financial crisis, particularly the policies aimed at increasing home ownership through access to mortgage loans for first-time buyers with low and variable incomes.[41] A tax measure in the same vein is the repeal of capital gains taxation on home selling with the Tax Relief Act of 1997 (henceforth TRA97).

TRA97 generated a change in the tax treatment of housing capital gains. Previously, housing capital gains had been taxed when homeowners sold their houses, unless they resorted to the "roll-over rule" or to the "55-age rule". The roll-over rule allowed homeowners to postpone the taxation, provided they bought a house of equal or higher value within two years. The 55-age rule allowed sellers aged 55 or more to claim a one-time exclusion of USD 125,000 against the capital gains tax. TRA97 abolished both rules and allowed homeowners to claim a USD 500,000 exclusion (USD 250,000 for singles) against the capital gain tax as often as every two years. Since the ownership and use tests to claim the exclusion are not very strict, it was often possible to get the tax benefit for a second home.[42]

[41] See Kats (2009).
[42] See Shan (2008)

The repeal of capital gains taxation may have had an important impact on the effective taxation on housing: using the same IMF methodology and the same assumptions as above,[43] it can be demonstrated that following the TRA97 the effective average tax rate on housing decreased from -6.37% to -17.12%.[44] However, the overall effects of TRA97 on the US housing market are theoretically ambiguous,[45] and the existing empirical evidence does not offer clear-cut answers.[46]

Some commentators observe a structural break in the time series of US house prices between 1997 and 1998 (see figure 9) and associate it with the repeal of capital gains taxation. In subsequent years, other factors became important: the rise in house prices, drawing investors' attention; the end of the stock market boom following the peak in March 2000; the attempt by the Federal Reserve to avoid a severe recession in 2001 by pumping liquidity into the system; the public policies aimed at increasing the homeownership rate. However, the new provisions on capital gains taxation of 1997 may have contributed to the house price boom, "fuelling the mother of all housing bubbles",[47] playing the role of a precipitating factor. Their effects were then amplified by mechanisms involving investor confidence and expectations of market performance (besides the other factors mentioned above); adaptive or extrapolative expectations may have played a role in these amplification mechanisms.[48]

Other commentators hold that the repeal of the capital gains taxation did not play a significant role in the genesis of the financial crisis. The IMF considers the role of the 1997 measures unclear, since the elimination of roll-over relief may have resulted in worse tax treatment for some taxpayers, and since house prices did not increase

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[43] In the computations we use the highest marginal tax rate in 1996 and 1997, which was equal to 39.6%. The capital gains tax rate applied for 1996 is 28% (see Shan, 2008).

[44] The average tax rate in 1996, -6.37%, is the average between the tax rate for homeowners aged 55 years or more at the time of selling (-8.23%) and the tax rate for homeowners aged less than 55 years at the time of selling that decide to buy down after 10 years (-4.51%).

[45] For example, TRA97 has also lowered all long-term capital gains tax rates, that have been further reduced in 2001 and 2003 (see Shan, 2008). The reduction of capital gains tax rate with the TRA97 may have had effects on the market for rental properties (where the rents are determined) affecting then indirectly the market of owner-occupied houses (see equation [1] in the text). The lower long term capital gains tax rates may have allowed building rental projects in which landlords could break even also with lower rents. And lower rents could have eased the demand pressure on the market for owner-occupied houses, contrasting the possible demand pressure coming from the repeal of capital gains taxation on first-home selling.

[46] See Bier et al. (2000), Cunningham and Engelhardt (2008), Biel and Hoyt (2008), Shan (2008) and Quayes (2010).

[47] See Smith (2007), Bajaj and Leonhardt (2008) and Gjerstad and Smith (2009).

[48] See Shiller (2005, p. 69).

everywhere, implying that other factors were at work.[49] More importantly, perhaps, many scholars assign no significant role in the price boom to the 1997 break.[50]

[49] See IMF (2009).

[50] See Case and Shiller (2004), Glaeser et al. (2005), Himmelberg et al. (2005) and Shiller (2005). Burman (2008) argues that the new capital gains tax rules were unimportant with respect to the bubble, stressing that the previous rules raised little revenues.

3.3.2. Mortgage interests deductibility

In the US it is possible to deduct interest costs on mortgages taken to buy, build or improve a house (so called "home acquisition debt"), up to USD1 million.[51]

In general, mortgage interest deductibility, particularly when unlimited (as in the Netherlands) or with mostly non-binding limits (as in the US), decreases the cost of ownership and tends to tilt the households' decisions whether to rent or buy a house towards ownership; it also encourages people to spend too much on housing, and it may actually end up subsidizing the wealthier homeowners, that have higher marginal tax rates, and the construction industry.[52] Moreover, since the benefit is proportional to debt, the deduction is basically a subsidy to "gambles on housing",[53] and this could lead to excessive risk-taking.[54]

As for risk-taking, since the second half of the 1990s, credit scoring methods have been widely used in the US to price lending. Probably, this has facilitated the access to credit for many high-risk borrowers. Obviously, given the amount of debt, the riskier the borrower, the higher the interest rate charged, and the greater the tax benefits from deduction. Unlike countries which cap the deduction at a given amount of interest, the United States establishes the cap to the mortgage principal, and this implies a tax favour to riskier borrowers.[55]

In contrast with other countries,[56] in the US it is possible to claim a deduction for interest on mortgage loans taken out for purposes other than house purchase, for example to buy a car or pay the college tuition, up to $100,000 (so called "home equity loan"). Home equity – the difference between the market value of the house and the loans secured by the value of the house – can be used as collateral.

Home equity loans may have played an indirect role in leading up to the financial crisis. In fact, the run-up in US housing prices, along with the rise in home acquisition debt fuelled by "bull" price expectations, may have directly fed the growth of home

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[51] Mortgage interest is an itemized deduction. In the US system, most taxpayers can choose to deduct either the total amount of itemized deductions or a standard deduction; the latter depends on the filing status of the taxpayer. In general, itemized deductions are chosen by wealthier taxpayers (Glaeser and Shapiro, 2002).

[52] See Glaeser (2009).

[53] See Sullivan (2005) and Glaeser (2009).

[54] Someone argues that there could be positive externalities associated with homeownership and housing consumption that might be worth subsidizing through mortgage interest deductibility. These externalities are however very difficult to measure and, moreover, interest deductibility appears to have been ineffective in promoting homeownership in the US (See Glaeser and Shapiro (2002) and the references therein).

[55] The same holds true in countries, as the Netherlands, where there are no limits to interest deductibility.

[56] In the Netherlands it was possible to claim interest deductions on equity withdrawals until 1996.

equity loans, thereby providing part of the mortgage raw materials for the strong growth of the securitization industry (see section 2.3). This process may have been magnified by the deductibility of mortgage interests.

The deductibility of interest on home equity loans clearly creates a bias to personal debt, encouraging people to prefer borrowing against home equity to other forms of borrowing, and to extract the equity from their home for personal and business reasons.

The lowering over time of personal income tax rates in the US has reduced the size of the tax benefit stemming from the mortgage interest deductibility,[57] that remains however substantial by international standards (see figure 13). And when the international comparison refers, not only to interest tax relief, but also to the taxation of imputed rents, and taxes on capital gains, ownership and transactions, the US remains in the set of countries with lower housing taxation.[58]

However, the role of tax deductibility *alone* with respect to the recent bubble is unclear because of conflicting evidence. Considering our set of countries (see section 3.2), it is true that the Netherlands, the other country with strong interest deductibility and providing substantial tax benefits according to our computations, belongs to the "fast lane" set of countries, according to the IMF ranking based on the house price increases in the last 20 years;[59] this holds even for Ireland, although to a lesser extent. On the other hand, the UK too was a "fast lane" country basically without having provision for any interest tax relief for most of the recent boom period[60]. More importantly, as far as the US is concerned, there was no break in the tax relief for interest expense to explain the housing boom. Moreover the price dynamics in the US differed across states and regions, although there are no interstate differences in interest deductibility.

A possible indirect role of the interests deductibility for the US housing market dynamics may be related to the large increase in low- and no-downpayment mortgages during the second part of the price boom period,[61] that was probably facilitated by the

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[57] See Poterba (1992).
[58] See IMF (2009, pp. 20-21).
[59] See Hilbers et al. (2008).
[60] The UK phased out interests deductibility over the period 1974-1999. First, a ceiling on the mortgage principal eligible for deduction was introduced. Then, the rate at which it was possible to claim the deduction was gradually lowered to zero (OECD, 2000, p. 151).
[61] According to the surveys conducted by the National Association of Realtors, in 2003 the median downpayment for first-time homebuyers was equal to 6%, a figure that fell to 2% in the period 2004-2007. The median downpayment for repeat homebuyers also declined starting in 2004, although to a lesser extent (see www.realtor.org).

housing policies enacted in 2004 and subsequent years.[62] Given the asymmetric treatment of personal debt and equity, the decrease of mortgage downpayments may have given rise indirectly to a tax break: since the cost of personal housing debt is deductible, unlike the opportunity cost of housing equity, the consequence of the increase of no- or lower downpayment mortgages may have been an abrupt fall in the user cost of housing.[63]

Despite the inconclusive evidence based on simple time series and cross-section comparisons, it is very likely that the interest tax relief may have somehow contributed to housing price inflation in the US,[64] along the lines of a catalyst in a chemical reaction. The simple and very general economic model sketched above predicts that tax breaks of the kind provided in the US can contribute to the volatility of the housing market; and that mortgage interest tax relief can be a contributing factor of instability if it is coupled with low financing costs and/or "exuberant" housing price expectations.

In conclusion, tax incentives may have played a role in the development of the housing bubble, but the size of this role is difficult to assess, although the odds are that this role has been secondary to monetary policy and credit markets developments.

4. Conclusions.

The 2008 financial crisis has already proven to be the worst economic crisis since WWII. The burst of a housing bubble in the United States has led to a stop in confidence of investor towards all mortgage-based assets that had flourished in previous years and to uncertainties with regards to the financial exposure and liquidity of world major financial institutions. This banking crisis eventually spread to a stock market crash and to a credit crunch in the real economy. The rapid expansion of credit and the increasing degree of

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[62] On 16 December 2003 the American Dream Downpayment Act was signed into law, with a view to assisting low-income first-time homebuyers by providing downpayment. Among other things, the Act expanded the supply of no-downpayment mortgages for first-time homebuyers (US Department of Housing and Urban Developments, 2005).

[63] As an example, using the highest marginal tax rate of the federal income tax in 2003 and 2004 (35 per cent), and assuming a downpayment to buy the house equal to 5 per cent in 2003 and 0 per cent in 2004, the effective average tax rate computed with the IMF methodology (see section 3.2) would decrease from -17.97% to -18.92%. Since the reduction of downpayments referred especially to low-income first-time buyers, it is reasonable to compute the change of the effective taxation also with the lowest income tax rate (10%); in this case the effective average tax rate would decrease from -5.13% to -5.41%. Of course, it is hard to say if and to what extent these changes in the economic advantageousness of the housing investment may have been statistically significant at the margin for housing market dynamics.

[64] See Sullivan (2008) and Surowiecki (2009).

indebtedness and risk-taking behaviour of financial institutions has been a striking characteristic of the build-up to the crisis.

In this context, one important policy question is whether tax systems may have created negative incentives, favouring risk. Several tax provisions in favour of home-ownership may have led to increased purchases of houses in several countries. However, the available evidence is mixed when it comes to assess whether different tax treatments have led to different price developments, suggesting that lax monetary policy and increased risk-taking by lenders are more powerful explanations for the housing bubble. In turn, this risk-taking behaviour may have been exacerbated by tax provisions on the treatment of executive compensation and by tax arbitrage possibilities across different types of investors.

Countries have implemented strong policy responses to the crisis. In particular, many countries have taken tax measures as part of broader fiscal stimulus packages. They have however come short of changing tax systems. Two issues have attracted some attention: the idea of a using taxation to prevent speculative bubbles and the development of tax systems that are more neutral with regards to the source of financing for firms.

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