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POLICY AND PRACTICE

Subsidization as motor to residential mortgage securitization in the US

Marietta E. A. Haffner

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Abstract Residential mortgage securitization on the secondary mortgage market in the United States has grown enormously since 1970. This contribution describes the growth, especially the growth of the large special circuit housing finance system within the secondary mortgage market. Fannie Mae and Freddie Mac are at the heart of it. Different housing finance systems are introduced first in order to position the system of securitization. The technicalities of securitization are then briefly covered, before the focus shifts to the development of residential mortgage securitization in the United States. The reasons for expansion of the secondary mortgage market are traced, and especially of Fannie Mae and Freddie Mac and the benefits they offer to homeowners and the buyers of securities. The success of securitization by Fannie Mae and Freddie Mac does not seem to be based on a miracle of competition in the housing finance market, but largely on regulation and subsidization of these organizations. Nowadays, the question has become whether the undesired effects of this large part of the housing finance market outbalance the desired effects.

Keywords Residential MBSs · Secondary mortgage market · Securitization · United States

1 Introduction

The aims of US housing policy can be considered to coincide with the aim of housing affordability: (1) the provision of affordable housing for low-income households and (2) the accumulation of sufficient funds to finance homeownership. Financing homeownership has commanded considerable attention. As a result, the securitization of residential

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mortgages on the secondary mortgage market has been able to grow successfully, as the citation of Colton (2002, p. 7) implies: "By many standards, the United States has the best housing finance system in the world." Even before the so-called subprime crisis started in the housing finance market in 2007, there was reason to have doubts about this statement, as this contribution will show.

Securitization is one of the ways in which financial institutions raise capital, by selling securities to investors, with the pool of mortgages acting as collateral and using the proceeds for mortgage loans to homebuyers. The interest that homebuyers pay on the mortgages is then distributed to the providers of the capital—the buyers of the mortgage securities—as return on their investment.

This contribution traces the story of residential mortgage securitization on the secondary mortgage market in the United States. It also traces the outcomes of this system which, when two important organizations operating in the secondary mortgage market Fannie Mae and Freddie Mac are concerned, can be ascribed to regulation and subsidization, instead of competition in the housing finance market. The contribution questions whether the benefits of this special circuit of housing finance outbalance the undesired effects.

The article starts by describing different housing finance systems. It briefly explains the technicalities of securitization, before focusing on the development of residential mortgage securitization in the United States; it then traces the reasons for the expansion of the secondary mortgage market, and especially of the growth of Fannie Mae and Freddie Mac. Finally, the desired and undesired outcomes for homeowners and investors in this segment of the housing finance market are discussed.

2 Housing finance systems

As dwellings are expensive to buy, they are often purchased with the aid of loan finance in industrial countries (Boléat and Coles 1987). And as dwellings have a long service life, loan finance with small repayments over a long period of time will be a more or less logical strategy; especially if the buyer/owner does not have enough capital to pay the purchase price outright. The two types of housing finance systems, which organize the availability of housing finance for potential owner-occupiers, and which will be described in turn are the deposit-taking system and the mortgage bank system.

The *deposit-taking system* is also known as the retail system because a deposit-taker attracts retail funds from people/savers who deposit cash with the deposit-taking institution. Such institutions or banks then will lend these funds to borrowers, e.g., households wishing to fund the purchase of a house. One weakness in this system may be its susceptibility to mismatches between the assets and the liabilities of the institution, when borrowing is short while lending is long. The deposit-taking system lay at the start of mortgage lending savings and loan associations in the United States.

In a *mortgage bank system* or *mortgage bond system*, banks raise funds from the wholesale market instead of from depositors in the retail sector. The mortgage bank raises cash by selling mortgage bonds to investors, who may be deposit-taking financial institutions or institutional investors such as pension funds, which attract funds from the retail market themselves. The funds raised by the mortgage bank may be raised on a secured basis, e.g., backed by mortgage loans. One method of wholesale funding makes mortgage banks issue large classes of bonds for a longer period with a fixed interest rate. Once they have raised the funds, they use them for mortgage loans with the same term as the bonds and at a slightly higher interest rate in order to cover costs.

3 Securitization

Securitization is a financing system which can be regarded as a variation on the mortgage bond system. Banks and other financial institutions acquire capital by converting assets into tradable securities (Colton 2002; Fabozzi and Modigliani 1992; Van Order 2006). After these securities are sold to an investor, the assets disappear from the balance sheet of the financial institution, as funds are received instead which bring liquidity. Securitizable assets are assets that are expected to generate a future flow of income, which can be converted into cash via securitization. Receivables from mortgage loans, receivables from consumer loans or credit card use are examples of such flows of income. In 2002, 80% of the volume of securitization was based on mortgage loans (Van Order 2006).

Securitization takes place on the secondary mortgage market (Fig. 1), where financial institutions raise capital by selling the mortgages which were issued to homebuyers on the primary mortgage market. The mortgage receivables are sold to intermediaries, also known as conduits or special purpose vehicles (SPVs). These receivables are then converted into specific securities and sold on to investors. The investors that purchase the securities purchase the right to the future flow of income, which consists of the interest payments and the payments towards the principal made by the borrower, after the deduction of the costs of bank and SPV.

As the securities are backed by a portfolio of mortgage loans, they are called mortgage-backed securities (MBSs), or more specifically residential MBSs (RMBSs). The simplest type of MBS is called a "passthrough." The security acts as a vehicle for the payments for interest and principal from the borrower that are passed on directly to the investor after the costs have been deducted. This way, the risks of penalty-free prepayment (specific for the US) and the risk of default are evenly spread over the investors. If securitization is not applied and the financial institution keeps the mortgages in its own portfolio, it will bear these risks itself.

Securitization also makes it possible to share the risks on a non-pro-rata basis among investors. Within a pool of MBSs many types of securities can be created with different risk–return ratios. These types can be called tranches (classes) of securities. For example, one of the most popular multi-class securities is the collateralized mortgage obligation (CMO or more generally the collateralized debt obligation, CDO), where different risk or

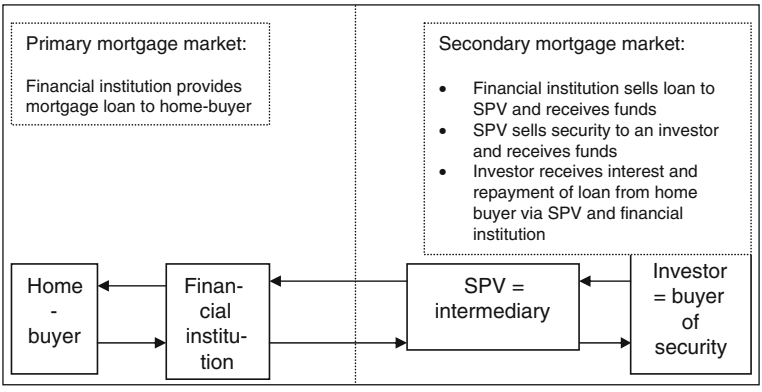

Fig. 1 Securitization: mortgage market segments, participants and financial flows

"credit classes" of securities and underlying loans are formed, each with a different repayment scheme. In a sequential retirement, once one class has received all its repayments and prepayments, it is the turn of the next class. The risk attached to the CMO in a class that receives payment later is then relatively high compared with the risk in a class that receives payment earlier. Alternatively, some classes may receive only interest payments while others receive only payments towards the principal. CMOs allow the sale of prepayment risks to investors and the restructuring of credit risks (risk of non-payment by borrower) among investors (see also Van Order 2006). Senior tranches have the first rights to the cash flows, subordinated tranches run a larger default risk.

To sum up, securitization operates in a similar way to the mortgage bond system, but with two significant differences. First, in the mortgage bond system, the function of loan originator is combined with that of security originator. In the securitization of mortgage loans, these roles are split between the financial institution (loan originator) and the SPV (security originator). The second difference between the mortgage bond system and securitization is closely intertwined with the difference of one versus two actors. Whereas, in securitization, the loans are removed from the balance sheet of the loan originator, in the mortgage bond system, they remain on the balance sheet. In securitization, financial institutions in fact trade off risks for liquidity.

4 Securitization in the United States: from roots to maturity

4.1 Roots

The roots of securitization in the US lie in a mortgage market in problems (Colton 2002; Fabozzi and Modigliani 1992). The main problem was a shortage of capital, which became particularly pressing in the 1930s in the Great Depression years, and again in the 1970s. The shortage was caused by the government-imposed system of deposit-taking banking. Because only local savings could be used for local mortgage loans, the supply of mortgage funds was fragmented, making interest rate differences between locations more of a rule than an exception.

In the 1930s, high inflation made saving less attractive, while so-called balloon mortgages had to be redeemed by one-off payments every 5 years. As people were not saving as much as before, the banks had no capital to replace these mortgages. Homeowners were therefore unable to take out a new mortgage in order to redeem the old one. The problems became insurmountable.

This prompted the federal government to introduce a package of measures. Among other things, level-payment (also called annuity), fixed-rate, fully amortized mortgages were introduced with a maximum duration of 15 years. Government also made it possible for Fannie Mae (see next section) to buy mortgage loans on the secondary mortgage market and keep them in their portfolio. Since the 1970s, Fannie Mae and Freddie Mac (government agencies; see next section) have been able to issue MBSs.

These changes allowed the home-financing system in the US to work well and enough capital became available until inflation rates crossed into double figures in the 1970s. The problem of deposit-taking banking resurfaced: banks were still financing long-term level-payment mortgages (now with a 30-year fixed interest period) while saving short.

At that time, it appeared that two special SPVs, Fannie Mae and Freddie Mac (see next section) were working efficiently. Also, the unbundling of tasks associated with the mortgage into four different parts of originating the mortgage, servicing the mortgage,

funding the mortgage, and running the credit risk resulted in scale economies (see Van Order 2006). Fannie Mae and Freddie Mac achieved cost-effectiveness for the consumer through keeping fund-raising costs low as a result of the standardization of legal products and through the automated processing of mortgage applications. The federal government therefore decided to bolster the secondary mortgage market in 1984.

4.2 Maturity

Nowadays, the players on the secondary mortgage market are, next to Fannie Mae and Freddie Mac, also Ginnie Mae and private SPVs (see also Van Order 2006). Ginnie Mae (Government National Mortgage Association, GNMA) is a government organization that issues MBSs, which are insured by the Federal Housing Agency (FHA), another government organization, and it guarantees the prompt payment of interest and principal of the underlying mortgage to the investors. The mortgage loans insured by the FHA are loans to low-income households.

Contrary to Ginnie Mae, Fannie Mae and Freddie Mac in due course acquired a quasi-public status and are referred to as government-sponsored enterprises (GSEs). They are shareholder-owned organizations which pay corporate taxes, but they operate under a congressional charter (http://www.ofheo.gov/about.aspx?Nav=73). They are to provide liquidity, stability, and affordability to the housing finance system. Since 1992, their regulator is the Office of Federal Housing Enterprise Oversight (OFHEO), an independent entity within HUD, the US Department of Housing and Urban Development, the federal department responsible for housing. OFHEO states on its website that it "works to ensure the capital adequacy and financial safety and soundness of" Fannie Mae and Freddie Mac.

Fannie Mae, formally the *Federal National Mortgage Association* (FNMA), was founded in 1938 and split into two organizations in 1968, one being Fannie Mae, the other being *Ginny Mae*. *Freddie Mac*, formally the *Federal Home Loan Mortgage Corporation* (FHLMC) was founded in 1970.

Fannie Mae and Freddie Mac nowadays have the same role on the secondary mortgage market. They issue MBSs protecting the investor against credit risk. Their purchase of securitized mortgages is restricted to the so-called prime conforming mortgages (see e.g., Zelman et al. 2007). These are mortgages that meet the underwriting standards of the GSEs in maximum loan size ($417,000 for a one-family residence in 2006 and 2007) and maximum loan-to-value (LTV) ratio (80%). They typically are single-family mortgages that are secured by one- to four-family properties.[1] When the mortgages fulfill these requirements, they are considered relatively low-risk.

Mortgages that the GSEs cannot buy because the purchase price is above the permitted conforming maximum—a measure, which is not, incidentally, intended to restrict securitization only to the smallest loans—are called prime non-conforming or jumbo loans. They are issued by private SPVs. They manage credit risk by either using mortgage insurance or issuing subordinated and senior tranches of securities (Van Order 2006).

Table 1 shows that Ginnie Mae, Fannie Mae, and Freddie Mac dominate the market of new issues of RMBSs, which had a share of 60% in the market of funding new mortgages

[1] According to their charter multifamily mortgages bought by Freddie Mac are secured by properties with five or more residential *rental* units (Freddie Mac 2008). Multifamily mortgage purchases in 2006 were no more than four percent of total mortgage purchases (OFHEO 2007c). The same percentage was true for Fannie Mae. Prime conforming mortgage purchases for condos and coops reached 13% in 2006 (Zelman et al. 2007).

Table 1 New issues of residential mortgage-backed securities in $ (in billions), 1984–2007, selected years

Year	Government SPV	Quasi-public SPVs		Private SPVs	Total
	Ginnie Mae	Fannie Mae	Freddie Mac		
1984	28	14	19	2	62
1985	46	24	39	5	114
1990	64	97	74	24	259
1995	73	110	86	35	304
2000	104	210	166	70	550
2001	167	514	378	159	1,218
2001	180	510	400	260	1,350
2002	170	740	510	430	1,850
2003	210	1,210	690	640	2,750
2004	120	520	370	890	1,900
2005	90	490	390	1,210	2,180
2006	90	480	330	1,170	2,070
2007	70	590	430	1,080	2,170
6 months					
2007 Q3	110	690	410	490	1,700

Sources: 1984–2001 from Colton (2002, p. 39); 2001–2007 from Lockhart III (2007) estimates from graph; both use data from Inside MBS and ABS

in 2001. In 2001, Fannie Mae and Freddie Mac, between them, had managed to gain a market share of 73% of the new issues of RMBSs on the secondary mortgage market hitting a new peak after fluctuating between 50% and 69% between 1984 and 2001. Ginnie Mae's market share was 14% while the private SPVs handled the rest, 13%, in 2001.

The high market shares of close to 70% through to the year 2003 were the result of a boom in the refinancing of mortgages (Lockhart III 2007). The third quarter in 2007 showed again a high market share of 65% for Fannie Mae and Freddie Mac together after 3 years of lower shares. The lower market shares can be ascribed to the growth of the so-called subprime market (Zelman et al. 2007; see Sect. 7). The increase was the result of the withdrawal of the private label securities from the market in combination with the need of financial institutions to remove assets from their balance sheets in order to strengthen them (Lockhart III 2007; see Sect. 7).

Based on these data, one must conclude that the private, but specially regulated GSEs have mostly had bigger market shares than the private labels. The "secrets" of this success will be highlighted next.

5 Who benefits from securitization by Fannie Mae and Freddie Mac?

The question of whether the incurred costs are matched with the benefits from securitization via Fannie Mae and Freddie Mac has been on the agenda in recent years. Three types of federal subsidies appear to be incorporated in the costs, one explicit one and two implicit ones, as Table 2 shows. Although no updated results for a more recent year than 2003 have been found, one must assume that these types of subsidies still exist, as the system did not change (see for example, Freddie Mac 2008).

Table 2 Estimated federal subsidies to Fannie Mae and Freddie Mac, according to beneficiary, and the total in $ (in billions), 1995–2003

Subsidies	1995	1996	1997	1998	1999	2000	2001	2002	2003
Fannie Mae									
*To debt[a]	1.7	1.5	1.8	3.2	3.3	3.6	4.8	4.4	5.4
*To MBSs[b]	1.5	1.7	1.7	2.3	2.1	1.9	4.4	5.0	7.2
*Tax and regulatory subsidies[c]	0.3	0.4	0.4	0.5	0.6	0.6	0.8	0.6	1.0
Freddie Mac									
*To debt[a]	0.8	1.1	0.8	3.3	2.4	2.4	5.0	3.8	3.9
*To MBSs[b]	1.0	1.3	1.1	1.1	2.1	1.8	2.6	3.2	2.0
*Tax and regulatory subsidies[c]	0.2	0.2	0.2	0.3	0.4	0.4	0.5	1.3	0.1
Beneficiary of subsidy									
*Mortgaged borrowers[d]	3.6	4.1	3.9	6.8	6.9	6.7	11.8	11.9	13.4
*Fannie Mae and Freddie Mac	1.9	2.2	2.1	3.9	3.9	3.9	6.3	6.5	6.2
Total	5.5	6.3	6.0	10.7	10.8	10.6	18.1	18.4	19.6

Source: Congressional Budget Office (CBO) 2001, 2004, latest available data (last searched in March 2008). The reason for the not-updated calculations is probably because Fannie Mae and Freddie Mac were behind in releasing financial statements, which were conforming to Generally Accepted Accounting Principles (GAAP; OFHEO 2007a, b, c)

[a] The subsidies to debt are present values

[b] The subsidies to MBSs guaranteed by Fannie Mae and Freddie Mac are present values

[c] The tax and regulatory subsidies are the savings for the current year. The regulations are less stringent for GSEs than for other financial institutions. They are also exempt from corporate tax. The amount excludes the value of Freddie Mac's state and local income tax exemptions for 2003

[d] The subsidies passed through to mortgage borrowers are present values

Estimated at more than one billion dollars in 2003, the explicit subsidy accruing to Fannie Mae and Freddie Mac through the exemption from corporate tax and other financial concessions connected with the issue of securities can certainly not be neglected.

However, another estimated $18.5 billion (2003) appeared to be cashed in the form of two types of implicit subsidies, the lower interest rate on debt and the lower rate of return on MBSs. Both are related to the government guarantee that the market ascribes to Fannie Mae and Freddie Mac. They relate to estimated cost savings for Fannie Mae and Freddie Mac as a result of the general expectation that government will step in if there are problems.

Fannie Mae and Freddie Mac pay a lower rate of interest than other financial institutions for their debt: "their debt is selling better than AAA paper" (Lockhart III 2007, p. 10), meaning that the GSEs can fund more cheaply than other financial institutions (CBO 2001; Sanders 2002). The standard estimate according to Glaeser and Jaffee (2006) is that Fannie Mae and Freddie Mac pay 40 basis points less than comparable private borrowers on their debt. Therefore, Fannie Mae and Freddie Mac can offer a lower interest rate for their MBSs than other financial institutions.

These "lower-interest rate advantages" are based on an assumption in "the market" that the government will step in, if Fannie Mae and/or Freddie Mac get into financial difficulties. That said, the US administration does not formally act as guarantor for Fannie Mae and Freddie Mac—the market only assumes as much (Poole 2003). After all, Fannie Mae and Freddie Mac have become such crucial players on the secondary mortgage market that the government will not just stand back, if problems cropped up, is the general expectation:

"Despite the attempts of the U.S. Government to deny that such a guarantee exists, reasonable observers are not buying it" (Glaeser and Jaffee 2006, p. 2). The perceived government backing also affects the credit guarantee that Fannie Mae and Freddie Mac give to their investors buying the MBSs. They can offer that against a lower cost than a private SPV.

Table 2 also shows who benefits from these subsidies. Fannie Mae and Freddie Mac retain over one-third of the estimated subsidies ($6.2 billion). Part of that amount may be paid out to the shareholders.

Also, the management of Fannie Mae seems to have profited from retained earnings (OFHEO 2006, p. 1):

> By deliberately and intentionally manipulating accounting to hit earnings targets, senior management maximized the bonuses and other executive compensation they received, at the expense of shareholders.

More than two-thirds of the subsidy goes to the borrower/buyer via, for example, lower interest rates for the mortgages that are taken out. The effective rate of interest on mortgages taken in by Fannie Mae and Freddie Mac is, on balance, 18–25 basis points lower than on the jumbo loans (CBO 2001).

Even though there are benefits for the borrowers, there are also opinions that the subsidy is not sufficiently focused. Douglas Holtz-Eakin, the Director of the Congressional Budget Office, for instance told in his testimony entitled "Aligning the Costs and Benefits of the Housing Government Sponsored Enterprises" before the Committee on Banking, Housing, and Urban Affairs of the United States Senate on April 21, 2005 that Fannie Mae and Freddie Mac lag behind in comparison with the market as a whole in serving low- and moderate-income families and first-time buyers. The Financial Report for 2007 of Freddie Mac (2008) shows that the affordability goals and subgoals that HUD set here were being met.

However, according to again Douglas Holtz-Eakin the subsidy of the GSEs is not enough to really raise the rate of homeownership. The Federal Reserve Bank of Minneapolis apparently estimated that reductions of 200 basis points on the interest rates on the mortgages that GSEs finance would be required to raise the homeownership rate by 0.5%. There seems to be some truth in this point, as homeownership rates on average increased "only" five percentage points in 40 years, from 61% in 1960 to 66% in 2000 (Quigley and Raphael 2004).[2]

6 Is big beautiful?

Next to the discussion about the subsidization of the GSEs, a discussion has also been taking place about the question whether large organizations are not creating large risks (Bothwell 1996; Poole 2003).

It seems impossible that Fannie Mae and Freddie Mac quantify and hedge every single risk. If Fannie Mae and/or Freddie Mac were to run into problems, they could trigger financial instability in the capital markets, complete with knock-on implications for the US

[2] As title insurance was in place long before securitization started, it has been ascribed a vital role in the growth of homeownership and the real estate finance industry (Moody 2005, p. 57): "Title insurance enables a more efficient closing process for buyers, sellers, and lenders … it allows for the smooth transition of mortgage assets from the primary to the secondary market."

economy. This would be the result of their size coupled with the explosive growth in their debt-based financing coupled also with softer accounting and reporting requirements for GSEs than for comparable financial institutions.

The GSEs have turned into highly leveraged entities, because they had up until 2002/3 increasingly kept the MBSs on their balance sheet (on-balance portfolios) instead of selling them to investors, as Table 3 shows. Hedging the interest rate risk as a result of this debt position can be another source of financial instability, because it will make GSEs engage in procyclical behavior (De Nederlandsche Bank (DNB) 2003; International Monetary Fund 2003; Kambhu and Mosser 2001; OFHEO 2003). Such procyclical behavior is the direct consequence of the possibility that allows the US borrower generally to repay the mortgage loan at any time without a penalty. If the interest rate falls, the share of penalty-free prepayment of the mortgage loans will rise. In this situation, borrowers can get a loan with a lower interest rate than the rate for their original loan. The probability will also rise that the GSEs will have to re-invest the incoming cash at an interest rate which is lower than the interest rate they pay on their funding (debt). To avoid this risk, the GSEs apply strategies that result in higher interest rate volatility in the short run.

Another problem was reported in an OFHEO (2006, p. 1).

> A combination of factors led Fannie Mae senior management, through their actions and inactions, to commit or tolerate a wide variety of unsafe and unsound practices and conditions. Those factors included the Enterprise's enormous financial resources and political influence, the expectation that senior management could write the rules that applied to Fannie Mae, …

As a result, Fannie Mae had greatly understated its risks and its image of a low-risk company had been false (Glaeser and Jaffee 2006, p. 1). Also it had manipulated its profit and earnings per share "with the aid of inappropriate accounting and improper earnings."

A news release of OFHEO (2007a) states that in hindsight Fannie Mae had been undercapitalized most of the quarters in 2002–2004, but that it was adequately capitalized as of December 31st of 2006. OFHEO reaffirmed in the same text that Freddie Mac had been adequately capitalized in the first three quarters of 2006, and it turned out to be adequately capitalized also in the fourth quarter. But apparently the problems had not yet been solved completely as "both companies remain a significant supervisory concern" (OFHEO 2007b, letter accompanying the Report to Congress). OFHEO also states: "… significant work remains before … becomes a timely financial filer and corrects its internal control and operational weaknesses" (OFHEO 2007a, p. 2). The statement was made for both GSEs.

In 2008, both GSEs timely filed their financial statements (OFHEO 2008). They both were also adequately capitalized as of December 31st of 2007.

7 Effects of mortgage credit market crisis

7.1 Credit market crisis: result of underpricing of risks

Subprime lending has plunged the US credit market into trouble since mid-2007. It started off a domino effect: banks and other financial institutions in other parts of the world have also been hit, and the effects are being felt on the stock markets around the world. The economy of the US is considered unstable as a result.

Table 3 Total mortgages held or securitized by Fannie Mae and Freddie Mac in $ (in billions) and as percentage of residential mortgage debt outstanding, selected years 1984–2007

Year	Net MBS outstanding			As % of residential mortgage debt outstanding	Retained mortgage portfolio			As % of residential mortgage debt outstanding	Residential mortgage debt outstanding	As % of residential mortgage debt outstanding
	Fannie Mae	Freddie Mac	Total		Fannie Mae	Freddie Mac	Total			
1984	36	70	106		84	10	94			
1985	55	100	155		95	14	109			
1990	288	316	604	20.8	114	22	136	4.7	2,910	25.4
1995	513	459	972	26.0	253	108	361	9.7	3,735	35.7
2000	707	576	1,283	23.2	608	385	993	18.0	5,531	41.1
2001	863	653	1,517	24.8	706	504	1,210	19.8	6,124	44.5
2002	1,040	730	1,770	25.6	821	590	1,411	20.4	6,923	45.9
2003	1,301	752	2,053	26.3	920	661	1,580	20.3	7,793	46.6
2004	1,408	852	2,260	25.4	925	665	1,590	17.9	8,903	43.2
2005	1,599	974	2,572	25.6	727	710	1,437	14.3	10,036	39.9
2006	1,784	1,123	2,907	26.0	724	704	1,428	12.8	11,173	38.8
2007 Q1	1,849	1,178	3,027	26.6	713	714	1,427	12.5	11,382	39.1
2007 Q2	1,910	1,241	3,151	27.1	722	712	1,435	12.3	11,625	39.4
2007 Q3	2,001	1,309	3,309	27.9	724	713	1,437	12.1	11,841	40.1

Sources: OFHEO (2008) Market data on http://www.ofheo.gov/media/marketdata/EntShareRMDO90to07q3.xls; see also OFHEO (2007c), Appendix Tables 4 and 13

But what is subprime lending? Subprime lending is the result of the growth of risk-based pricing of mortgages at the high-cost end of the market. These mortgages are made to borrowers who for different reasons would not be able to take out a prime mortgage. The loans are perceived to have high credit risk, because borrowers do not fulfill credit history and down payment requirements. Subprime mortgages thus are more expensive loans for the borrower; the interest rate is typically two percentage points higher than for prime loans (Chomisengphet and Pennington-Cross 2006; see also Zelman et al. 2007).

Subprime lending became a rapidly growing segment in the mortgage market since the mid-1990s. Subprime purchase mortgage originations in dollars have since then grown by a factor of ten; the share more than doubled to approximately 23% of the total in 2005 (Wheaton and Nechayev 2006) and an estimated 20% in 2006 (Zelman et al. 2007). The subprime share of securitized purchase mortgage originations more than doubled in the period 2002–2006 reaching approximately 20%. The recent success of the subprime mortgage market pushed up the homeownership rate from 64% in 1995 to 69% in 2006 according to Wheaton and Nechayev (2006).

The subprime crisis can be (partly) ascribed to the information asymmetry that is introduced in the process as a result of separating the different functions in relation to mortgage loans (see Sect. 4.1): the credit risk takers more than likely will not be the loan originators. This may be regarded as one of the reasons that invited the easing of underwriting standards, not only for the subprime segment, but also in general for all loans when competition on the housing finance market increased (Lockhart III 2007; Zelman et al. 2007). In the non-agency subprime segment in 2006, half of the loans were so-called low-doc(umentation) loans, loans with incomplete or incorrect information on the income and the assets of the borrower. In the prime conforming loan market, the share of full-doc loans was almost 64%, while in the prime non-conforming market it reached about 45%. The types of loans in the subprime market are considered more risky as well than in the prime market. The share of fixed-rate mortgages (FRMs) in the non-agency subprime market in 2006 was less than 9%, while it made up 76% in the prime conventional market and about 57% in the prime non-conforming loan market. The more risky loans in the subprime market are mostly all kinds of adjustable rate mortgages (ARMs).

The alt-A segment of the mortgage market contains the medium-risk mortgages between the subprime and the prime mortgages. The interest rates of these mortgages, which reached an estimated 20% market share of purchase dollar originations in 2006, are lower than for subprime loans, but higher than for prime conforming loans. In recent years, this segment has evolved to include the risky mortgages according to Zelman et al. (2007). These included piggy-back loans (second mortgages) with high combined LTV ratios. The share of the negative amortization loans reached approximately 26% of all loans in this segment. For such loans, the initial interest payment is not enough to cover interest costs and the loan amount is increased. Other loan types also start in the beginning with so-called teaser rates which after a relatively short time frame of typically 2 years are recast to the then current interest rate level. Because of booming house prices the teaser rates and the recasting were not a problem. When teaser rates had to be changed into current market rates, households had already earned some housing equity, which could be used to refinance into a more affordable (prime) mortgage or to sell the house at a profit.

But when interest rates started rising in 2006 and house price appreciation slowed down (see also Lockhart III 2007 and OFHEO 2007b, c), this became a problem, also for borrowers with other ARMs. Monthly payments would quickly become unaffordable. Also because of the cooling down of the housing market, houses could no longer be sold with a profit and when house prices started decreasing, problems increased. In the late fall of

2006, the subprime market started contracting and lenders started to tighten underwriting standards.

In the end "reckless" underwriting behavior had the result that the risks of subprime, but also other mortgages were underestimated and that the (subprime) mortgages actually turned out to have been underpriced. According to Lockhart III (2007, p. 3) "bad models including banks' models, investors' models, and certainly the rating agencies' models … based on incomplete data" have contributed greatly to the underpricing of risks of mortgages.

The results are well-known: growing numbers of foreclosed properties and growing credit risks lead to increasing credit losses, higher provision for credit losses and increasing write-offs (losses) in the fair or market values of assets and debts (see also Freddie Mac 2008). These developments are not confined to the subprime market (Zelman et al. 2007).

The domino effect affecting the mortgage credit market results from the transformation of loans into securities which are either held in portfolio or sold off to investors and which are also used for creating other (complex) financial products for hedging risks, for example (see Sect. 6). Securitization turned out to be a non-transparent system, where the placement of risks is concerned. When the credit crisis started in 2007 no one actually knew when and where losses would show up. Trust disappeared from the mortgage market, resulting in the drying up of credit for the financial institutions.

In order to provide liquidity to the mortgage market and to restore trust, the Federal Reserve System (the Fed), the US central bank system, has supported the mortgage credit market in different ways: interest rates have been lowered several times and lending facilities have been offered to financial institutions for limited periods of time against attractive interest rates (www.federalreserve.gov). The aim of the interventions was to make funds available to the credit market and probably more implicitly to keep financial institutions on their feet.

7.2 Credit market crisis and GSEs

It is clear that the crisis on the credit market is connected to the system of securitization and the financial products and derivatives linked with it. The crisis is bigger than Fannie Mae and Freddie Mac alone. The GSEs still invest mostly in the prime conforming conventional mortgage market. As Table 1 shows, when the subprime and alt-A segments in the mortgage market started quickly growing in this century, the GSEs lost share in the new issues of RMBSs to private labels (see also Zelman et al. 2007).

The GSEs limit in principle their exposure to high-risk loan types. In 2006, they also moved away from subprime mortgages towards alt-A and A-[3]mortgages (OFHEO 2007c). Early 2007 Freddie Mac indicated that it would implement stricter investment standards for certain subprime ARMs originated after September 1, 2007. Zelman et al. (2007) reports that Freddie Mac was going to stop buying subprime ARMs that qualify borrowers at the teaser rate.

Nonetheless, Fannie Mae and Freddie Mac must stand in for their guarantees and take credit losses, and they have to take losses on their fair value items on their balance sheets. The fourth quarter of 2007 indeed brought record losses of $3.6 billion for Fannie Mae[4] and $2.5 billion for Freddie Mac.[5] For the year 2007, the net losses of Fannie Mae

[3] "…loans made to borrowers with slightly impaired credit" (OFHEO 2007c, p. 24).

[4] http://www.fanniemae.com/ir/pdf/sec/2008/form10k_newsrelease_022708.pdf;jsessionid=NLG1QNB3XPMNDJ2FECHSFGI

amounted to $2.1 billion or $2.63 per diluted share; for Freddie Mac $3.1 billion or $5.37 per diluted share.

At the same time, the GSEs have been obliged to buy more loans, as Table 1 shows. The demand for private label securities has halved in the third quarter of 2007. The GSEs do have the task of providing liquidity to the mortgage credit market. According to Lockhart III (2007, p. 7) the GSEs "are the key buyers of the refinanced subprime loans made to people with better quality credit that are now getting out of subprime." They have also raised almost $14 billion in preferred stock and reduced dividends in order to conserve capital. Furthermore, they were intending to raise their fees, not only the risk premiums on guarantee fees.

Other initiatives are that Freddie Mac has been helping nearly 47,000 families to avoid foreclosure through the purchases of approximately $43 billion in conventional conforming product originations to borrowers who otherwise might have been limited to subprime mortgages.[6] Fannie Mae is temporarily buying loans with higher loan limits than the conventional ones.[7] As the temporary GSE loan limit has been signed into law by the president, it will most probably also be applied by Freddie Mac.[8]

On March 19th of 2008, OFHEOs news release was entitled "OFHEO, Fannie Mae and Freddie Mac announce initiative to increase mortgage market liquidity."[9] The new initiative reduces the OFHEO-directed capital surplus of 30% above the minimum to 20%. It is expected that up to $200 billion of immediate liquidity becomes available to the secondary mortgage market.

8 "What to do about Fannie and Freddie?"

The title of this section is borrowed from Glaeser and Jaffee (2006, p. 1) who wonder what can be done with the value of the implicit government guarantee to Fannie Mae and Freddie Mac, the so-called GSEs. The implicit guarantee is considered by many as the real driver behind the success of Fannie Mae and Freddie Mac. Together with their regulation it resulted in the hybrid status of Fannie Mae and Freddie Mac. The results are cost savings in the form of implicit and explicit subsidies, some of which are passed on to the homebuyers, but the management and the shareholders of the GSEs also benefit: the hybrid character of Fannie Mae and Freddie Mac thus goes a long way. This observation is supported by the fact that the markets for CMBSs (commercial MBSs; mortgages on non-residential property) and for RMBSs that are non-conforming have long been less successful than the one that Fannie Mae and Freddie Mac are operating in, the market for conforming mortgage loans.

Thus, the "best housing finance system in the world" was not born through a market miracle, but through regulation in combination with the existence of a supposed government guarantee. The debate in the US therefore revolved around the question of how far the implicit (guarantee) and explicit (soft conditions) subsidies are creating unfair competition on the secondary mortgage market. It was also a question of whether hybrid

[5] http://www.freddiemac.com/news/archives/investors/2008/2007er-4q07.html

[6] http://www.freddiemac.com/news/archives/investors/2008/2007er-4q07.html

[7] http://www.fanniemae.com/media/statements/2008/030608.jhtml?p=Media&s=Statements

[8] http://www.fanniemae.com/media/statements/2008/021308.jhtml?p=Media&s=Statements

[9] http://www.ofheo.gov/newsroom.aspx?ID=422&q1=0&q2=0

organizations should continue to implement securitization—is this the most efficient and effective way?—once the original objective had been achieved: namely, to generate enough capital for the mortgage market in order to avoid a re-enactment of the huge shortages in the 1930s and 1970s. Hence, the question became: now that Fannie Mae and Freddie Mac have outlived their original purpose, is all that is left a complex system to provide homebuyers with a small reduction in the mortgage interest rate?

Before the discussion seemed to be brought to an end, the so-called subprime crisis started on the mortgage credit market in 2007. The GSEs may not be as hard hit as some other financial institutions, as they have largely remained with their core business, buying prime conforming loans, but their losses have been reaching new records in 2007. They are also expected to provide liquidity and stability to the mortgage credit market. They are making efforts to do so, probably getting bigger again in the process, again taking advantage of their position.

The question remains whether these efforts which are supported by OFHEO, their regulator, will be financially sound for the future. Also the question remains whether the benefits that the GSEs provide for the mortgage credit market outweigh the costs. Also one may wonder what they could achieve by themselves without the initiatives that the Fed, the US central banking system, is taking to support the credit market. The answers to these questions are for politics to decide. As Fannie Mae and Freddie Mac are powerful lobbyers, the outcome of these debates will be uncertain.

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