

The Future of US Housing Finance: Why a Competitive Market Oriented Housing Finance System is Still the Best

Kevin Villani

November 2010

Abstract

The US system was a unique market/government hybrid that produced excessively risky loans funded with too much leverage, resulting in the systemic collapse of the global financial system. The responsibility for the massive failures of both the private securitization and public government sponsored enterprise (GSE) models falls directly on regulators and indirectly on their political overseers. Private and GSE prudential regulators were given political social goals and the GSEs and to a lesser extent the “too-big to fail” (TBTF) commercial and investment banks wielded excessive political influence. We find no evidence that the US has unique characteristics requiring a hybrid GSE approach, and no reason to believe that any approach that does not safeguard prudential regulation from political influence by separating subsidy from finance and eliminating regulatory arbitrage will not result in a subsequent systemic failure.

Kevin Villani is former SVP/acting CFO and Chief Economist at Freddie Mac and Deputy Assistant Secretary and Chief Economist at HUD, as well as a former economist with the Federal Reserve Bank of Cleveland. He was the first Wells Fargo Chaired Professor of Finance and Real Estate at USC. He has spent the past 25 years in the private sector, mostly at financial service firms involved in securitization. He is currently a consultant residing in La Jolla, Ca.

Introduction

In the aftermath of the sub-prime lending bubble of 2005-2007 and subsequent systemic collapse of the global financial system, the US housing finance system remains on federal government life support with approximately 19 of every 20 new mortgages government funded. The current policy question is what sort of housing finance system should the US have after the economy and financial markets fully recover?

While contemporary housing finance systems evolved differently and vary significantly among countries, they fall into two broad categories: “market oriented” or “government-driven.” Not surprisingly almost all highly developed market economies have publicly regulated market oriented systems--some with limited government sponsored mortgage insurance--whereas many developing countries have government-driven systems.

The essential distinction between the US model of housing finance and those of other market economies had their origins in FDR’s response to the financial crisis of the Great Depression. Government sponsored deposit insurance and later government sponsored enterprises (GSEs) to create secondary mortgage markets sowed the seeds of a system with more widespread albeit largely implied saver and investor protection, increasing the potential for “moral hazard”--the incentive to take greater risks--that would nominally require a more protected and regulated financial system. This evolved into the hybrid deposit/capital market model of the 1970s for essentially two reasons. First, the somewhat unique state/federal political structure of the US and the advanced development of capital markets necessitated greater reliance on secondary or “wholesale” than primary or “retail” deposit market funding. Second, the privatization of Fannie Mae and Freddie Mac resulted in their exploitation of their prior government sponsorship for private gain.

Elliot and Baily (2009) note that the narrative chosen to explain the sub-prime lending debacle will determine the policy prescription, and present three alternatives which may be summarized as: 1. Government-induced distortions from protection and regulation, 2. “Wall Street” greed, and 3. “market failures” and government cures.

The greediness of money center commercial and investment bankers and traders, particularly those who short stock, has always been the choice of politicians and has motivated financial legislation from Glass-Steagal to Dodd-Frank. Nobody disputes their chronic greediness, but there is no economic theory as to how this leads to systemic failure except as induced by government distortions, and no market economy has yet attempted to do away with its bankers.

The policy prescription implied by the first narrative is a return to the publicly regulated competitive market oriented model of an earlier era in the US, common to developed economies today. The policy prescription implied by the second and third narratives is a return to the hybrid US model of the past several decades with presumably more and better regulation

of GSEs. So the essential policy decision is whether or not to re-incarnated Fannie and Freddie in some form.

The market failure narrative fits the *assumptions* of classical economics, i.e. that markets fail on their own and are amenable to government intervention to correct for such failures. This is the current theory behind Fannie Mae and Freddie Mac, that it fixed a “market failure” apparently not fixed by various anti-discrimination and redlining laws by establishing quotas for social lending. The expanded narrative is that government protection through the FDIC and these two GSEs reduce systemic risk and in addition produce a variety of “positive externalities” including cheap fixed rate mortgage credit.

The theory behind the first narrative—that government distortions of a sufficient magnitude can create a “moral hazard” of excessive risk taking—is sufficiently robust to explain why homebuyers would take out mortgages they almost certainly knew they couldn’t repay, why loan originators would make such loans, why creditors and equity investors would fund them, and why this could be done on a systemic scale before collapsing and bringing down the global financial system, leaving a totally government dominated system in its wake.

We go back to the Depression era origins of deposit insurance and GSEs and trace their subsequent evolution, finding little in this history to support the third narrative. Social lending quotas were unnecessary to make credit available to qualified borrowers, and were eventually expanded to include a large pool of unqualified borrowers, the losses from which are the root cause of the sub-prime lending debacle and systemic collapse of the financial system.

The evidence that enormous regulatory distortions relating to both banks and GSEs caused the systemic sub-prime lending bubble is overwhelming. We also find compelling evidence that Fannie and Freddie led rather than followed the private label MBS market over the cliff, but view that debate as a diversion from the central policy question. Private securitization failed partly because of political influence but mostly due to regulatory incompetence that must be remedied in any event if deposit insurance is to be retained.

The perceived benefits provided by Fannie and Freddie mostly stem from unbudgeted implicit subsidies or highly questionable or relatively miniscule positive externalities of government intervention. GSE proponents all ignore the costs and distortions, assuming that they can be strictly controlled with regulation and pricing. This is sheer folly. The problem with keeping Fannie and Freddie in some form as well as with the various proposed alternative capital market hybrids that seek to limit and/or price government backing is that policymakers have always done just that! It was investors, not policy-makers, who conferred “agency status” *ex post* in spite of the prior ill conceived privatizations of Fannie and Freddie. They serve only political purposes and hence their regulatory failures were an entirely predictable and predicted result of an inherent politization of regulation.

We therefore reject re-incarnation and hybrid models and conclude with recommendations as to how to restore a competitive market oriented system common to other market economies.

The Depression Era to 1970

The parallels between the Great Depression and the Great Recession are striking. Economists are still split regarding the causes of the Great Depression and the effectiveness of the policies to end it. One narrative (3) is that the private market failed and the mortgage GSEs road to the rescue, particularly for housing and home borrowers. The other is that public policies, particularly the financial market intervention of the newly implemented Federal Reserve System (Fed) caused and prolonged the systemic collapse and the introduction of FHA insurance and the Fannie Mae secondary market facility did little if anything to speed the recovery of the housing market. The protection provided by the FDIC and Fannie Mae sowed the seeds of future “moral hazard” that posed an additional systemic risk.

The Federal Reserve Act of 1913 created the nation’s third central bank to provide the commercial banking sector with systemic liquidity support, thereby mitigating the likelihood of banking panics. The Fed’s mandate was limited to providing cash against sound marketable collateral to commercial banks, and beyond in emergencies. This system got off to an inauspicious start. The 1913 Federal Reserve Act introduced the first moral hazard, and soon thereafter the Fed was accused of fueling the asset bubble of the 1920s. According to Johnson (2010, pg30):

“Not only did the Federal Reserve’s System encourage excessive risk taking by bankers, the safety net, it turned out, had gaping holes that could not be fixed in the intense pressure of a crisis. The result was the Great Depression.”

Housing prices skyrocketed and production boomed in the 1920s, more than doubling from 1921 to 1925. While tailing off some, 1928 production was still up almost 70% from 1921. It then crashed hard, falling by over 80% from 753,000 units in 1928 to 134,000 in 1932. Housing was not the only bubble to burst, but it was a major one.

Unemployment rose to 25% as GDP fell by a similar magnitude. The resulting loan default was devastating for most financial institutions, particularly the small local or regional banks and savings and loans least able to diversify from the crash of agriculture and housing markets due to regulations limiting or prohibiting branching. Foreclosure sales in a weak market sent house prices spiraling down well below replacement cost as there were few if any buyers. Thousands of smaller banks and thrifts failed as a result, with little left for depositors in the aftermath.

Not all banks and thrifts were technically insolvent, but it was virtually impossible for depositors to discern the distinction. The best strategy, available to bank but not thrift depositors because unlike demand deposits of banks their deposits were not callable, was to be first in line to withdraw funds prior to making such a determination. It fell to the Fed to make the distinction, providing sufficient liquidity to stem runs on solvent banks only.

Bank runs were nothing new, and a not very efficient way of determining which were insolvent and which merely illiquid. Political proponents used the Depression (“a crisis is a terrible thing to waste”) to push their long standing agenda of deposit insurance through (Calomiris and White, pg 146), the lack of which was neither a cause of the bank runs nor of the Great Depression

(Friedman, 2008, pg 166). FDR and bank regulators had opposed public deposit insurance due to concerns with moral hazard, so Congress attempted to mitigate this risk by limiting the insurance to small depositors. In addition, it rejected having the US Treasury directly insure deposits in favor of an off-budget federally *sponsored* self-funding enterprise, the Federal Deposit Insurance Corporation (FDIC).

Savings and loans refused to join as they had not been subjected to the same runs and hence they would be forced to subsidize commercial banks.¹ They got an independent savings and loan counterpart Federal Savings and Loan Insurance Corporation (FSLIC) two years later in the National Housing Act of 1934, thereby avoiding the cross-subsidy.

The system of savings and loan liquidity nevertheless was weak in spite of their deposit call protection because commercial banks had access to the Fed but only if solvent, so many systemically defaulted on their lines of credit to savings and loans. The proposal to allow savings and loans access to the discount window at the Fed was rejected at the time (but was subsequently changed in 1989).² Instead, an independent enterprise, the Federal Home Loan Bank (FHLB) System, was established by the Hoover Administration in 1932 to provide liquidity directly to savings and loans by discounting home mortgages, i.e. providing advances against collateral at less than par value (called a “haircut”) and with full recourse to the borrowing institution. The FHLB advance program of 1932 was analogous to central bank discount lending liquidity facility but without the stigma of signaling distress, with a more liberal collateral requirement and with significantly longer terms, all of which could promote homebuilding and employment. The FHLB System had authority to borrow up to \$215 million from the US Treasury in emergencies, but it generally relied on capital market access for funding.³

The savings and loan model, by now over two hundred years old and with over one hundred years of experience in the US, had worked fairly well to this point. Loans were rolled over every five to ten years, at which time they were re-priced to the current market interest rate. During the Great Depression this resulted in reducing the payment to reflect deflation and falling rates, mitigating default to some extent. So long as the borrower was current and remained credit-worthy and the lender remained solvent—two major contingencies during the Depression—roll-over was relatively automatic. Borrowers repaid principal by contributing monthly to a sinking fund—the common practice of the time—to avoid requiring borrowers to make a balloon payment.

But no system could have survived the systemic credit default debacle of the Great Depression unscathed. Prior to the resolution process later established by the FDIC and later the FSLIC, liquidating banks and thrifts was particularly traumatic for both borrowers and savers, as there was virtually no market for current or distressed loans. The federal government needed to

¹ Calomiris and White (1994) note that large banks opposed the cross subsidy to the small banks, more likely to fail due to branching restrictions.

² See Bodfish, Morton and A.D. Theobald, Saving and Loan Principles, Prentice Hall, New York, 1940 for this discussion.

³ The Fed had the ability to purchase FHLB securities and in that way provide systemic liquidity, but it was not obligated to do so.

address the problem of mortgage borrowers, particularly at failed S&Ls and especially for those whose loans were current and due to be rolled over. The Homeowners Loan Corporation (HOLC) was established under the FHLB System to among other things implement the government's Depression era forbearance programs. The primary approach was to refinance credit worthy borrowers with a long term mortgage that replaced the roll-over provision with a long term to maturity and the sinking fund with a more efficient and portable amortization schedule.⁴

The Hoover Administration programs addressed the financial system, but housing demand fell much faster than supply during the Great Depression in spite of plummeting housing construction levels from 1928-1932 due to doubling up, conversion of large to multiple smaller units, etc. so that the vacancy rate rose by over 60%, from 8% to 13% (Colton, 2002, pg 2). The demand for mortgage credit plummeted commensurately. The incoming FDR Administration chose to interpret the problem as one of limited mortgage supply reflecting the banking crisis. Hence all the Great Depression Era housing programs were focused on financing new construction to stimulate jobs, as they had been since the previous century (Congressional Research Service (CRS), 1966, pg A1).

The National Housing Act was passed in 1934 with the stated intent of promoting homebuilding and construction jobs.⁵ It established the Federal Housing Administration (FHA) as an independent *mutual* mortgage insurance fund authorized to insure one type of mortgage only, the long term (up to 20 years) fully amortizing fixed rate mortgage (frm) then being used by HOLC, with a maximum loan to value ratio of 60%.

Portfolio lenders had no need for the default insurance on loans with a 40% cash down-payment so activity was sparse. The National Housing Act Title III gave FHA the authority to establish private national mortgage exchanges to make a market in these FHA mortgages and thereby promote its use, but all attempts failed as S&Ls could now discount mortgages at the FHLB and there was no market demand to sell (or buy) mortgages on a national exchange. FDR sought input from the National Association of Home Builders, the Mortgage Bankers Association of America, the National Association of Real Estate Boards, and the United States Savings and Loan league among others on ways to promote FHA, and in 1935 established the RFC Mortgage Company with \$10 in million in capital to buy and sell FHA loans limited to financing *new residential construction only*. In February 1938 it amended the National Housing Act to have the Federal Housing Administrator (FHA) create the National Mortgage Association of Washington, later changed to the Federal National Mortgage Association (FNMA) or Fannie Mae to replace RFC, removing the restriction to new construction to spur FHA market acceptance.

There were numerous subsequent amendments to the Fannie Mae Charter over the next 30 years but the basic structure was not changed. It was legally a wholly owned self-funded government corporation with three functions, the "private" secondary market function and the "public" special assistance and management and liquidating functions. The secondary market function was limited to that of a broker/dealer rather than a wholesale housing bank, with

⁴ HOLC was liquidated in 1951 at a small profit (CRS, 1966, pg3).

⁵ The stated intent of the 1934 Act was to stimulate construction (Colton,2002, pp. 4-5)

dealer inventory funded and backed exclusively by the corporation's resources with private debt. The US Treasury funded the public functions with loans and provided an emergency liquidity backstop similar to that of the FHLB System or Fed.

The S&L mortgage lending industry had opposed the creation of Fannie Mae on grounds that it represented the potential encroachment of a government housing bank into their market, more so with the removal of the limitation to new construction. Assuaging this concern was the fact that Fannie Mae was explicitly limited by charter to investing only in FHA insured loans that S&Ls didn't want to hold anyway. Moreover, all of the charter language required selling in equal proportion to buying, and in addition the Charter limited debt to ten times capital and even then only with prior Treasury approval, mitigating concerns with a portfolio competitor.⁶

An analysis of whether current Fed Chairman Bernanke's assertion that Fed policy caused and prolonged the Great Depression is beyond our current scope. The FDIC did not require any direct federal bailouts during this period, but as early as 1933 when FDR reopened the banks the markets perceived the federal backing of deposit insurance as complete, and in this they were prescient (Silber, 2009, pg20). The bankers apparently did as well, as bank capital levels fell steadily from over 16% of assets when deposit insurance was first introduced to only 5.5% by 1945, where it stayed for the over four decades before falling further in response to risk-based capital regulations. FHA and Fannie Mae didn't assist the housing recovery but grew in the post war period largely as a result of funding VA loans for returning WWII veterans during the 1950s baby boom. Total debt was about \$6 billion by the time Fannie Mae was privatized in 1968, about two thirds of which was a direct liability of the Treasury to finance its public mission with most of the corporately funded secondary market activity reflecting VA loan purchases.

The Benefits and Risks of GSE Mortgage Securitization 1970 to 1990

Mortgage securitization originated in the US and remains a largely US practice because its origins reflected the unique need for a national secondary market that got around the conflict between state and federal laws and regulations. Other countries have been slow to adopt the practice primarily because credit risk is difficult to transfer to wholesale capital market investors due to moral hazard concerns with the originator, a problem historically solved in the US mostly by relying on primary mortgage insurers that maintain a retail underwriting presence. But an important if accidental byproduct of securitization is the efficiency with which it transfers virtually all of the interest rate risk of fixed rate pre-payable mortgages to investors. The seemingly anomalous result is that systemic interest rate risk—primarily government in origin—is passed on to private investors whereas systemic credit losses--also primarily government in origin—are sometimes been passed back to taxpayers.

Origins of GSE Securitization

⁶ Mortgage bankers became Fannie Mae's only clients as they gradually sold to it rather than directly place loans with investors, typically life insurance companies for fixed rate loans..

The 1964 Housing Act that provided authority for Fannie Mae to issue participation certificates on pools of mortgages held as a consequence of the special assistance and management and liquidating functions was designed to get these assets off the government's balance sheet and reduce the deficit (CRS, 1966, pg 44) by treating the securitization as a sale rather than a financing. The authority wasn't used but Fannie Mae was subsequently "privatized" in the 1968 Housing Act signed by President Johnson as an accounting gimmick to reduce the stated deficit with little thought given to the long term consequences of the structure of the privatization.

The Government National Mortgage Association (GNMA) or Ginnie Mae was established by the same 1968 Act to "manage and liquidate" the public Fannie Mae portfolio. It subsequently pioneered the so-called "pass-through" (PC) security 1970 after the newly privatized Fannie Mae rejected the securitization concept to finance the secondary market facility.⁷ Its name derived from the fact that by law the underlying "grantor trust" passed through *all* of the cash flow from the mortgages with the lone minor exception that it could advance the typically delayed FHA insurance reimbursements in the event of borrower default. The necessity of the IRS exemption stemmed from the long held Treasury position that all *revenue* to a trust is taxable at the corporate tax rate as *net income* or profit. The "grantor trust" was exempt from corporate tax because this trust was by law *passive* and all the cash was required to be passed through to the beneficiary. Treasury thus gave Ginnie Mae a written limited waiver based on the insignificance of the modification of the passive cash flow to a guaranty of "timeliness," hence the name "pass-through" certificate or PC.⁸

Investors initially rejected the Ginnie Mae PC--as they had other government designed financial "innovations"--as unnecessarily complex and extremely difficult to analyze and administer, with totally unpredictable cash flows. But its merits were entirely associated with bypassing political constraints as Ginnie Mae securities were treated as federal government issues with a complete federal pre-emption of all conflicting state and federal laws and regulations that, among other things, would have required separate security registrations in all fifty states for each offering. The failure of Depression era financial legislation to address fundamental causes of the banking crisis—one being small undiversified banks and thrifts (S&Ls and savings banks) protected from competition by branching restrictions—now became a much bigger problem as young borrowers moved across states and regions leaving older savers behind. Mortgages were being actively sold as whole loan transactions--typically with recourse to the seller or with a seller junior participation--in significant volume both because banks couldn't branch and because retirement savings grew faster in wholesale institutions than bank (and thrift) deposits in retail institutions. S&Ls had previously addressed this by competing for deposits across states and regions primarily by offering higher rates through mail advertising, but deposit rate controls put a stop to this in the mid-1960s.

⁷ Sherman Maisel, Vice Chairman of the Federal Reserve at the time, developed and promoted the concept.

⁸ Each Ginnie Mae security is a "grantor" trust. Parenthetically, Ginnie Mae's website now boldly proclaims "The only mortgage backed security that enjoys the full faith and credit of the United States Government."

Hence investors eventually bought the securities in spite of its undesirable traits and the specific prohibition against Ginnie Mae guaranteeing the *credit risk* because these tax and regulatory benefits far out-weighed the instrument's inherent drawbacks and filled a market void.⁹In essence, Ginnie Mae stamped the securities "exempt from regulation" which allowed the securities to be issued and left the rest of the process up to private originators and investors, a politically enabled form of regulatory avoidance or "arbitrage".

Having a government agency, Ginnie Mae, finance FHA loans was essentially a return to the original RFC approach of 1935 and Fannie Mae approach of 1938. The big difference is that it was no longer limited to new construction as was RFC or to financing for dealer inventory as was Fannie Mae, which gave the mortgage bankers that created Ginnie Mae pools a big advantage over S&Ls. The S&L industry opposition to this was dampened in 1970 with the offer of their own exclusive (albeit still public) secondary market entity, the Federal Home Loan Mortgage Corporation (FHLMC) or Freddie Mac to deal in conventional mortgages.

Freddie Mac soon realized that S&Ls had no use for a broker/dealer in conventional loans and closed its struggling AMINET broker dealer. When this system failed to develop a demand among its portfolio lending clientele the then CEO Tom Bomar recommended liquidating the young agency as the prior Chairman Preston Martin had promised the Congress during his testimony supporting the agency's creation. Instead, they adopted the Ginnie Mae mission, rationale, technique and regulatory exemption, but serving S&Ls instead of mortgage bankers and privately insured conventional mortgages instead of FHA and VA loans. They began purchasing fixed rate mortgage loans to finance with participation certificates, also called PCs. Freddie Mac initially purchased senior 95% participations, and fortuitously loans with a loan-to-value greater than 80% had to have private mortgage insurance down to 75%.¹⁰ Freddie Mac limited its activity to conventional fixed rate loans to allow S&Ls to reduce interest rate risk by selling these while keeping adjustable rate loans on which they could still earn a reasonable spread. It then securitized conventional mortgages in essentially the same PC security format used by Ginnie Mae to securitize FHA/VA mortgages. In spite of Freddie Mac's status as a public (FHLB System sponsored) entity, its disclosures also warned that defaults on the underlying mortgages and securities were not backed by the US Treasury.

Risk Exposure of Ginnie Mae and Freddie Mac Securitization and Fannie Mae Debt

The public's risk exposure to securitization in the 1970s and 1980s was still legally and substantively minimal and subject to complete political control. Freddie Mac was off-budget but controlled by political appointees of the Federal Home Loan Bank Board and under the

⁹ FHA is an independent mutual insurer but was placed under the department of Housing and Urban Development by the 1968 Act. The Treasury doesn't guarantee FHA, but the Secretary of HUD is the prudential regulator. Congress has never appropriated funds to back the insurer, but markets (and apparently Ginnie Mae (see footnote 8) assume it would based on this regulatory responsibility.

¹⁰ James Horn, a former aid to Senator Sparkman when he headed the Finance Committee, was asked to lobby the bill establishing Freddie Mac through the congress. He agreed, but only with the proviso that private mortgage insurance be required. He was a CEO of a Boston based insurer at the time, but the requirement stood on the merits and dramatically reduced the public risk exposure.

leadership of CEO Ken Thygerson maintained a policy of passing through virtually all interest rate risk to investors. Ginnie Mae is a government agency, but the securities it guarantees are off budget because it didn't guarantee the credit risk of FHA/VA mortgages, which were likewise off budget because they were backed only by an independent "sponsored" mutual insurance fund. It was thus exempt from the control of the Federal Financing Bank, the Treasury's agent for that responsibility, but was subject to annual Congressional approval of guarantee limits as well as ongoing HUD oversight.

By 1980, Ginnie Mae and Freddie Mac had over \$100 billion in PC's outstanding. Ginnie Mae probably increased FHA's share of the (qualified, by loan limit) mortgage insurance market dramatically, arguably increasing the government's credit risk exposure as its GSE funding advantage was huge. Freddie Mac's guarantee arguably didn't increase the public's credit risk exposure, as the loans were previously funded by FDIC insured deposits in any event and those with an initial loan to value ratio above 80% had private mortgage insurance coverage. But credit risk remained extremely low due to soaring house prices. In addition, both Ginnie Mae and Freddie Mac passed on to investors all interest rate and pre-payment risk, which was the dominant risk of the time. Hence Freddie Mac and Ginnie Mae (and FHA/VA) were in good shape.¹¹

FHA and Ginnie Mae minimized the moral hazard risk inherent in the originate-to-sell model in three ways: First, FHA maintained local underwriting offices, second, Ginnie Mae required an excessive servicing fee, postponing some of the origination profit to the end of the loan which was lost in the event of default due to foreclosure expense borne by the servicer (see Hendershott and Villani, 1994), and third, Ginnie Mae had full recourse which cross-collateralized all securitizations, thereby putting a PC originator's entire profitable loan servicing business and capital at risk for a failure to perform on any individual pool. Freddie Mac was historically more protected against this moral hazard by relying on private mortgage insurers who also maintained local underwriting review and by dealing with better capitalized portfolio lenders rather than mortgage brokers and bankers where the moral hazard risk of whole loan purchases of conventional loans remained substantial.

Fannie Mae's risk management strategy at this time contrasts sharply with Ginnie Mae and Freddie Mac. The mortgage bankers were "given" Fannie Mae when it was privatized as a consequence of the share subscription when selling its loans--really a fee to access the facility. But Fannie didn't really have a purpose once the Ginnie Mae PC got going and took over FHA/VA funding. Had the Ginnie Mae pass-through function been contemplated in 1968 there would have been no rationale to "privatize" the secondary market function rather than simply liquidate it. Having missed that opportunity, this new privatized entity then sought and obtained a charter change to allow it to purchase conventional loans which it funded as cheaply as possible with short term debt to raise the purchase price. This borrow short-lend long portfolio lending

¹¹ FHA became technically insolvent in the 1980's and was reorganized, but didn't require a budget transfer.

strategy resulted in technical insolvency by the end of the 1970s for Fannie Mae, just as it did for S&Ls.

The Role of FHA and Private Mortgage Insurance

Private mortgage insurers (PMIs), bankrupted by the Great Depression but reincarnated in the 1950s, have since been the primary risk filter for conventional loans with less than 20% down-payments for the originate-to-sell system of funding, as FHA is for qualifying loans in its market segment. While the down-payment requirement for conventional loans has remained relatively constant, FHA insurance minimum down-payment requirements were gradually lowered from 40% initially until they were eventually eliminated.

FHA and the PMIs both “assure” risks with *ex ante* risk mitigation measures to minimize the moral hazard associated with insuring borrowers with little or no equity at stake, and “insure” remaining risks through diversification. The fundamental principle of insurance is that the remaining credit risk can be diversified and actuarially priced based on the uncorrelated nature of default risk among the individual loans in a pool. A lender’s risk is reduced in two ways. First, FHA covered a lender’s entire loss, the VA the top 20% and PMI the top 25%. These differences were generally insignificant as loans not fraudulently underwritten rarely resulted in losses greater than 20%-25% during normal times. Second, both FHA and the PMIs maintained a local underwriting presence and rigorous underwriting guidelines. Third, they both avoided correlated risks. HUD regulated the actuarial soundness of FHA and state insurance regulators did the same for the PMI monoline insurers.

An alternative theory to insurance is that each mortgage borrower has a “put option” to default (in finance parlance, “put” the loan back to the lender at par). Insurance underwriting was based on the premise that borrowers would pay if they could. The distinction is that “put option” risks are all correlated to falling house prices and assumes borrower default even if the borrower has the capacity to pay.¹² Other countries avoid this problem by allowing recourse to the borrower, outlawed in 27 states in the US and not enforced in the rest. Such loans are uninsurable, i.e. they would bankrupt a monoline insurer if all loans were put back at once. In essence, PMIs could diversify default risk but not political risk (systemic risk of political origins), and virtually no amount of private capital could back the presumed “out of the money” put options of a systemic risk such as deflation of house prices. Hence no counterparty would accept PMI coverage of such a put option. Private mortgage insurers continued to insure throughout the 1980s in any event as there was little evidence of the “put” option motivating so-called “strategic” defaults when a borrower’s equity became negative.

The HUD Report on the future of the FHA written at the tail end of the Ford Administration argued that with the reincarnation of the PMIs this government sponsored fund was no longer needed. But that report was never sent to Congress and a new report was written in the early

¹² The now extensive literature on the put option in mortgage contracts was spawned about a quarter century ago by Robert Van Order, then Freddie Mac Chief Economist. See Chet Foster and Robert Van Order, 1984, for the first discussion of default as an option.

days of the Carter Administration that argued that FHA was the proper tool for addressing “under-served” markets, should they exist. The prior 1970s failure of FHA’s special risk insurance fund was enough to convince FHA actuaries that “insurance” was not an appropriate vehicle for delivering subsidies to high risk borrowers in the so-called “underserved” markets as “adverse selection” will inevitably bankrupt a monoline insurer. Adverse selection refers to the process whereby lenders attempt to accept more risk but adequately price it by charging risky borrowers a higher premium. The first problem is they get more risk than they bargained for, as the best of the more risky borrowers find cheaper loans. The second problem is that charging risky borrowers more is considered discriminatory by some and generally discouraged by politicians.

Portfolio lenders face the same moral hazard risks, adverse selection and systemic risk as primary mortgage insurers. The difference is that private monoline insurers regulated by public insurance commissioners have no way to cross-subsidize these risks or pass them through to taxpayers. But FHA, Fannie Mae and Freddie Mac were all regulated by a social agency (HUD) and due to their agency status didn’t face a bankruptcy constraint even when actuarially insolvent.

FHA accused the PMIs of “cream skimming,” i.e. leaving FHA with an insufficient pool of strong borrowers to cross-subsidize the weak “under-served.” The Ginnie Mae PC saved the FHA insurance fund by basically giving FHA a monopoly pricing advantage in the qualifying loan market-- charging only 6 basis points (.06% of principal) annually for agency status conferred on Ginnie Mae mortgage backed securities (MBS)—facilitating a cross-subsidy to weaker credits.

Just as the deflation that raised the real payment burden combined with systemic unemployment bankrupted the private insurers in the Great Depression, the inflation of the 1970’s bailed them out, as well as FHA. But credit risk was a concern for the insurers in the 1980s as house prices were relatively stagnant. The PMIs raised premiums numerous times, but in order to prevent what would have otherwise been overwhelming adverse selection they also significantly tightened underwriting guidelines. They completely stopped insuring investor loans, loans with cash out refinancing, loans with deep buy-downs, and loans in regions with a weak economy due to a systemic risk factor, e.g. the oil patch (Hendershott and Waddell, 1992, pg 12). Even these steps didn’t save all the PMIs, but the industry survived the decade and the investors’ losses due to PMI failure, mostly at Fannie and Freddie, were minimal.

Under political pressure to meet social goals, FHA generally did the opposite. It first lowered prices, and then it allowed borrowers to finance the premium in the loan amount. Moreover, by 1988-1989 investor loans and loans with an initial loan to value ratio above 95% accounted for more than half of FHA’s business. The combination of adverse selection and systemic risk arguably left the fund technically insolvent and clearly not actuarially sound, requiring a legislative bailout which came in 1990 with passage of the Cranston –Gonzalez National Affordable Housing Act, protecting Ginnie Mae.¹³

¹³ See Hendershott and Waddell, "Changing Fortunes of FHA's Mutual Mortgage Insurance Fund and the Legislative Response," *Journal of Real Estate Finance and Economics*, 5, 1992, 119-132.

Origins of Social Lending Goals

Citing Fannie Mae's requirement to get prior approval from the HUD Secretary for buying conventional loans and HUD's authority to require loans for low income households and central cities, HUD Secretary Patricia Harris proposed rules requiring 30% for each. The comments were 1217 against and only 16 for, so much weaker non-binding goals were imposed. These were more for political effect as they had little impact on actual lending patterns at that time, they were weakly enforced and the cost, if any, was easily absorbed by the huge interest margin owing to agency status. Nevertheless, the principal of HUD imposition of social goals through regulation was established.¹⁴

Some of the political populism directed toward the GSEs during this era was also directed at the banks (and thrifts) and independent mortgage bankers. Political complicity in the promotion of loans in low income neighborhoods started in the 1970s in the form of the Community Reinvestment Act (CRA) and the Home Mortgage disclosure Act (HMDA).¹⁵ Superficially it makes sense to expect lenders to lend in the local community and to collect data. The CRA was initially motivated by the concern that FHA had been lending to unqualified borrowers and the resulting defaults were destabilizing neighborhoods. It was believed that banks would act more responsibly, lending only to qualified borrowers.¹⁶

But the reality of the home mortgage market was quite different. By the end of the 1970s there were literally thousands of potential loan brokers who would profit from originating loans in such neighborhoods if they could be underwritten to the standards of the most liberal investors nationwide. The competition to originate loans, described as "cut-throat" by the head of the Mortgage Bankers Association in 1945 (Hendershott and Villani, 1994), became even more competitive as the originate-to-sell-model began to dominate. Moreover, such loans were easily sold to FHA if other buyers proved reluctant. Local branch offices of banks were rarely responsible for mortgage lending in any event, so the CRA decision wasn't made locally. But community based political action groups recognized that regulators now had discretion over a bank's "franchise value" (issuing insured deposits), in this case the right to branch and merge with or acquire other banks, and this gave them political leverage to extract subsidies.¹⁷

Innovation in Securitization: Partitioning Interest Rate Risk

Private and public securitizers continuously sought ways to get around the inefficiency of the "grantor trust" limitations driven by tax law. Working with Larry Fink at First Boston, Freddie Mac, which was still tax exempt in 1983, found a regulatory exemption for itself that allowed pre-payment "tranching." It issued the first collateralized mortgage obligation (CMO), as a consequence of which all investors no longer had to accept the uncertain cash flows for the entire 30 year life of the mortgage pool as some were paid off earlier than others. The CMO left

¹⁴ This discussion is contained in John Weicher, "Setting GSE Policy through Charters, Laws and Regulations," *Serving Two Masters Yet out of Control*, ed. by Wallison, chapter 6, AEI, 2000, pg 125.

¹⁵ See Wallison (2009) for a discussion of this history.

¹⁶ Tony Yezer of George Washington University provided this useful insight.

¹⁷ See Steve Malanga, "Acorn's a Creature of the CRA", Real Clear Politics, September, 2009.

a residual, or “equity tranche, held by Freddie Mac. This innovation allowed Freddie Mac to finance 30 year fixed rate pre-payable mortgages substantially cheaper than with the pure pass-through PC modeled after the Ginnie Mae security that it soon replaced. The steeper the yield curve, the more the savings as shorter tranches were priced off the front of the curve. This potential was subsequently extended to Ginnie Mae securities as well as private label MBS by the REMIC Act of 1986.

Origins of “Agency Status”

Wall Street learned to love mortgage backed securities (MBS) in the 1970s precisely because they were complex and the cash flows of pre-payable--and at the time assumable--fixed rate home mortgages became extremely difficult to predict. Unlike government bonds or highly rated corporate bonds, there was now a reason to trade MBS based on different prepayment (and assumption) views. As interest rates became more volatile during the 1970s, there were both premium and discount pools to trade. Soon thirty year home mortgages traded on average as much as once a month in securitized form, reflecting the different opinions of investors and traders regarding future interest rates and prepayment.

As security issuance and trading volume skyrocketed in the mid-1970s, *it was the lawyers and advisors to the Wall Street trading firms that made a judgment that such securities would be backed by the government in the event of default*, in spite of the specific disclosures to the contrary, because they still maintained the regulatory and tax exemptions of a public entity. It traded them as “government agency” or GSE securities on the “government” or “govie” trading desk from then on.¹⁸ As volumes soared, the market itself became “too big to fail” and there was no denying the implicit government backing, removing all pretense of market discipline.

Private Securitization and Credit Rating Agencies

Privately placed mortgage bonds date back to the late 1800’s in the US. More recently, the investment bankers had been trying to address the same problem as Ginnie Mae and Freddie Mac of mortgage access to the capital markets in the 1970s, as the GSEs were essentially providing regulatory forgiveness for what was essentially an investment banking function. Robert “Bobby” Dall at Salomon Brothers was the first to try by publicly issuing rated mortgage backed bonds in the 1970s, the first for Bank of America. But in addition to the numerous legal and regulatory obstacles, the treatment of credit rating agencies also discouraged issuance. Collateral had to be continually posted at *market* value to support the *par* value of the bonds (so called market value mortgage backed bonds (MMBs), leading to as much as 100% over-collateralization when interest rates rose and prices fell, which happened with increasing

¹⁸ This included Ginnie Mae, Fannie Mae and Freddie Mac (the “cousins”) as well as the FHLB System. Later GSE references are limited to the two “privatized” entities Fannie and Freddie.

frequency in the 1970s and early 1980s.¹⁹ These were later replaced with “cash-flow” collateralized MMBs.

Two things changed in the 1970s that would give a big boost to the rating business. First, beginning in 1975 with the SEC adoption of Nationally Recognized Statistical Rating Organizations (NRSROs) the risk regulators began moving away from what was “prudent” to reliance on risk-based ratings as measured by the ratings given basically by the three credit rating organizations so recognized at the time. Second, starting in the late 1970s Michael Milken at Drexel Burham Lambert started issuing bonds that were rated junk at the time when they were issued, whereas prior below investment grade ratings all reflected downgrades. This created a two-tiered new-issue market of investment grade and junk while converting published rating agency “opinions” into a regulatory sanctioned approval.

The 1986 REMIC Act essentially ended grantor trust prohibitions on managing cash flows so long as they all got passed through. The intent was to foster private securitization by facilitating management of the underlying credit risk, particularly to allow credit “tranching”, i.e. into senior and correspondingly subordinate securities following the CMO approach of interest rate tranching.²⁰ Numerous variations ensued. Most of the MBS and derivative securities used decades later were incubated during this period of experimentation.

The newly privatized Freddie Mac and particularly the long since privatized Fannie Mae bitterly opposed private competition and used not only their considerable investment banking business but also their substantial political mite to prevent private securitization from becoming established. Hence all of the innovations in private securitization came in markets that Fannie and Freddie were legally prohibited from entering-- such as jumbo mortgage loans, or didn't want-- such as sub-prime mortgages. Ginnie Mae stayed out of the political fray because it already enjoyed an unchallenged substantial pricing advantage and had no private shareholders.

Prelude to the Sub-Prime Lending Debacle 1990 to 2000

The prelude decade exposed three regulatory distortions that would contribute to the latter systemic crisis. The first stemmed from treating GSE securities as risk-less. The second stemmed from FDIC and SEC risk-based capital regulations regarding credit rating agencies and accounting for senior/sub securitizations. The third stemmed from regulatory enforcement of social lending goals to unqualified borrowers.

Proprietary Trading and Hedge Funds: Bad Precedents

Prepayment dominated MBS trading strategies from the 1970s at least through the end of the 1990s. In 1994 Orange County, one of the richest governments in history, was forced to declare bankruptcy in the wake of massive losses in its cash accounts. Its investment manager,

¹⁹ The rating agency problem was addressed in the mid-1980s with the introduction of the “cash flow” mortgage backed bond.

²⁰ Residential Mortgage Investment Trusts (REMICs) provided for credit risk tranching, leading to Collateralized bond offerings (CBOs) and the like.

Robert Citron, had collected all the liquid cash accounts that numerous local governments held in their local bank accounts to meet the public payroll and deposited them at Merrill Lynch. He then leveraged them with repos, and invested them directly in supposedly “liquid” risk-free GSE securities. But of course they were neither: they were marketable with volatile interest related options that were employed in speculative “risk-controlled arbitrage” strategies largely designed by Merrill Lynch. Citron was considered a hero for years as the higher earnings from this speculation allowed local politicians to keep taxes down. But he was essentially “playing the yield curve” by investing in long term securities as well as earning excess “quoted yield” that reflected not higher expected returns but rather the “option premium” for prepayment risk using excessive leverage. When GSE MBS prices subsequently plummeted as interest rates rose, past gains were wiped out, bankrupting Orange County and severely wounding San Diego County finances.

Citron and other cash managers obviously had no business turning taxpayer cash accounts into a proprietary trading hedge fund managed to ignore the tail risk. Whose responsibility was it to stop them? The answer in this case was that politicians who provided oversight took responsibility when the bets paid off and blamed Wall Street greed when they didn’t, a political lesson that didn’t go unnoticed.

The First Private Sub-Prime Securitization Debacle

The first big sub-prime mortgage lending boom and bust occurred in the mid 1990s. Private mortgage originators found that they could book much higher profits by privately securitizing uninsured sub-prime loans in senior/subordinate security structures than by selling qualified loans to the GSEs or to banks or thrifts. These loans were provided to people with generally bad credit but who either had substantial cash down-payments or more often housing equity based on appraised value of at least 20% to 30%, precluding the need for mortgage insurance. They typically were not eligible for sale to the GSEs due to the borrower’s low credit scores. Originators chose private securitization over internal bank funding because the rating agencies dramatically over-valued the cash equity and hence under-estimated the default risk and over-rated the securities. This allowed excessive amounts to be financed in the investment grade tranches with only a small retained equity strip and no financing cost for the additional risk. In addition, following “present value” GAAP accounting rules dictated by the SEC, these firms booked large current profits based on projected lifetime revenue of the residual interests--net of modest projected default costs--discounted at a relatively risk-free rate, with all parameters again specified by the SEC.

So banks spun out their mortgage banking divisions free standing mortgage banks that went public as finance companies based on these high reported profits. The balance sheets combined retained interests from securitizations with servicing contracts from origination. The high reported profits allowed them to raise both equity and high yield (junk) bond debt relatively cheaply to fund residual interests of only 2%-4% of the pool, thereby achieving about 100-1

leverage or more. Some of these lenders converted to REIT status to avoid paying taxes on the investment earnings of these retained strips (and potentially on the operating profits as well).²¹

The credit rating agencies—enabled by the SEC—facilitated the funding of the remaining 96%-98% of the funding. In recognition of the franchise value bestowed by regulators, the rating agencies began charging issuers for the rating. Bank regulators became increasingly reliant on risk based capital rules embedding it in Basel I. Even the government enterprises had gotten into the act, buying investment grade sub-prime securities, encouraged by favorable regulatory risk-based capital requirements.

By the end of this era virtually all investment grade investors eventually depended on how the ratings agencies rated securities rather than on primary mortgage insurers or their own independent analysis for several reasons. First, they had historically proven reliable. Second, they were recognized in regulatory risk-based capital rules. Third, the yields no longer justified the cost of insurance or independent analysis as the market traded them based solely on the ratings at prices that were homogeneous to similarly rated corporates.

The failure of LTCM and the Russian default temporarily froze securitization markets. But the real underlying problem was that the profits based on projections extending out 30 years turned out to be mostly fictitious as borrower defaults soared and the high assumed equity of the underlying mortgages proved insufficient to cover all losses.²² It took investors several years to catch on, but by the end of the decade virtually all the independent publicly traded sub-prime lenders filed for bankruptcy. The managers all made huge sums starting companies and taking them public, and many investors, particularly those who never believed in the business model made a lot of money as stock prices ran up in reaction to the high reported profits. Only those investors that got in late and holders of high yield bonds lost out. These lending operations then largely migrated back to large insured deposit institutions (banks and thrifts, no longer distinguishable and hereafter banks) or their subsidiaries and later to the TBTF investment banks as well.

Social Lending Goals Start to Bind

In 1995 President Clinton directed HUD to boost the homeownership rate to an “all time high by the end of the century” which HUD Secretary Cisneros articulated to be 70% in the National Homeownership strategy. The homeownership rate had remained stable at 65% for over three decades even with mortgage credit generally available with no down-payment and often underwritten at teaser interest rates and no evidence of qualified borrowers being denied credit. Hence reaching this goal would require major outreach and presumably large subsidies.

²¹ An REIT was like a grantor trust in that it was tax free as long as it was purely an investment vehicle and the earnings were paid out in dividends. Rule changes in the 1990s allowed a REIT to have a taxable operating subsidiary such as a finance company. The residuals were then transferred to the REIT. Of course the price at which they were transferred determined the subsidiary’s tax liability, which was subject to abuse.

²² Whereas investors typically discounted these extremely risky cash flows at about 30%-40%, SEC rules generally discounted them at about 8%, resulting in a book value many multiples of the economic or market value.

The Clinton Administration in 2000 specified who the new homeowners were to be and how they were to be financed, requiring that 50 percent of Fannie and Freddie new mortgage acquisitions be for “affordable housing” as defined by three goals established by Congress in 1992: 1. **Low- and-Moderate-Income Goal**, which targets borrowers with income no greater than area median income; 2 **Special Affordable Goal**, which targets very low income borrowers and low-income borrowers living in low-income census tracts, and; 3. **Geographically-Targeted or Underserved Areas Goal**, which targets low-income and high-minority neighborhoods. The Bush administration continued this policy and for 2003 upped the affordable housing quota to 27 percent for category (1), 56 percent for category (2), and 39 percent for category (3), with substantial overlap.²³ No subsidies were budgeted to achieve these goals.

By the mid-1990s the political pressure for credit allocation to minorities had also been ratcheted up significantly, partially in response to the study published in 1992 by the Boston FRB arguing that discrimination persisted, a study subsequently shown to be fatally flawed.²⁴ (The offending mortgage banker was a black man who actively recruited black borrowers with weak credit, leading to his higher rejection rate.) As one example, Deval Patrick, as Assistant AG in the Clinton Administration (and later Governor of Massachusetts), took the position that racial differences in the percentage of approved loans as well as differences in pricing were assumed to be evidence of discrimination regardless of the borrower’s credit worthiness.

An article by Joanne Pierson “Navigating the Shoals between Alan and Deval” captures the essential conflict between prudential regulation and credit allocation. As Federal Reserve Board Chairman, Alan Greenspan argued that banks should discriminate on the basis of risk and price accordingly. As Deputy Attorney General of the Justice Department, Deval Patrick argued that whenever the final result produced racial disparities (the only kind of disparity he was interested in) that represented a violation of Federal law unless the lender could prove otherwise. Such proof is problematic as the result itself is considered proof of racial prejudice not subject to analysis, and the cost of a legal defense is generally crippling. The alternative to litigation is to err on the side of leniency and sign DOJ quota agreements when required to do so. This was called “confiscation by consent decree” at the time and later in a related context “extortion by consent decree.”²⁵

In this context, it is difficult for regulators to restrain lenders from “voluntarily” entering in to a quota agreement with the DOJ or liberalizing their underwriting guidelines to implement these quotas. These quotas covered a lender’s entire origination network regardless of how funded and hence were likely more binding than those previously applied just to commercial banks in certain neighborhoods.

²³ Harold L. Bunce, “The GSE Funding of Affordable Loans: A 2004-2005 Update,” *Housing Finance Working Paper Series*, Office of Policy Development and Research, United States Department of Housing and Urban Development, Working Paper No. HF-018, June 2007.

²⁴ See Munnell, Browne and McEneaney (1992) and US House of Representatives Staff report (2009, pg6)

²⁵ After the first lender that was targeted failed while fighting the law suit, others readily agreed to quotas. See Paul Craig Roberts, “Confiscation by Consent Decree”, *National Review*, vol. 46, October 24, 1994 and also Jo Ann s Barefoot, “Navigating the Shoals between Alan and Deval: How do Banks Price for Credit Risk While Avoiding Discriminatory Pricing”, *ABA Banking Journal*, Vol. 88, 1996.

Meanwhile populist pressure for credit allocation at commercial banks was growing. The CRA amendment passed in 1989 to publicize an institution's rating and performance evaluation seemed to invite political extortion just as branching laws were being repealed and banks had little or no control over loans originated in the area of their branches. The Clinton Administration also ratcheted up CRA lending pressure with the threat of fines and other enforcement actions.²⁶

The Systemic Sub-prime Lending Debacle 2000 to 2010

The first lesson of the first sub-prime failure is that bypassing the primary mortgage insurers leads to unregulated moral hazard. The second lesson is that even substantial borrower equity of 20%-25% based on appraised value in a rising housing market and lender equity of 2%-4% is insufficient capital to fund weak borrowers. The third lesson is that profits can be booked well before losses, producing winners and losers in a loss making enterprise.

The sub-prime lending debacle of 2004-2007 was the earlier debacle on steroids. There were not enough borrowers who had sufficient cash for a down payment who also met the criteria of the social lending goals. Once Fannie Mae and Freddie Mac found it necessary to bypass the private mortgage insurers to achieve these social goals, widespread lending to weak credits with little or no equity fueled a bubble in housing prices which later resulted in the massive default and deep loss exposure. Private securitizers were able to pass most of their risk of social lending on to Fannie and Freddie or investors in private label MBS, largely funded both on and off balance sheet by banks.

Bypassing Primary Mortgage Insurers

Most sub-prime borrowers had little or no cash down-payment, and most of the borrowers couldn't afford to pay the normal principal, interest, insurance and taxes, let alone a mortgage insurance premium. Instead, they rolled over loans with a teaser rate typically at least 2% less than the fully indexed rate. As they represented most of the potential for mortgage insurance in the last decade, there were too few good borrowers who could subsidize the insurance pool. There was likely no actuarially sound price at which the risks of the sub-prime loans being originated in the early to mid part of the last decade could be insured even in otherwise good economic times and with moderately increasing house prices. And the house price bubble of mid-2004-2006 following a five year boom clearly represented an uninsurable systemic risk.

PMIs: Private mortgage insurers are regulated by state commissions whose duty to actuarial soundness is not distorted by any social mission. And private mortgage insurance companies generally recognized a house price bubble and systemic risk early on. So having been previously burned in the 1930s and 1980s the mortgage insurers were extremely reluctant to continue to

²⁶ Neil Bhutta, "Giving Credit Where Credit Is Due" The Community Reinvestment Act and Mortgage Lending in Lower Income Neighborhoods," Federal Reserve Board working paper 2008-61, Washington, DC 2008.

insure. Hence the PMIs, bruised by the worst mortgage defaults since the Great Depression, are still “the last men standing.”²⁷

FHA: HUD must by Charter regulate FHA in an actuarially sound manner. FHA’s market share, about 90% of which were fixed rate loans, stayed in the 10% to 15% range of total originations from 1985 through 2001. FHA loan originations set records during the housing boom through mid 2004, but tailed off rapidly during the bubble, cut in half from the boom years 2003-2004 to the bubble years 2005-2006. As a consequence Ginnie Mae’s share of total securitizations fell from 42% in 1985 to only 4% by 2006. FHA is still standing, but not tall. FHA insurance nominally requires a 3% down-payment, but as sellers were allowed to provide 6% in cash concessions, the effective loan-to-value could be as high as 103%.²⁸ According to CBO estimates, the implicit subsidy necessary to make FHA actuarially sound was \$2 billion by 2007.²⁹ This subsidy will likely skyrocket as the Housing and Economic Recovery Act (HERA) of 2008 raised the maximum loan limit of 115% of median house price up to \$625,000.

“Piggy-back Seconds”: One drawback to private mortgage insurance was that the premium wasn’t deductible, whereas the interest on a second mortgage used for a down-payment was, making second mortgages potentially cheaper than PMI insurance. Second mortgages became even more popular in the 1980s when interest on consumer loans was no longer deductible. The subsequent growth of the market for second mortgages and home equity loans during the 1980s and 1990s would play a big role in supplanting the PMIs during the sub-prime bubble as low down-payment first mortgages were largely replaced by qualified (80% l-t-v) firsts with piggy-backed purchase money seconds financing some and often all of the down-payment.³⁰ This activity doubled from 2002 to 2004 and accelerated thereafter. Mayer, Pence and Sherlund (2009, pg 32) report that about 28% of sub-prime and 42% of alt A (i.e. alternative to prime A) loans had piggyback seconds in 2006 that were reported to the first lien holder. Including unrecorded “silent” seconds could double these percentages. We consider both sub-prime and Alt A categories to be well below prime and hereafter refer to the total of both as sub-prime or “junk.”

Bypassing cash down payment constraints and PMIs with so-called “silent seconds” recorded after the first mortgage closed was openly tolerated by sub-prime lenders and their investors. But first liens with seconds have both a higher frequency of loss and a greater severity than similarly insured loans with the same total l-t-v for several reasons. First, PMI covered the investor down to 75%. Second, the PMI’s maintained rigorous underwriting guidelines that also

²⁷ Their current capital difficulties can be explained by the fall in house prices and economic recession, rather than a lack of underwriting for sub-prime. Industry loss rates skyrocketed by year end 2008 to their previous peak of 1987 and total industry capital fell from 17 billion in 2005 to \$12 billion by year end 2008. Losses have continued but the industry is still writing new insurance and rebuilding capital.

²⁸ FHA proposes a change in the limit to 3% starting in the summer of 2010.

²⁹ See Congressional Budget Office, “Assessing the Government’s Costs For Mortgage Insurance provided by the Federal Housing Administration,” July 2006.

³⁰ See Glenn Seltzer, “PMI Insurers Owe many Thanks to Piggy back Mortgages, Mortgage News Daily, Nov. 13, 2007.

attempted to avoid correlated risks. Third, PMIs are regulated and capitalized, whereas the second may fund phantom equity.³¹

Without continually rising house prices allowing teaser interest rates to be continually refinanced, few of these borrowers could afford the full monthly payment on the first mortgage, let alone the second. This raises the issue of why investors funded these highly risky seconds and the first mortgages they were supposed to protect?

Fannie and Freddie Drive the Sub-prime Market

The 2000 goals were becoming harder to reach as more of the pool of qualified applicants already had mortgages. As the PMIs became increasingly reluctant to insure such loans, they used other means to by-pass them.³² Beginning as early as 1997 Fannie Mae offered a 3% down-payment loan, and by 2003 they offered loans with no down-payments at all (Wallison, 2009, pg3). But mostly lenders used piggyback seconds because both Fannie Mae and Freddie Mac had programs for buying first liens with piggy-back seconds, and Fannie Mae had a program to buy both loans as part of a package. This had the added benefit of counting one household *twice* towards their affordable housing goals, as both the first and second counted separately. It is hard to reconcile buying both an 80% first lien and a 20% second lien on the same house as being in the spirit of requiring a 20% borrower cash down payment or PMI to protect Fannie Mae against credit risk, and impossible to justify prudential regulators writing regulations specifically encouraging it to do so by double counting them toward social goals.

The result was more than an additional trillion dollars of Fannie Mae and Freddie Mac sub-prime funding during the mid-2004 to mid-2007 mortgage lending bubble, and they kept on going.³³ Data published by Wallison (2010) and Pinto(2010), both of AEI, show that by 2008, 54% of Fannie's portfolio and 51% of Freddie's qualified as "low to moderate income," 26% of Fannie's and 23% of Freddie's portfolio qualified as "special affordable" and 39% of Fannie's and 38% of Freddie's portfolio counted toward the "underserved market" goal. As of mid-2008 Fannie and Freddie held a combined 12 million sub-prime loans with a balance of \$1.8 trillion, and total government sub-prime loans totaled 19.2 million borrowers with \$2.7 trillion in principal outstanding. Sub-prime lending grew from a niche market earlier in the decade to almost 40% of the stock by 2008, accounting for most new loans written during the bubble years from mid-2004 to mid-2007.³⁴

How big was the subsidy required to support such borrowers and make the loan payments affordable? One way to measure the subsidy required to fund sub-prime mortgages is to assume that these twelve million borrowers could not or would not pay more than the mortgage payment during the term of the teaser financing which is probably what they would have paid

³¹ See Calhoun (2007) for a discussion of silent seconds.

³² The charter required pmi, an 80% or less senior participation, an equity second, or recourse.

³³ We include what others define as sub-prime and Alt-A (that means alternative to A, or low grade) in our definition of sub-prime.

³⁴ See Peter Wallison, "Barney Frank: Predatory Lender, WSJ, October 16, 2009 as well as Wallison (2010, pp.6-7).

for rent. Assuming for illustrative purposes no tax benefits (few if any itemized) and an annual difference of \$694 monthly, about the teaser rate savings of 2% on a \$417,000 house, the subsidy required to keep these loans current is \$100 billion annually over the life of the loans. Systemic unemployment and eviction and foreclosure costs while owner-occupiers live rent free would increase this amount.

How could Fannie and Freddie avoid failure until 2008, making the inevitable crash systemic? The borrowers were able to refinance the teaser rates until house prices started falling in mid-2005. The loans were booked at or near par when purchased although worth much less than that as accounting for losses lags recognition of risks. And the investors in GSE debt were unconcerned with the amount of leverage.

Why didn't management, shareholders and regulators stop it? Fannie Mae and Freddie Mac shareholders presumably understood the political risk of managing the costs of social benefits against the benefits of agency status, as they encouraged management to spend lavishly on politicians to mitigate it. But management at both Fannie and Freddie got greedy and attempted to capture a bigger share of the "excess profits" for itself during the housing boom by manipulating earnings to increase bonuses, resulting in the two biggest GAAP corporate accounting scandals ever in 2004. Management may have convinced them selves that the loans originated during the boom years would be profitable, although their attempts to manipulate earnings to enhance the bonus pool would indicate otherwise, and stockholders may not have been sufficiently aware of their dramatic change in risk profile during this period.

In the wake of these accounting scandals politicians took the unprecedented step of having new politically beholden CEOs installed at both Freddie Mac and Fannie Mae.³⁵ In addition, the OFHEO imposed an additional 30% capital requirement over the minimum in 2004, reflecting their concern with the massive accounting scandals at both enterprises rather than with the housing boom. Blundell-Wignall and Atkinson (2008, pp 82-84) conclude that this explains why the GSE market share of securitizations fell from 50% in 2004 to below 40% in mid 2006, creating the false impression that Fannie and Freddie were reluctant followers of private label MBS.

But both new CEOs have since testified that they suppressed safety and soundness concerns in favor of meeting their affordable housing goals during their tenure, and internal documents show a policy of regaining the market share lost to private securitizers, which rose to the prior level as soon as the audited accounts were finally released in 2006 and the excess capital requirement was lifted. This required virtually abandoning underwriting guidelines. Risk managers who opposed the policy were summarily fired, and regulators were eerily quiet.³⁶ The

³⁵ Fannie Mae was alleged to have over-stated earnings by \$10 billion to increase current year bonuses. Freddie Mac was alleged to have reduced current year income by \$5 billion, presumably to save to protect future bonuses. Thompson, (2009, pp.8-9)

³⁶ The internal memo from Freddie Mac's SVP for risk management Dave Andrukonis Sept 7 2004 pointed this out. Fannie Mae's Chief Credit Officer Edward Pinto has written several books and articles on their suppressed risk.

aggressive pursuit of market share by Fannie and Freddie during the second half of the sub-prime lending bubble was sure to wipe out shareholders, who could do little about it by this point!

Why weren't economists more vocal in their opposition to the GSE model? The answer is remarkably similar to that of the credit rating agencies. That is, their models were flawed and estimates way off, and their incentives were questionable.

There have been many studies, mostly by the Congressional Budget Office (CBO) that typically calculated the annual interest savings on their debt as a "subsidy" to shareholders and management. The franchise value of agency status was then the present value of that savings, an "opportunity cost" to the government. CBO estimates of the subsidy at the beginning of the decade were about \$10 billion annually. Following this approach Jaffee and Quigley (2008, pg 6) estimated that by 2003 the annual subsidy to Fannie Mae and Freddie Mac due to their agency status was about \$25 billion. The implication is that the annual savings due to agency status—the difference in borrowing costs between what they do pay at agency rates and what they would pay as private corporate issuers—should be paid to the government as a return on equity to an implicit shareholder or equivalently as a "user fee" which hypothetically could be used to fund targeted homeowner subsidies.

Joseph Stiglitz, in a paper with future OMB Director Peter Orszag and his brother Joseph as coauthors (Stiglitz, Orszag and Orszag, 2002, pg. 2) commissioned and published by Fannie Mae argued that the exposure to a severe macro-economic shock *of ten year duration* would cost the government only \$2 million for every trillion in GSE assets with their current risk-based regulatory capital requirements. Put differently, they were sufficiently capitalized, implying virtually no user fee was necessary to cover the risk.

These subsidy calculations are based on the rating agency determination that at their current capitalization but without the benefit of agency status Fannie and Freddie would be AA or AAA corporate issuers. But this assumption seriously over-estimates current capital and under-estimates the risk to that capital.

OFHEO required Fannie and Freddie to hold .45% capital against MBS issues and 2.5% against debt (but only 1.6% for AAA or AA rated private label sub-prime MBS). The GSE book leverage ratios were 100-1 or higher (reaching an average of 200 by 2008 after the asset mark-downs) reflecting the mix of MBS and debt. But Fannie and Freddie were allowed to raise half their "capital" in the form of preferred stock. The risk-based capital requirements at banks treated this stock the same as agency MBS, i.e. with a 20% risk weighting and a 1.6% net capital requirement. Hence the government's leverage was about double the stated book leverage of Fannie and Freddie.

The 2.5% capital requirement for agency debt is only about 30% of the capital required for deposits at banks. But the assets were likely much riskier. The debt was not only funding sub-prime mortgages and MBS but purchase money seconds as well.

When this extra leverage and risk is factored in, by the first half of the past decade Fannie and Freddie were extremely highly leveraged sub-prime finance companies that should have been junk-rated issuers due to their growing uninsured exposure to mortgage default. It is unlikely that they would have been able to issue even junk debt from mid-2004 through mid-2007 had bond buyers examined the books closely due to the systemic risk of the sub-prime lending bubble, so it was agency status that allowed them to keep lending until the bubble became a systemic threat.

Another theoretically equivalent approach to measure the subsidy is that Fannie and Freddie historically wrote way “out of the money” options as residual pool insurers, mostly for the unlikely risk of a systemic failure. Lucas and MacDonald (2005) use the option based approach to conclude that the value to shareholders of agency status was less than \$8 billion cumulatively over ten years, a small fraction of their annual reported profits.

A strategy of writing way out of the money options has no expected excess return, but the actual outcome is likely at one of two extremes: either the options remain out of the money and you never pay, in which case all of the premia becomes profit, or the options come into the money and you pay big, in which case there are large deferred net losses. This concept illustrates the accounting illusion of recording revenue as profit before the option expires, which in this case it never does.

The “subsidy” calculated using the implicit capital approach is functionally equivalent to the option premia. That is, there is no “excess” return to equity, just “tail risk.” So the implicit assumption underlying the concept of a subsidy or surplus is that either markets are miss-pricing risk, the GSEs are generating “positive externalities” or a combination of both. However they looked at it, most economists concluded that the benefits provided by agency status were large and the risks to taxpayers were small. The subsidy was generally implicitly treated as a free lunch for the government to host. Many unqualified borrowers were invited to join with shareholders, management and politicians in the free lunch. The illusion of a free lunch caused politicians to overshoot the mark with binding social lending quotas.

Private Securitizers Compete with GSEs

The GSE regulatory capital requirement gave them a prohibitive advantage in the conforming loan market over portfolio lenders. But the love/hate relationship between the large commercial and investment banks and Fannie and Freddie heated up as the competition for loans became ever more intense. Freddie Mac had an officer whose sole responsibility it was to monitor investment bank loyalty and pricing, pitting one bank against another.³⁷ In order to compete, private label securitizers would either have to find ways to further exploit the regulatory arbitrage opportunities available through deposit insurance to increase leverage or push through more risk and commensurate promised yield for a given leverage ratio to accelerate earnings ahead of default losses. They did both.

³⁷ See Charles Gasparino (2009, pg 413) for a more detailed discussion.

The investment banks (and some as subsidiaries of commercial or universal banks) generally ran the private label securitization machine, producing and distributing the securities. As the up-front profits from private security underwritings were extraordinary, it made sense for them to control or buy the loan originators to feed this securitization machine, which most of them eventually did. The investment banks that underwrote these securities could also fund the hard to sell below investment grade tranches on their proprietary trading desks or sell them to managers of their sponsored hedge funds in order to produce more up front securitization profits.

The Role of the Ratings Agencies and Private Pool Insurers in Private Securitizations

The credit rating agencies have taken the brunt of the blame for not stopping the bubble in private securitization, and most of the specific criticisms ring true (White, 2010).³⁸ The fateful step was going from rating pools of mortgages insured by PMI to rating uninsured pools, replacing PMI judgment and capital with rating agency judgment and reputation. They made three broad mistakes when evaluating credit risk.

First, they didn't sufficiently investigate the underwriting of the individual mortgage loans to learn the extent to which they were sub-prime, as evidenced by subsequent delinquency and default rates nine to 16 times the equivalent rates on prime loans.³⁹ They were slow to adjust to the reality that late in the bubble virtually all home mortgages in the rated pools were going to sub-prime borrowers. They didn't understand how correlated the default risk had become, or the significance of the lack of private mortgage insurance. They certainly didn't see or account for teaser rates and the consequences of the housing price deflation. Surprisingly, as of 1980, when rating mortgage backed bonds both Moodys and Standard and Poors considered only the deflation and default experience of the Depression era, ignoring the more recent inflation of the 1970s. But the old guard was long since gone and their institutional memory had shortened to only five years of rapidly rising prices during the housing boom.

Second, they treated the first mortgages on homes backed by purchase money seconds the same as if they had cash down-payments or PMI. They also rated pools of purchase money second mortgages as if they were the same as home equity loans in the 1980s. Hence these "piggyback seconds" were subsequently securitized with almost as much leverage as first mortgages based on rating agency approved credit tranching. *The excessively favorable rating of piggyback seconds was arguably their most consequential error.*

Third, they were easily manipulated by investment bankers, presumably blinded—some say corrupted—by high ratings fees paid by issuers. This negotiation to load more risk than intended had been going on for decades as risk based capital requirements allowed investors to skip due diligence entirely for most highly rated e.g. AAA securities.

Or maybe they just chose to ignore the risk. The traditional "reputation" concern thought to keep rating agencies honest and accurate was overwhelmed by the profits to be gained from

³⁸ There are many excellent discussions. See for example White (2008).

³⁹ Peter Wallison, op cit.

exploiting the franchise value. The raters and all their employees reaped in a few short bubble years what historically was a lifetime of normal earnings. Bad models offered good cover.

Private Pool Insurers: Pool insurance on municipal securities had been extremely profitable because defaults were so rare. The pool insurers were arguably performing an assurance function, inducing municipalities to mitigate risks. There may also have been a tail risk incentive to providing municipal insurance, as capital may have proven insufficient to cover losses e.g. as likely would have occurred without the 2008 stimulus bail-out of state and local governments. The pool insurers apparently viewed rated mortgage securities as they did municipal securities. The book of highly profitable pool insurance on risky sub-prime loans exploded without a commensurate increase in capital. With little historical experience, they relied more on the credit rating agencies and past experience with insured prime mortgage pools than on independent analysis. Their insurance seemed cheap to private sub-prime securitizers, and was under-capitalized as a consequence. Numerous industry publications questioned the pool insurers' ratings and their ability to pay as early as 2002, but investors accepted it until they lost their insurance AAA ratings beginning in June 2008, well after the risks to their capital had been exposed. By year end they had all been downgraded. Having jumped on a deflating bubble at the top, their regulators didn't catch on until it was too late.

Regulatory Arbitrage in Private Securitization

The goal of private securitizers was to maximize current returns. This required extraordinary leverage, which was achieved in two stages. First, they would "borrow" as much as possible as cheaply as possible through the securitization process in the markets for investment grade securities and where the prices were determined by the ratings. Second, they would maximize the firm's leverage to finance the below investment grade residual interests left behind in the securitization process, or better yet finance these off balance sheet. As in the prior sub-prime lending debacle, SEC and risk-based capital rules directly determined both the yield and leverage of investment grade securities and--along with SEC sanctioned present value accounting that facilitated the acceleration of phantom revenues and the deferral of reserves for subsequent actual credit losses, generating up-front reported profits--of equity funding as well.

Regulatory arbitrage determined the structure of private securitizations which were extremely heterogeneous. On balance sheet deposit funding requires 4% capital for whole loans based on their 50% risk weighting and 8% base capital requirement. AAA and AA securities require 1.6% capital based on their 20% risk weighting, whereas BBB securities required 8% based on a 100% risk weighting. But a commercial bank "sponsored" an off-balance sheet Structured Investment Vehicle (SIV) could purchase virtually any investment grade securities by holding a 'cash reserve", typically around one percent.

The risk weightings favored securitization structures with more AAA and AA securities, but such structures also typically required more below investment grade securities, so whether or not such structures added value depended on the yield and leverage of the below investment grade or junk securities. Multiple layers of securitization reflected the numerous sources of regulatory arbitrage available to securitizers. A collateralized debt obligation (CDO) of an MBS is a

securitization that generally put more of the middle rated tranches into higher rated tranches. A CDO squared (2) is a collateralized debt obligation in which the underlying collateral is a CDO.

Commercial bank regulators eventually caught on to the extraordinary leverage achieved by off-balance sheet “asset sale” securitizations of portfolio assets with retained (equity) interests leveraged with 92% deposit financing and required 100% capital against any retained interests. But the rules for funding investment bank retained interests remained much more liberal. The five biggest non-bank investment banks (Goldman Sachs, Morgan Stanley, Lehman Brothers, Merrill Lynch and Bear Stearns) were all mortgage driven with huge balance sheets, several exceeding a trillion dollars, which could hardly be considered “dealer inventory.” In spite of this, the SEC voted in April of 2004, just prior to the housing market moving from boom to bubble, to designate these five as “consolidated supervised entities” (CSEs) and *lower* their capital requirements.⁴⁰ The theory was based on computer models in the 1988 Basel I Capital Accords. Estimates at the time suggested this would allow an increase in leverage of from 50%-100%.⁴¹ The SEC implemented this rule with no apparent supervision.

As a consequence investment banks had dramatically greater but more opaque leverage during this bubble than in prior decades as stated book leverage ratios approximately doubled. By year end 2007 the book capital to assets ratio for Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley averaged 3.33%, far exceeding commercial bank leverage.⁴² Additionally, book leverage ratios understated the extent of investment bank over-leveraging because they used various accounting gimmicks (e.g. Lehman’s 105 accounting rule that hid \$50 billion in assets) to move assets off their balance sheet. So the retained interests that required 100% capital at banks only required about 3% capital at the investment banks.

Ironically, commercial banks provided most of the funding for this excess leverage for sub-prime MBS. Banks provided some of this leverage directly by lending against the sub-prime collateral, i.e. repurchase agreements, with the amount determined by the credit ratings. They also provided repo funding for both investment grade and junk held by both proprietary trading desks and hedge funds. Much of the rest was funded by short term commercial paper purchased by bank-sponsored SIVs or more likely money market funds that, like SIVs, held only a small cash reserve.

Financing extremely risky retained interests with such extreme leverage was dangerous, but the managers of the securitizers had a big incentive to shift the risk on to their own shareholders. Historically investment banks were all partnerships and managers and owners of investment banks had been one and the same to manage the incentive conflict between shareholder risk and management compensation. Management bonuses were large but mostly deferred until after retirement. By the time of the sub-prime lending debacle, however, all of the firms were corporations, and annual management cash bonuses in some cases exceeded \$100 million.

⁴⁰ See Barth (2009, pg. 166) for a discussion of this action.

⁴¹ The theory implied the balance sheet contained all highly marketable dealer inventories whereas it was a combination of private equity (hotel developments, etc.) and hedge fund (MBS “toxic waste”).

⁴² See Adrian Blundell-Wignall and Paul Atkinson, (2008, pg. 95).

Goldman's managing directors had the greatest long term stake in the firm and not surprisingly they were the first to slow the securitization process down and to partially hedge their proprietary asset holdings.

Some of the most vocal opponents in the other mortgage securitization firms--particularly risk managers who could quickly see through the promised yields to forecast massive losses just as the private insurers and GSE risk managers had done-- were shown the door as was the risk manager at Freddie Mac. But stocks were trading at an all time high, largely driven by the reported sub-prime MBS securitization and trading profits just as in the 1990s. Whether this was all "tail risk" was not an immediate concern of stockholders, many of whom were foreign and some of whom were sovereign wealth funds. Moreover, their current return on equity was multiplied by the substitution of SEC for market risk-based capital.

Profitability of Private Label MBS

Table 1 of the Appendix calculates the weighted average regulatory capital requirements for sub-prime mortgage backed securities (MBS) based on the relative size of senior and subordinated tranches of a typical securitization structure from UBS, "Market Commentary" (December 7, 2007) in Figure 1 of the Appendix. There are numerous possible funding strategies, with more or less leverage, but Table 1 highlights the total capital requirements of the primary funding alternatives.

On balance sheet bank securitization reduces the 4% whole loan capital requirement to only 2.8%. With a 100% capital requirement for below investment grade retained interests, total capital rises with additional CDO securitization, so if banks were going to retain loans, MBS securitization likely pays but CDOs in this structure don't add leverage. But the more highly leveraged CDO and CDO2 structures increase value at the investment banks due to their leverage of retained interests, largely provided by insured bank deposits that finance the commercial paper (cp) and repo lending. Combining off balance sheet SIV financing for the investment grade tranches with highly leveraged investment bank funding for the residual interests reduces total capital required by investment bank securitizers to about 1%. There are infinite variations but the basic storyline is that CDO tranching facilitated almost 94% of the underlying sub-prime mortgage loans to be rated AAA or AA with only 1.6% capital required, as compared to 4% for retained loans.¹ For simplicity the table combined senior and junior AAA, but senior AAA apparently had a significant pricing advantage.⁴³

A hypothetical securitization of a pool of 7% coupon five year mortgages with a net of servicing coupon of 6.5% is illustrated in Table 2 of the Appendix based on the typical senior/sub structure with capital requirements calculated in Table 1 *without* resorting to SIV off-balance sheet financing, i.e. assuming conservative leverage. An investment bank is assumed to sell the investment grade tranches at the assumed yields and accrue interest on the retained BB and NR interests at their assumed yield. (Note, there is enough cash flow projected in the coupon yield

⁴³ For simplicity the table combined senior and junior AAA, but senior AAA apparently had a significant pricing advantage.

to allow for a weighted average yield on the retained interests to be over 86% in this case, we assume much lower (higher risk) again to be more conservative for illustrative purposes.) These mortgages could all be sub-prime with little or no equity underwritten at teaser interest rates and only paying a monthly payment based on a 5% teaser rate.

The up-front reported profit for the sold interests is about 6% gain over the par value of the loans in each case, and the return on equity for the retained interests ranges from 14% for the BB and 34% for the NR residual at a conservative 2 to 1 leverage typical of hedge funds using bank financing to 140% (BB) and 340% (NR) at 20 to 1 leverage available to the proprietary desk of investment banks at their assumed yields. Even if we assumed that the required yields on the investment grade tranches were 100 basis points higher across the board, the front end profits from the sale of these securities would still exceed the total value of the retained interests that would still accrue the same yields.

Similar results could be obtained with securitizations of piggyback second mortgages. An industry trade group estimated in early 2007 that there was \$850 billion outstanding in second mortgage securities, and most of these were issued to fund down-payments.⁴⁴ The \$338 million pool called GSAMP 2006-S5 issued at that time by Goldman Sachs is illustrative. These loans were all sub prime second mortgages issued at the riskiest time in the house price bubble. Without additional leverage, the yield on these second mortgages wasn't sufficient to attract investors. But about half the securities issued against the pool were rated AAA, and only 20% were rated below investment grade. Assuming a 50% haircut on the below investment grade, a shocking 90% of the borrower homeowner equity could be financed with a combination of investment grade securities and bank debt.⁴⁵ Assuming banks financed the investment grade securities with an average 5% haircut, the total regulatory capital would be only 14.5% and investment bank leverage of retained interests at 30 to 1 would reduce total capital to only 5% to replace the cash equity normally required of home borrowers to fund their down payment.⁴⁶ The reported profits from this securitization would be comparable to those reported above for first mortgages.⁴⁷

The proprietary traders also profited handsomely in the short run. The retained interests valued on the books as "marked-to-model" as markets were often thin to non-existent for such securities. Hence they were held at par and accrued the high assumed interest rate (in this case up to 340%). Traders were often compensated as hedge fund managers, i.e. receiving 20% of the yield over a treasury benchmark as an annual cash bonus, often earning tens of millions of dollars annually for years even though borrowers didn't ever pay the coupon rate as most borrowers were paying a monthly payment based on a teaser interest rate. Bonuses were not

⁴⁴ See Calhoun (2005, 2006) for a discussion of the data and risk of piggyback seconds.

⁴⁵ Sure enough, the AAA rating dropped to the lowest investment grade rating of Baa within months after the issue and was rated junk--reflecting its true "when issued" quality--before the year was out. Now it is invisible toxic waste.

⁴⁶ $4.5\% (.05 \times 90\%) + 10\% (.5 \times 20\%) = 14.5\%$ and $4.5\% (.05 \times 90\%) + .66\% (.033 \times 20\%) = 5.16\%$

⁴⁷ If hypothetically the average yield on the below grade securities was 15% and half could be borrowed at 5%, then the return on equity would be 25%, i.e. $15\% = .5 \times 5\% + .5 \times 25\%$.

returned even if the accrued interest was later reversed and the par value of retained interests was written down to zero.

So the up-front profits from securitization swamp concerns with the risk of the residual interests for the securitizers, especially if they fund them off their own balance sheet in sponsored hedge funds. Even if the retained interests subsequently prove worthless, the shareholders would still retain profits of 6% of the gross volume of securitizations in this example, or whatever was left after management bonuses to the securitizers.

That explains why proprietary traders or hedge fund managers would invest in private label MBS retained interests, but why would rational investors in independent hedge funds? Hedge funds are notoriously opaque and had reported profits for years buying worthless MBS. And it turns out their investors were largely public pension funds for whom higher returns also meant lower contributions that translated into higher promised pension benefits guaranteed by taxpayers. In addition, many plans have a provision for beneficiaries to reap any “excess” earnings in the form of bonus retirement pay-outs of an extra month a year, while taxpayers are responsible for the losses.

Hence any mortgages that could go through the machine and produce marketable securities were acceptable to the securitizers, and loans that couldn't were generally put into affiliated banks.⁴⁸ Credit risk wasn't a concern to the securitizers, and higher stated coupon yields increased reported securitization profits regardless of whether or not any of the extra interest was ever expected to be paid. So as long as the credit rating agencies weren't looking at the actual loans, securitizers demanded increasingly risky higher coupon “product” from their originators. As qualified borrowers became scarcer, they actively recruited households that had no thought of buying a home due to their income and credit, and to whom the fees, typically added to the loan principal and coupon mortgage rates mattered less than the low initial monthly teaser rate payment. Monthly payment, not house price, was the limit. In a role reversal, the lender contacted the household who then went house-hunting, a process sure to result in adverse selection.

The investment banks continued to operate the sub-prime securitization machine at full volume so long as banks continued to facilitate the extreme leverage needed to report such high profits. Private-label MBS funded 7.8 million (generally higher balance) sub-prime loans with \$1.9 trillion outstanding by year end 2008. That's about 30% of all sub-prime loans (but 40% of the principle due to the higher average loan balance). The level of subsidy necessary to make sub-prime loans financed with private securitizations viable is commensurate with that of the GSEs as is the capital deficiency. But the cost to taxpayers is more opaque as consumers will pay more for

⁴⁸ Ambrose, LaCour-Little and Sanders (2005) assume banks have an incentive to fund their worst loans because the exposure to residual interests is less than for retained loans. But the reason for a banking affiliation is to permanently fund loans that fail to pass through the securitization filter (however porous it subsequently became) for risk or documentation reasons. Short term securitization profits swamp the contingent liability, and the FDIC doesn't generally review the loan files so the regulatory arbitrage favors deposit financing with a 50% risk weight.

financial services, likely for a generation, to finance the explicit costs of FDIC resolution and implicit costs of TBTF protection.

Lessons Learned and Policy Prescriptions

In early 2010 the then House Speaker Nancy Pelosi called for a new Pecora Commission--the 1932 Senate hearings that blamed Wall Street for the Great Depression and gave Glass-Steagal the political impetus it needed—resulting in the formation of the Financial Crisis inquiry Commission (FCIC). But rather than wait for the FCIC report, the 2,315 page Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 adopted that political narrative in legislation.

Bailey and Elliot (2009) endorse that narrative but prefer narrative 3--Fannie and Freddie as victims and saviors--because it leads to their preferred regulatory prescription. That investment bankers would exploit profitable arbitrage opportunities whether created by markets or regulators is hardly news, but explains nothing. The evidence presented above overwhelmingly fits the first narrative, that regulatory distortions caused the sub-prime lending bubble. But the narratives aren't mutually exclusive, and ultimately a judgment is required on the benefits and risks of alternative approaches. What is the evidence in support of the third narrative?

Narrative 3: Fannie and Freddie as Victims and Benefactors; Implications for Policy

While Chief Economist at Freddie Mac Robert Van Order often argued that the GSE charter was just an appropriate alternative to a commercial bank charter. Sanders and Van Order (2009) propose the reincarnation of GSEs with a “dueling charter” to support fixed rate mortgage lending. The “duel” is over which charter provides greater regulatory arbitrage, thereby exposing taxpayers to the most risk. This proved that we can either have a market-oriented or government-driven system, but having both operating side by side with “dueling charters” competing to maximize regulatory arbitrage was worse than either of the alternatives.

Whether Fannie and Freddie led the sub-prime lending debacle or followed and was victimized by it can't be definitively proven. Putting aside the fact that Fannie and Freddie financed more sub-prime loans than private label MBS and the timing issues, the case that Fannie and Freddie led and the private MBS followed is compelling. Both required extraordinary regulatory laxity. In the case of Fannie and Freddie this was almost entirely political, chronic and inevitable. The bank regulators proved unbelievably inept, but without the competition in regulatory arbitrage from the GSEs private securitizers could have earned comparable profits without taking the self-destructive risks.

What are the arguments in favor of GSEs? There are three related economic arguments for Fannie and Freddie as benefactors of US mortgage finance: 1. they mitigate systemic risk, 2. they correct various “market failures” and 3. they generate “positive externalities.”

1. Systemic Risk

Mortgage credit markets have gone through periods of systemic bubbles and shortages. While economists have considered the potential for Fannie Mae and Freddie Mac to be an instrument

of countercyclical housing policy--whether resulting from a government induced systemic risk or "market failure" is arguable--their institutional and political bias is pro-cyclical, as rising house prices and mortgage rates late in a boom typically result in political action to address the "affordability" crisis. The Woodward (2010) story of FHA and Fannie Mae riding to the rescue of the mortgage market during the Great Depression with the fixed rate self amortizing mortgage apparently dates to the 1970s when FHA faced the threat of political extinction and Fannie Mae needed to protect its private franchise value.

The Fed position has long held the view that the GSEs were a potential source of systemic risk.⁴⁹ In spite of all the other faults that have since been revealed in the financial system, it is unlikely we would have got to the point of systemic collapse without the GSEs. The crisis became systemic internationally because the GSEs have promoted their securities to investors globally for at least three decades, and the Chinese central bank alone held over a half trillion dollars in GSE securities in late 2008. They treated GSE securities as equivalent to US Treasury securities investing trillions of dollars for the slightly higher (quoted, not expected) yield. Government backing was a necessary condition for the sub-prime lending debacle to grow to systemic proportions before crashing.

2. "Market Failures"

Markets are never perfect. The principal/agent conflict between investment bank owners and managers is one example, but even this had its origins in GSE securitization (Villani, 2010). Hedge fund manager compensation is also asymmetric, but the costly distortion reflected the asymmetric incentives of public pension funds, a dominant investor, for passing profits to pensioners and losses to state and local taxpayers. In what ways might markets fail that are amenable to a GSE repair? We conclude that the accusations of market failure during the sub-prime lending debacle generally reflect regulatory-induced incentive distortions.

Discrimination: Insurance only allows for pricing the uncertainties of borrower underwriting for collateralized lending. Credit risks that can't be insured can't be priced. There is no substantive evidence that US credit markets systemically under-served or over-priced credit to any politically sensitive borrower group. If anything, origination markets have been overly competitive, resulting in excessive lending, as evidenced by other consumer loan markets and the historically low net US savings rate. US mortgage markets have generally provided the most liberal terms to qualified borrowers among housing finance systems in market economies.

Security Pricing: Levitin, Pavlov and Wachter (2009) argue that investor pricing models caused them to under-price credit risk of sub-prime MBS and the lack of a market to short these investments allowed the magnitude of miss-pricing to grow until the resulting failure was

⁴⁹ FRB Chairman Bernanke (2009) argued based on the contemporaneous crisis situation that government (GSE) securitization is needed in times of crisis, and did not take the opportunity to call for the elimination of Fannie Mae and Freddie Mac. He defines the GSE problem as the conflict between private shareholders and the public interest to be solved with regulation, rather than the alignment of stockholder with political interests not aligned with the public, understandable for a political appointee but not for a systemic risk regulator.

systemic. In our view, there was no collusion among investors in the choice of pricing models, no shortage of shorting mechanisms and no *ex ante* price to charge sub-prime borrowers that could have prevented the subsequent investor credit losses. Rather, there were few if any traditional at-risk investors in investment grade MBS that were pricing credit risk due to risk-based capital requirements based on credit ratings. Primary mortgage insurers were bypassed because the risks couldn't be priced.

Informational Asymmetries: A large literature has developed around the proposition first put forward in Greenbaum and Thakor, "Bank funding modes: Securitization versus deposits" (1987) that securitization is an alternative to bank deposits and which will dominate depends on "informational asymmetries" relating to the risk of the underlying loans.⁵⁰ Investors in MBS are thought by some to be at an inherent disadvantage because they have less information than the lenders and securitizers. With deposit insurance and agency status ignorance is bliss. Numerous analysts (e.g. Gorton 2008) have concluded that a major cause of the systemic financial crisis of 2008 was that investment bankers purposely made investment grade securities overly complex to trick investors. Some analysts have argued that originators, securitizers, rating agencies and other intermediaries conspired to mislead investors into purchasing securities that were much riskier than the investors were led to believe.

This argument is as old as the securities market. Informational asymmetries are the general state of the universe, but buyers typically pay more for good relevant information, so honest sellers have every incentive to provide it. Since the advent of computer tapes on pool data several decades ago regarding the loan origination and servicing data, all funders can have access to the same data as the originator. It is just a matter of what they ask for. Investors in investment grade MBS could have access to the same data as the securitizer but are no more likely to ask for it than are bank depositors or GSE investors: that job has been delegated to intermediaries since the SEC designation of NRSROs and it wouldn't be efficient to analyze the data independently unless and until market discipline is restored.

3. Positive Externalities

There are externalities to any multi-trillion dollar government intervention. We conclude that the positive externalities are relatively minor at best.

Liquidity: Woodward and Hall (2009) argue for a government duopoly with private shareholders to issue government backed opaque mortgage backed securities, essentially a return to the status quo ante of private ownership for public profit, in order to promote the "liquidity" of fixed rate mortgages. This is an explicit or implicit theme of other promoters of GSE reincarnation as well. They really mean "marketability," a narrow bid-asked spread, as long term MBS trade in a narrow bid-ask range but at prices that can diverge significantly from par. If this argument had merit, it should apply equally to corporate debt, particularly junk bonds. There is

⁵⁰ Stuart Greenbaum was at the time a member of the Board of Directors and Chairman of the Finance Committee of ICA, which owned Imperial Savings, the largest securitizer on the west coast at the time. I was CFO.

no evidence of home-borrowers benefiting from the rapid turnover of the mortgage stock.⁵¹ What they view as a “positive externality” has historically been a vehicle for regulatory arbitrage facilitating the trade of risky pre-payment options opaquely.⁵² Using a government guarantee combined with opaque disclosure to suppress risk in the interest of homogeneity has in the past primarily benefited Wall Street proprietary traders at taxpayer expense.⁵³

Hedging and Forward Delivery: Davidson and Sanders (2009) provide a credible explanation why over the counter forward delivery markets are more likely to develop in government guaranteed than private securities markets. Forward delivery to be announced (TBA) markets are an important hedging and security delivery mechanism, allowing forward sales of securities before the underlying loans are closed. Nevertheless, the bulk of hedging for mortgage pipeline risk (i.e. the risk of price changes during the period from when the borrower’s rate is “locked” and the loan is ultimately financed) is done with US Treasury futures and options where trading volume is greatest. This does not provide for hedging post closing pre-payment risk, generally considered modest over the lock time horizon of one to two months (especially as compared to pipe-line fallout risk, i.e. the risk that once sold forward the loan is not closed), although significant over the life of the loan. Their may well be a modest positive externality, but this pre-payment risk can be hedged separately from a deliverable new origination forward market.

Fixed Rate Loan Availability and Pricing: Woodward (2010) makes essentially two arguments: first, that fixed rate mortgages with no pre-payment penalty won’t exist (or won’t be “sufficiently available”) without the GSEs, and second that the GSEs lower interest rates more than private securitization. Support for fixed rate mortgages with full call protection is the most frequently cited rationale for Fannie and Freddie and alternative hybrids. Proponents have never identified what unique advantages these intermediaries have other than occasional references to “liquidity” which presumably provides the positive externality. We identify only regulatory arbitrage advantages and opaque subsidies that lower the cost and increase the availability of FRMs, both at taxpayer expense.

Fixed rate loans should be widely available through either covered bond or appropriately structured and regulated private MBS financing without GSEs as middle-men. The difference in pricing will reflect the cost of capital, historically woefully insufficient at the GSEs. But it is also the case that the institutional investor markets have changed in two fundamental ways since the growth of mortgage capital markets in the 1970s. First, the excess demand for fixed income securities that motivated the creation of the Ginnie Mae pass-through in 1970 has been reversed. Whereas in 1970 about 70% of long term savings was in fixed nominal life contracts

⁵¹ References to the extent GSEs lower borrower costs are misleading. Transparency and investor awareness mitigates the need to trade, making wider bid-asked spreads a moot issue. Of course, this is devastating for Wall Street traders.

⁵² Woodward and Hall (2009, pg2.) argue for opaque prepayment risk as a positive trade-off to the “liquidity” benefit of homogeneity, citing the minimal call features in otherwise non-callable municipal bonds. But that is orders of magnitude different from \$5 trillion of fixed rate securities whose maturity can range anywhere from 30 days to 30 years.

⁵³ This is the essence of the Orange County Ca bankruptcy in 1992.

and pension annuities, today that percentage has dropped to only about 10% as retirement plans are now indexed or performance based.⁵⁴ The remaining fixed income demand can generally be met with the advent of high yield bonds and other credit market instruments. Hence future borrowers seeking long term fixed rate loans may face a steeper yield curve.

Second, pre-payment risk—minor when these instruments were introduced—is now paramount. The price paid (the higher mortgage coupon rate) to have a contractually free pre-payment option may also rise as a consequence of market fundamentals. As the prepayment option can't be effectively hedged, the price for writing these options in a way that reflects transparent speculation by a presumably sufficiently well capitalized party will likely not be insignificant. Whether home owners or originators choose to bear this risk or purchase options to transfer it to others at this market price is a matter of pricing and risk tolerance.⁵⁵ Most likely this options risk will be separated from the underlying mortgage and traded in a derivative market with a specific instrument. Policymakers should allow households to choose between loans both with and without prepayment penalties, and if they want home-owners to get the pre-payment option for free, they should budget it transparently and subsidize it directly.⁵⁶

Restoring a Competitive Market Oriented System

Public deposit protection is here to stay. Nobody is suggesting getting rid of the Federal Deposit Insurance Corporation, but public protection requires appropriate regulation.

Dueling charters are a systemic source of instability. Fannie and Freddie must go.

Whether homeownership subsidies such as the mortgage interest deduction are appropriate is an ongoing debate. Nobody is suggesting getting rid of all homeownership subsidies, but credit subsidies for low-income borrowers and other politically preferred groups should be budgeted, targeted and separated from finance.

Discrimination in lending that is not based on the ability to pay is illegal. Nobody is suggesting relaxing current anti-discrimination laws and regulations, but competition often mitigates all forms of inappropriate lending discrimination better than regulation.

Capital market financing will remain necessary. Nobody is suggesting getting rid of the FHA/Ginnie Mae program or the almost equally massive Federal Home Loan Bank System, but reforms of these programs are necessary after the housing markets recover.

Private label mortgage securitization contributed to the sub-prime lending debacle. Nobody condones the abuses, but private label securitization worked well until politically motivated regulatory distortions encouraged securitizers to bypass the private mortgage insurance industry, the traditional gatekeepers responsible for preventing excessively risky lending.

⁵⁴ Estimates are taken from the Flow of Funds Accounts, FRB.

⁵⁵ Commentators who believe that homeowners have a “right” to fixed rate mortgages with a free prepayment option fail to identify how such features are to be financed. In countries with insufficient long term savings contracts this risk is often forced on the public pensions systems, which in the US case would require their conversion to a defined contribution plan.

⁵⁶ Mandating no pre-payment penalty forces all buyers to pay for it in the fees, points and rates.

A competitive market oriented system serves qualified home borrowers and lenders best but has few political constituents. Politicians much prefer the deferred off budget costs of Fannie and Freddie even though the long run costs of delivering subsidies that way far exceed the benefits. Lacking a sufficient political commitment to a competitive market oriented model with transparently budgeted subsidies, political forces will likely align in favor of Fannie and Freddie re-incarnation or substitution of a hybrid model. This is the worst choice. A transparently budgeted government-directed model segregated from private finance would represent a giant leap backwards from the market model of an earlier era but is far preferable to recurring global financial crises spawned by GSEs and their hybrids.

The four steps necessary to restore a stable competitive market oriented housing finance system are:

1. Liquidate Fannie and Freddie: For all new mortgage purchases the traditional private mortgage insurance requirement for all loans with less than a verified 20% cash down-payment should be re-imposed and MBS required for funding, with each new MBS explicitly capitalized with Treasury preferred stock. The entire stock of outstanding debt and MBS, by now indisputably backed by Treasury in any event, should be refinanced exclusively with new Treasury debentures, giving greater control of the underlying mortgages to the enterprises to assist in the foreclosure and liquidation of the remaining assets and to facilitate the sale of operations and corporate closure.

2. Separate Enforcement of Social Goals from Prudential Regulation: The FDIC should be stripped of all enforcement responsibility for social lending goals and have final say in all matters of prudential regulation. The regulation of capital markets should be consolidated in a purely prudential regulator, the Federal Housing Finance Agency (FHFA). Enforcing social goals should be shifted from FHFA to HUD and prudential regulation of FHA and Ginnie Mae from HUD to FHFA. State insurance regulators should retain primary responsibility for oversight of the private mortgage insurance industry.

2. Establish and Enforce Appropriate and Uniform Risk-based Capital Requirements: Risk - based capital requirements should be based on the risk of the underlying mortgages rather than the financing technique chosen. The lowest requirement (50% under Basel I) should be reserved for loans with verified 20% cash down-payments--or with private mortgage insurance-- that meet strict underwriting criteria. The requirement for other loans should be higher and high risk loans—including where appropriate those underwritten to meet social goals—higher still. Capital requirements should be uniform, whether funded with deposits, covered bonds or mortgage backed securities. Policymakers are off to an auspicious start implementing a new framework for capital market financing as Basel III capital rules, covered bond rules and securitization rules have all deteriorated into independent political negotiations within the same framework of SEC sanctioned reliance on credit rating organization ratings. Either risk-based capital rules should not refer to the ratings agencies regarding MBS or the regulators will also have to regulate the raters.

4. Restore Investor Confidence and Market Discipline: Restoring investor confidence in housing finance won't be easy given the history of political risk, post debacle demagogic attacks on mortgage lenders, the accusatory legislative thrust of the Dodd-Frank Act and the wave of litigation attempting to undermine investor rights. The perceived political risk to home mortgage lending is currently greater than any time since the aftermath of the Great Depression and remains too great to attract sufficient investors without strong renewed assurances, and few investors believe that the federal government will ever withdraw its implicit backing. Hence a return to competitive private markets requires confidence building measures to reduce perceived political risk combined with an ironclad sunset on Fannie Mae and Freddie Mac. The restoration of market discipline requires a clearer delineation of government protections.

The Transition and Beyond

While this may be the best time politically to get control of the GSEs since President Kennedy's Chairman of the Council of Economic Advisors Gardner Ackley first called for this in the 1963 Economic Report to the President, it may also be the worst economic environment since then for doing so. The housing market and economy are in the worst shape since then, and Fannie and Freddie continue to deliver massive unbudgeted subsidies to home borrowers as the major instrument of current housing policy. This is compounded by today's Federal Reserve policy that is keeping mortgage interest rates at artificially low levels.

It goes without saying that both the liquidation of Fannie and Freddie and prospective future mortgage system should be designed to minimize long term direct and indirect taxpayer expense. Mortgage rates on appropriately capitalized private mortgage backed debt will be higher, reflecting the lack of an implicit subsidy from regulatory arbitrage. But the current subsidy expense has never been transparently budgeted, so separating subsidies from finance would increase the stated budget deficit while reducing taxpayer expense. Hence requiring that reform not "increase the budget deficit" by making costs transparent is another red herring. This worked spectacularly to thwart social security reform in 1982 and again in 2002 and will likely be employed once again in an attempt to maintain the status quo ante.

This is important because yields on long term fixed rate mortgages could rise by as much as 100 basis points (1%) in the short term based on the current spread between yields on GSE and non-agency jumbo market purchases, and direct subsidies may be warranted for some. But there are other ways to lower borrowing costs. A federal pre-emption of state laws banning pre-payment penalties may save borrowers that much (Hendershott and Villani, 1982). A federal pre-emption of the ban on recourse in most states could further reduce borrowing costs and would go a long way toward mitigating systemic risk. A federal foreclosure law clarifying and asserting lender property rights could further reduce lender political risk and lower borrower costs.

Post Transition Policies for the FHLBs: The FHLB System which relies on collateralized advances with full recourse generally performed admirably during the crisis, although some losses inevitably occurred. But the potential for regulatory arbitrage between and among deposits, FHLB advances and GSEs has long been recognized, as discussed in Frame and White (2004). The policy concerns regarding mortgage market "liquidity" or countercyclical support have always

been the responsibility of the FHLBs, but the last vestiges of the independent S&L system and deposit disintermediation are gone. The FHLB System arguably should have been dissolved in stead of reorganized by FIRREA in 1989. The excessive bias toward growth since access was provided to commercial banks should be addressed. Access to the Fed discount window now protects liquidity at all insured deposit institutions and the ongoing need for the FHLBs should be seriously re-evaluated once the mortgage market recovers.

Post Transition Policies for FHA/Ginnie Mae: When added to the large subsidy provided by Ginnie Mae financing, FHA will retain its monopoly advantage over private insurers in its expanded market share. Recapitalization and reform of this FHA/Ginnie Mae model should follow the transition, including lowering the qualifying house limit and limiting it to first time homebuyers.

References

Ambrose, Brent W., Michael LaCour-Little, and Anthony B. Sanders, “Does Regulatory Capital Arbitrage, Reputation, or Asymmetric Information Drive Securitization?” *Journal of Financial Services Research* 28(1/2/3):113–133, 2005.

Barth, James R., Tong Li, Wenling Lu, Triphon Phumiwanasana, and Glenn Yago, *The Rise and Fall of the US Mortgage and Credit Markets*, John Wiley and Sons, inc. 2009.

Bernanke, Ben S. “The Future of Mortgage Finance in the United States,” *The B.E. Journal of Economic Analysis and Policy* 9(3) (Symposium): Art. 2 2009

Calhoun, Charles A. “The Hidden Risks of Piggyback Lending”, Calhoun Consulting, 2005

Calhoun, Charles A. “Using HMDA Data to Analyze Piggyback Lending,” Calhoun Consulting, 2006

Blundell-Wignall, Adrian and Paul Atkinson, “The Sub-prime Crisis: Causal Distortions and Regulatory Reform,” OECD, 2008

Calomiris, Charles W and Eugene N. White, “The Origins of Federal Deposit Insurance” in *The Regulated Economy*, Goldin and Libecap ed. NBER 1994 pp 145-190.

Colton, Kent w., “Housing Finance in the United States: The Transformation of the US Housing Finance System, Harvard Joint Center for Housing Studies, 2002.

Congressional Research Service, Federal National Mortgage Association, January, 1966.

Douglas J. Elliott and Martin Neil Baily, “Telling the Narrative of the Financial Crisis: Not Just a Housing Bubble,” Brookings Institution, November 23, 2009, available at www.brookings.edu/papers/2009/1123_narrative_elliott_baily.aspx

Frame, Scott w. and Lawrence J. White, "Emerging Competition and Risk-taking Incentives at Fannie Mae and Freddie Mac, FRB of Atlanta working paper 2004-4, February 2004.

Friedman, J. A Crisis of Politics, Not Economics: Complexity, Ignorance and Policy Failure. *Critical Review*, 2009, 21, 127-183.

Gasparino, Charles, the Sellout, Harper Collins, 2009.

Gorton, Gary, "Information, Liquidity, and the (Ongoing) Panic of 2007," *American Economic Review, Papers and Proceedings*, vol. 99, no. 2, pp. 567 - 572, May (2009)

Greenbaum Stuart I. and Anjan V. Thakor, "Bank funding modes: Securitization versus deposits," *Journal of Finance Volume*, September 1987, Pages 379-401

Hendershott, Patric, Robert Hendershott, and James Shilling, *the Mortgage Finance Bubble: Causes and Corrections*, *Journal of Housing Research*, 2010.

Hendershott, Patric and Kevin Villani, "Escrow Accounts and the Value of Mortgage Servicing Contracts," *Journal of Financial Services Research*, 1994, 59-76.

Hendershott, Patric and Kevin Villani, "Housing Finance in America in the Year 2001," in Gau and Goldberg eds.), *North American Housing Markets into the 21st Century*, North-Holland; pp.181-202, (1983)

Jaffee, Dwight, Matthew Richardson, Stijn Van Nieuwerburgh, Lawrence J. White, and Robert E. Wright, "What to Do about the Government-Sponsored Enterprises?" in Acharya, Viral V. and Matthew Richardson, eds., "Restoring Financial Stability: How to Repair a Failed System," New York University Stern School of Business, 2009.

Jaffee, Dwight M. and John M Quigley, "Mortgage Guarantee Programs and the Sub-prime Crisis", *California Management Review*, Vol. 51, No. 1 fall 2008

Jones, David, "Emerging problems with the Basel Capital Accord: Regulatory capital arbitrage and related issues," *Journal of Banking & Finance Volume 24*, Issues 1-2, January 2000, Pages 35-58

Kane, Edward J., and Chester Foster, "Valuing conjectural government guarantees of FNMA liabilities," In *Proceedings: Conference on Bank Structure and Competition*. Chicago: Federal Reserve Bank of Chicago, (1986)

Lucas, Deborah and Robert McDonald, "an Option-based Approach to Evaluating the Risk of Fannie Mae and Freddie Mac, Carnegie Rochester Public Policy Conference, August (2005)

Marron, Donald and Phillip Swagel, "Whither Fannie and Freddie? "A Proposal for Reforming the Housing GSEs, Economic Policies for the 21st Century," 2010

Min, David, "the Future of Housing Finance Reform," the Center for American Progress, September (2010)

Sanders, Anthony B. and Robert Van Order, "the Government's Role in Housing and The Role of Fannie and Freddie, Dual Missions and Dueling Charters," draft, George Mason University, University of Aberdeen and George Washington University, August 2009

Silber, William L, "Why Did the Bank Holiday Succeed?" FRBNY Economic Policy Review, 19-30, July 2009.

Levitin, Adam J., Pavlov, Andrey D. and Wachter, Susan M., Securitization: Cause or Remedy of the Financial Crisis? (August 27, 2009). Georgetown Law and Economics Research Paper No. 1462895; U of Penn, Inst for Law & Econ Research Paper No. 09-31.

Partnoy, Frank, How and Why Credit Rating Agencies are Not Like Other Gatekeepers, Legal Study Paper Series, USD, May 2006.

Stanton, Thomas H. "The Failure of Fannie Mae and Freddie Mac And the Future of Government Support for the Housing Finance System", Brooklyn Law School, March 27, 2009

Poole, William. Housing in the Macroeconomy, FRB St Louis, May/June 2003.

Stiglitz, Joseph E., Jonathan M Orszag and Peter R Orszag, Implications of the New Fannie Mae and Freddie Mac Risk-Based Capital Standard, Fannie Mae Papers, Volume 1, Issue 2, March 2002.

Utt, Ronald D., The Sub-prime Mortgage Market Collapse: A primer on the Causes and Possible Solutions, Heritage Foundation, April, 2008.

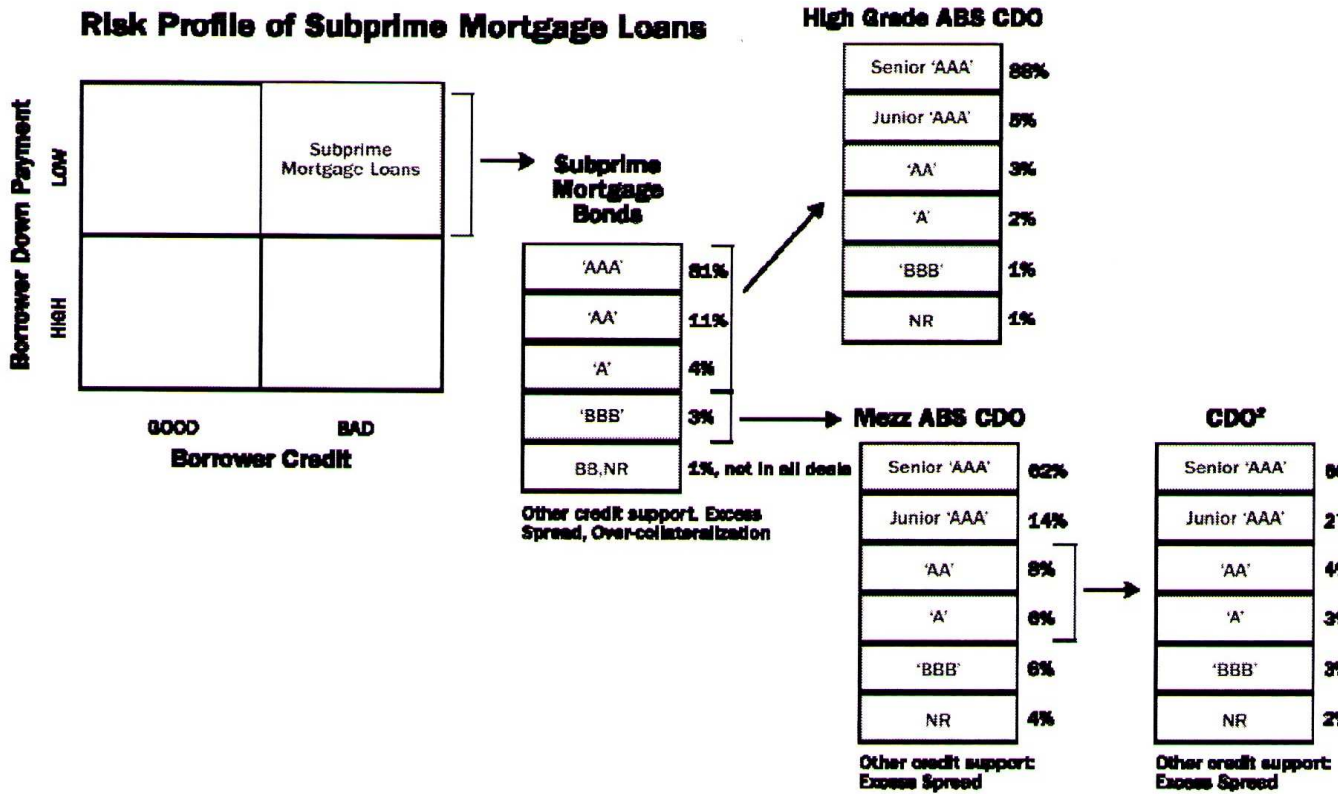
Wallison, Peter J. the True Origins of the Financial Crisis,
White, Lawrence J. "Markets: The Credit Rating Agencies." Journal of Economic Perspectives, 24(2): 211–26. 2010.

Wallison, Peter J. "Slaughter of the Innocents: Who Was Taking the Risks That Caused the Financial Crisis?" AEI, Oct-Nov 2010.

Woodward, Susan and Robert Hall, "What to Do about Fannie Mae and Freddie Mac, Financial Crisis and Recession Blog, January 28, 2009.

Appendix: Arbitrage in private Label MBS

The Figure below illustrates a typical sub-prime securitization structure.



Source: UBS, "Market Commentary," December 13, 2007.

Table 1 below calculates the weighted average regulatory capital requirements for sub-prime mortgage backed securities (MBS) based on the relative size of senior and subordinated tranches of a typical securitization structure from UBS, "Market Commentary" (December 7, 2007). There are numerous possible funding strategies, with more or less leverage, but Table 1 highlights the total capital requirements of the primary funding alternatives.

The left portion of Table 1 assumes a commercial bank retains the investment grade securities (or equivalently sells to other banks) and capitalizes them at the levels required by risk based capital rules, or alternatively finances them off balance sheet with a sponsored structured investment vehicle (SIV) that holds 1% cash in reserve. Total CDO and CDO2 refer to the net amount of capital required on the total pool after being securitized twice (MBS & CDO) and three times (MBS, CDO & CDO2) respectively. The bottom rows of the table assume that the below investment grade residual interests are funded by an investment bank (either on the

balance sheet or in a sponsored hedge fund) with leverage provided largely by a commercial bank repo or with commercial paper purchased by an SIV. We assume for illustrative purposes that the BBB and the BB can be repo'd with a 2% haircut.

Table 1 Sub-Prime MBS and CDO Capital Requirements for Retained and Sold Securitizations

	Commercial Bank Capital	Mortgage Backed Security (MBS)	CDO	Total MBS CDO	CDO2	Total MBSCDO CDO2
AAA	1.6%	81%	62%	88%	60%	88%
AA	1.6%	11%	14%	5%	27%	5.5%
A	4%	4%	8%	3%	4%	3%
BBB	8%	3%	6%	2%	3%	2%
BB	100%	.5%	6%	1%	3%	1%
NR	100%	.5%	4%	1%	2%	.5%
	Total	2.87%		3.15%		3.89%
	Investment Bank Capital					
BBB	2%					
BB	2%					
NR	4%					
Total	Balance Sheet	1.72%		1.70%		1.63%
Total	SIV	1%		1%		1%

The first source of regulatory arbitrage is illustrated in the third column, where the total required capital for an on balance sheet securitization is only 2.87%, below the 4% required for whole loans based on their 50% risk weighting. Second, with a 100% capital requirement for below investment grade retained interests, total capital rises with additional CDO securitization. So if banks were going to retain loans, MBS securitization likely pays but CDOs in this structure don't add leverage. But investment banks securitizations are more highly leveraged and CDO structures increase the allowable leverage, largely using insured bank deposits that finance commercial paper (cp) and repo lending. Combining off balance sheet SIV financing for the investment grade tranches with highly leveraged investment bank funding for the residual interests reduces total capital to about 1%.

The total capital requirement for investment bank securitizers is extremely low, about half that of banks directly, even though the banks provide the repo financing and their SIVs purchase the cp. Re-tranching not only produces a pricing advantage due to the marginally greater portion in

the highest rated securities, but the greater leverage for residual interests as well. But the basic storyline is that CDO tranching facilitated almost 94% of the underlying sub-prime mortgage loans to be rated AAA or AA with only 1.6% capital required, as compared to 4% for retained loans.⁵⁷

A hypothetical securitization of a pool of 7% coupon five year mortgages with a net of servicing coupon of 6.5% is illustrated in Table 2 based on the typical senior/sub structure with capital requirements calculated in Table 1 *without* resorting to SIV off-balance sheet financing. An investment bank is assumed to sell the investment grade tranches at the assumed yields, and

Table 2 Returns To Securitization

Rating	Yield	Net Coupon 6.5%		MBS	CDO	CDO2
AAA	4.75%	proceeds from sale		\$105.91	\$105.74	\$106.16
AA	5.2%	retained interest		1%	1.36%	1.38%
A	5.8%	return on equity@20-1	BB	140%		
BBB	6.5%		NR	340%		
BB	10%	return on equity@2-1	BB	14%		
NR	25%		NR	34%		

accrue interest on the retained BB and NR interests at their assumed yield. (Note, there is enough assumed yield in the coupon to allow for a weighted average yield on the retained interests to be over 86% in this case, but much lower rates are assumed for illustrative purposes.)

The up-front reported profit for the sold interests is about 6% of par in each case, and the return on equity for the retained interests ranges from 14% and 34% at 2-1 leverage (typical of hedge funds using bank financing) to 140% and 340% at 20-1 leverage (available to the proprietary desk of investment banks) at their assumed yields. Even if we assumed that the required yields on the investment grade tranches were 100 basis points higher across the board, the front end profits would still exceed the total value of the retained interests which could still accrue the same yields.