THREE STUDIES OF SUBPRIME AND ALT-A LOANS IN THE U.S. MORTGAGE MARKET

February 5, 2011 (updated January 6, 2015)

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Note: These three studies were first prepared in 2009 and posted on the American Enterprise Institute website in early 2010. They were initially an appendix to my chronology of US government housing policies, titled GOVERNMENT HOUSING POLICIES IN THE LEAD-UP TO THE FINANCIAL CRISIS: A FORENSIC STUDY *that was prepared for and submitted to the Financial Crisis Inquiry Commission (FCIC) in 2010. The three studies were subsequently updated with new information as of February 5, 2011. Major revisions to Studies 1 and 2 (which reported, respectively, the stock of subprime and Alt-A mortgages in the market as a whole and on the books of the federal government, including Fannie Mae and Freddie Mac) were again required from late 2011 through the date of this paper to incorporate new data made available by the Securities and Exchange Commission (SEC) on the exposures of Fannie Mae and Freddie Mac to subprime and Alt-A loans not previously disclosed, and in subsequent data releases by Fannie and Freddie themselves. Study 3 has not been revised due to the absence of additional data. In light of these extensive additional data effecting Studies 1 and 2, a preface was added. Those two studies have also been revised in minor* *respects to take account of standardization in data presentation and miscellaneous typos; the most recent revision date is noted on each study, posted at* http://www.aei.org/publication/three-studies-of-subprime-and-alt-a-loans-in-the-us-mortgage-market/. *Study 3, which sets out subprime and Alt-A mortgage originations on a flow basis since 1992, has not been updated based on the new data because of spotty availability of data covering the flow period.*

Preface to the Three Studies

The financial crisis largely stemmed from the build-up of housing credit risk that took place from the early-1990s through 2007. This is best understood when evaluated in terms of increasing borrower leverage, which consisted of at least nine forms:

A. Three types of asset leverage:
   1. **Reduced down payment on purchase loans**: this increased the asset price of a home financeable with the same level of savings and took the form of higher loan-to-values (LTVs)—that is, lower downpayments—on first mortgages and higher combined LTVs (CLTVs) on combination first and second mortgages.
   2. **Longer loan term or use of interest only (IO) period**: this kept asset leverage elevated due to the reduced buildup of earned equity through amortization during a loan's early years (see also B. 2. below).
   3. **Higher LTVs on rate and term and cash-out refinances**: this allowed borrowers to take advantage of higher home prices that result from higher leverage and the inherent weaknesses of the appraisal process, which are enhanced in the absence of an actual sales transaction..

B. Five types of income leverage:
   1. **Increase in total debt-to-income (DTI) ratio:** this increased the asset price of the home financeable with the same level of income.
   2. **Longer loan term or use of IO period**: slower loan amortization, through such devices as the 30 year mortgage, which reduces the monthly debt service costs, thus increasing the asset price of the home financeable with the same level of income.
   3. **Use of adjustable rate mortgages (ARMs) or hybrid ARMs**: these loans tended to start out at a low rate and increase over time. Since borrowers were generally qualified at a lower rate of interest, this increased the asset price of the home financeable with the same level of income. Negatively amortizing ARMs (Pay Option ARMs) allowed the increase in monthly payments to be added to the loan balance, resulting in negative amortization.
   4. **Expanded definition of eligible income to include less certain types**: this raised acceptable income levels, thereby increasing the asset price of the home financeable. An example is the variance granted ACORN which considered boarder income, voluntary child support, and energy assistance grants as income for qualifying purposes.[1]
   5. **Reduced documentation standards for income verification**: "low doc" and "no doc" fostered "liar loans" creating phantom income which increased the asset price of the home financeable.

C. One type of credit leverage:

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[1] "Study of Housing Impact Variances", Fannie Mae, May 28, 1993

Lower acceptable credit score: this increased the pool of eligible buyers. Credit risk increases if borrower credit impairment is not offset by compensating factors such increased down payment or faster amortization.

Each of these forms of expanded leverage was a departure from traditional underwriting standards present in the early 1990s.

Practices resulting in artificially lower Debt-to-Income ratios. By the early-2000s government policies led to an unprecedented increase in income leverage, exposing additional underwriting weaknesses resulting from practices which served to artificially lowered DTI ratios. Traditionally DTIs are calculated based on pre-tax income and do not take into account many normal living expenses such as income and payroll taxes, food, clothing, home utilities, cell phones, home repairs and maintenance, auto and commute expenses, child care, retirement savings, etc.[2] As is demonstrated below, a number of these ignored expenses have a direct impact on the home purchase and refinance decision and loan underwriting:

1. Cost to commute: it is a truism in real estate that the three most important things in real estate are location, location, location. The value of piece of improved land is determined by its utility. A core utility of a home is its closeness to jobs and more particularly the jobs of the household member(s). This included closeness to the type of jobs that provide adequate income relative to the expenses of owning a home. It is also well known that homes situated further out from jobs centers generally sell for less than homes closer in. This is largely due to differences in the cost of land, as closer in land tends to sell at a higher price that land farther out. DTI limits generally set the upper bound of home buyer's price category.

   Consider a home buying household consisting of two commuters who are considering two different locations:

   a. Location 1 results in two 40 mile round trip commutes for a household total of 80 miles per day or 16,000 miles based on 200 commute days per year. This adds up to $8000 per year at 50 cents per mile.[3] This is 12% of pre-tax income based on a median first-time buyer income of $67,400. At a 28% housing debt ratio (and a 41% total DTI), the maximum priced home this household would be able to purchase is $203,000.[4] While commute costs are uniformly ignored by underwriting guidelines, this household would have a 53% combined DTI and commuting expense ratio.
   b. Location 2 results in two 10 mile round trip commutes for a household total of 20 miles per day or 4,000 miles based on 200 commute days per year. This adds up to $2000 per year at 50 cents per mile.[5] This is 3% of pre-tax income based on a median first-time buyer income of $67,400. At the same 28% housing debt ratio (and a 41% total DTI), the maximum priced home this household would be able to purchase is the same $203,000.[6] This household has a 43% combined DTI and commuting expense ratio. If the same 53% combined DTI and commuting expense

[2] Starting in 1936 the FHA used a residual income (RI) approach (followed by the VA in 1946) that takes into account some of these expenses. The VA continues to use the RO approach, while the FHA abandoned it sometime during or later than the 1960s. Fannie Mae and Freddie Mac have never applied the RI approach to conventional lending.
[3] The IRS' standard mileage rate for the cost of operating a car for business use is 56½ cents per mile.
[4] Based on a 30 year fixed rate loan at 6% and a 28% housing debt ratio and a 41% DTI (FHA's current averages).
[5] The IRS' standard mileage rate for the cost of operating a car for business use is 56½ cents per mile.
[6] Based on a 30 year fixed rate loan at 6% and a 28% housing debt ratio and a 41% DTI (FHA's current averages).

ratio were applied to Location 2 as for Location 1, this household would qualify for a $269,000 home, 17% higher than when commuting costs are ignored.

This impact of this underwriting flaw would be magnified by rising fuel costs in the early-2000s. The cost of gasoline rose from $1.43/gallon in 2004 to $4.10/ gallon in 2008. This would impact default rates in areas like Riverside-San Bernardino, CA.[7]

2. The traditional DTI methodology used by all extant underwriting approaches other than the VA also ignore utility costs and the expected costs of maintenance and repairs. Ignoring the expense variances that occur from home to home is yet another way to increase leverage.

Affordable housing goals. Starting in 1992, Congress mandated and HUD implemented policies to promote the use of expanded leverage to increase the home ownership rate particularly among lower income buyers. During the long run-up to the financial crisis, different market players reacted differently in how each used expanded leverage in response to this mandate and the resulting competitive pressures:

A. Fannie and Freddie (the GSEs), subjected to HUD enforcement of congressionally required affordable housing (AH) mandates, were market leaders in acquiring whole loans that relied heavily on reduced down payment lending, increased high DTIs, reduced income documentation, an expanded definition of eligible income, longer loan terms, use of the IO feature, the use of adjustable rate and hybrid adjustable rate features (but not a great reliance on Pay Option ARMs), and higher LTVs through rate and term reductions and cash-out refinances. While the GSEs also increased their acquisition of loans with lower credit scores, they acquired many more of these loans in the form of subprime private mortgage backed securities (PMBS) and were the largest investors in these securities.

   The original Three Studies detailed the GSEs' role in acquiring subprime mortgages and Alt-A loans. Their Alt-A lending consisted of reduced down payment lending, reduced income documentation lending, interest only loans, ARMs, hybrid ARMs, and relatively small volumes of Pay Option ARMs. However, it took an investigation by the SEC and an FHFA directive to get the GSEs to release substantial (but still not complete) loan performance data, and to disclose their substantial use of increased subprime lending, increased DTI lending, additional reduced income documentation lending, and higher than traditional LTVs on rate and term and cash-out refinances.

B. FHA, in an effort to lead the market and respond to competition from the GSEs (as they complied with AH quotas), relied even more heavily on reduced down payment lending, lower credit scores, higher DTIs, and higher LTVs on rate and term and cash-out refinances.

C. Banks, complying with Community Reinvestment Act (CRA) mandates and responding to the GSEs' loosened lending standards undertaken to comply with Affordable Housing mandates imposed by HUD, also began to use reduced down payments lending, lower credit scores, higher DTIs, and an expanded definition of eligible income.

[7] How High Gas Prices Triggered the Housing Crisis: Theory and Empirical Evidence, 2012, http://works.bepress.com/sexton/29/

D. From the early-1990s through 2003, the GSEs continuously expanded their market share, relying heavily on their ability to acquire trillions of dollars in non-traditional expanded leverage loans. The private sector was unable to compete with the implicit federal guarantee of the GSEs together with the regulatory and capital advantages provided by the government. A central feature of the GSEs' duopsony was their ability to outbid virtually all competitors in the acquisition of low risk or prime loans. Evidence of this is the fact that the GSEs' only competition came from the Federal Home Loan Banks' (FHLBs) Mortgagee Partnership Finance program. Of course the FHLBs are themselves another form of government sponsored enterprise with an implicit guarantee.

Traditional or self-denominated subprime lenders had a fairly static market share of 7-10% from the early-1990s through 2003. This does not mean that loan credit quality was static. Like the FHA, to maintain their market share, subprime lenders were forced to rely more on reduced down payment lending, lending to borrowers with even lower credit scores and even higher DTIs.

Since the mid-1980s the charter advantages enjoyed by Fannie and Freddie made it virtually impossible for the private sector to compete head to head with them. Overcoming the GSEs' benefits of high leverage, low borrowing cost, and implicit government guarantee had, for decades, proved insurmountable. As a result, the private sector lost market share to Fannie and Freddie during this period. At the same time, the risk level of the GSEs' business was increasing, requiring the private sector to move even further out the risk curve to maintain what share it had. By late-2003 issuers of PMBS, particularly for subprime PMBS, had developed collateralized debt obligations (CDOs) and CDOs squared, to level the capital playing field with Fannie and Freddie and thus take back some market share.[8]

[8] See detailed discussion of this development in Pinto, *Government Housing Policies in the Lead-up to the Financial Crisis: a Forensic Study*, supra.

Study 1 with corrections and edits through January 6, 2015

Sizing Total Exposure to Subprime and Alt-A Loans in U.S. First Mortgage Market as of June 30, 2008

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This study outlines in detail how I calculated the total number of subprime and Alt-A loans outstanding in the U.S. financial system on June 30, 2008 (unless otherwise noted).

Section A: Definitions

Up until 2013, the U.S. did not have a standardized system for reporting on mortgage quality.[9] One of the reasons for confusion about the number of subprime and Alt-A mortgages outstanding at any time in the U.S. is that many of the participants and reporting agencies used different definitions of the same terms. In many cases, these definitions did not classify subprime and Alt-A loans based on objective risk characteristics but on the basis of how the lender or securities issuer classified a loan. For example, before its insolvency in 2008 and its takeover by the FHFA as its conservator, Fannie Mae classified a loan as subprime if the mortgage was originated by a lender specializing in the subprime business or by subprime divisions of a large lender.[10] This had the effect of reducing its subprime loan count so that it rounded to zero.

In addition, when the Federal Reserve studied the performance of CRA loans, they defined them as subprime if they were reported as high interest loans under the Home Owners Protection Act (HOPA); this excluded a very large number of CRA loans that did not carry interest rates that fell into the HOPA category. The result was again that a very small number of CRA mortgages were defined as subprime. At the same time, the risk characteristics and performance of CRA loans went largely unreported. Additionally as noted in the Preface, increases in leverage of all kinds were endemic across all defined product types.

In this Study, I use the objective risk characteristics as were in use in the mortgage industry for traditional prime, subprime, and FHA loans around 1990 to determine whether a loan should have been considered subprime or Alt-A (subprime and Alt-A are sometimes referred to in the Three Studies as non-traditional mortgages (NTMs)). Correspondingly, a mortgage that conforms to traditional underwriting standards is called a traditional or prime loan. The benchmark for a prime loan is a Fannie Mae 1992 random sample review (the Fannie Random Sample Review covering

[9] In December 2013, the American Enterprise Institute's International Center on Housing Risk (of which I am the codirector) began publishing the National Mortgage Risk Index (NMRI), which places loans in objective risk buckets using a transparent methodology. Each loan's default risk is assessed based on performance of 2007 vintage loans with similar characteristics. Currently the NMRI covers nearly government guaranteed mortgages for home purchases (about 85% of all purchase loans). There are plans to expand coverage to include non-agency loans, refinances, and second mortgages in 2015.

[10] In November 2008, Fannie acknowledged that it had "other loans with some features that are similar to Alt-A and subprime loans that [it had] not classified as Alt-A or subprime because they do not meet [its] classification criteria. See P. 182 of Fannie's Q.3:2008 10-Q

loans acquired by it from 1988-1991[11]) of the characteristics of the loans in Fannie Mae's mortgage portfolio.[12] These characteristics determined what was considered a prime mortgage at the time (referred to in these Studies as the Base Period). It consisted generally of a good credit record (now reflected in a FICO score greater than 660), a 10 percent or greater downpayment on home purchase loans (an LTV no greater than 90 percent), an LTV and/or combined LTV on rate and term refinances that did not exceed 80%, an LTV and/or combined LTV on cash out refinances that did not exceed 75%, and a DTI ratio that did not exceed 38 percent. In general, mortgages that did not meet these standards or had other deficiencies outlined below would be considered NTMs and would not be acquired by the GSEs. Indeed, the definition of a subprime loan was often given as a loan the GSEs would not buy.

Definitions of the various types of NTMs follow:

Subprime Loans:[13] In general, these are loans to borrowers with "weakened credit histories that include payment delinquencies and possibly more severe problems such as charge-offs, judgments, and bankruptcies."[14] There are two varieties of subprime loans:

Self-denominated Subprime (SD Subprime): These are loans denominated or classified as subprime by the originator or the securities issuer and had one or more of the following characteristics:

1. Originated by a lender specializing in subprime business or by subprime divisions of large lenders;
2. Placed in a subprime private MBS (Subprime Private MBS); or
3. Had a rate of interest considered "high" under HOPA.

Not Initially Classified as Subprime or Subprime by Characteristic: These are loans with a FICO score of less than 660.[15] While FICO credit scores became available for use in mortgage

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[11] Fannie Mae Random Sample Review, prime loan characteristics are from a random sample review of Fannie Mae's single-family acquisitions for the period October 1988-January 1992, dated March.10.1992. Document contained in the author's files.

[12] In March 1992, Fannie Mae completed a study of approximately 26,000 randomly selected loans in its portfolio (the Fannie Mae Random Sample Review). The objective was to determine the borrower characteristics that were correlated with the presence or absence of serious delinquencies. The study showed that 94 percent of the loans had LTV ratios of 90 percent or below (i.e., at least 10 percent downpayments), while only six percent had LTV ratios of greater than 90 percent. Total debt-to-income (DTI) ratios were also low; 85 percent of borrowers had a total DTI no higher than 38 percent. Credit records were excellent; although FICO scores were not in use at this point, over 98 percent of the borrowers had no mortgage late payments in any year and 99.5 percent had at most one late mortgage payment. Fannie Mae, "Serious Delinquencies by Demographic Characteristic," March 1992, Document in author's files.

[13] In 1990 one of the characteristics of a GSE or prime loan was a DTI that generally did not exceed 38% (offsetting or compensating factors might allow this to be increased to 39-41%. Thus none exceeded 41%. As a result, one of the characteristics of the best grade of subprime loan was a DTI just above the leval acceptable to the GSEs, generally defined as,a DTI <45% (worse risk grades consisted of DTIs <50%, <55%, etc.). However, by 1997 13 percent of the GSEs DTIs were greater than or equal to 42%--loans that would have been characterized a subprime in 1990. By 2007 43 percent of the GSEs DTIs were greater than or equal to 42%--- again these would have been characterized a subprime in 1990. Thus from the mid-1990s on the GSEs were squarely in competition with traditional private subprime lending. For purposes of the Three Studies, GSE loans with DTIs in excess of traditional levels in 1990 are characterized as Alt-A loans. The term subprime is reserved for loans denominated as such or loans with impaired credit (as evidenced by a FICO score below 660).

[14] See Appendix 1

[15] In the 1980s and early-1990s a private subprime loan was defined as one that exceeded GSE (prime) credit or debt-to-income standards. At this time credit was not a competitive factor between the GSEs and private subprime: while only 2% of Fannie's borrowers in the late-1980s/early-1990s had one or more 30 day mortgage late payments (this is prior to

lending in 1989. At that time 13-14% of all new mortgages had FICOs below 660.[16] While FICO scores did not come into general use in mortgage lending until the mid-1990s, industry segmentation by credit attributes and market shares indicate that these loans would have been almost exclusively done by FHA and private subprime as these two channels, with 23 percent market share in 1990, served borrowers with impaired credit.[17] At the same time Fannie and Freddie, based on borrower credit characteristics set forth in Fannie's Random Sample Review for 1998-1991 acquisitions, served prime borrowers and would have accounted for few of these loans. The formal use of a 660 FICO score as the demarcation line between prime and subprime loans goes back to 1995. As noted in January 1997 by Standard & Poor's, "…a FICO score of 660 [is] the investment-grade score as defined in Freddie Mac's industry letter of August 1995."[18] In 2001 federal bank regulators issued "Expanded Guidance for Subprime Lending Programs" which set forth a number of credit characteristics for subprime borrowers including:

> "Relatively high default probability as evidenced by, for example, a credit bureau risk score (FICO) of 660 or below (depending on the product/collateral).[19]

In 2009, both GSEs implicitly acknowledged the 660 FICO demarcation point when they indicated in the credit supplements to their quarterly and annual reports that certain key risk characteristics had a high likelihood of default.[20] Fannie, for example, lists risk characteristics and related serious delinquency (SD) rates for FICOs of <620 (16.08% SD) and FICOs of 620-659 (11.32% SD). Other high volume high risk categories listed include interest only loans (17.94% SD), Original LTV >90% (11.56% SD), and Alt-A (13.97% SD).[21] Fannie's SD rate on its traditionally underwritten loans (those loans without any of these high risk characteristics) is 1.78%.[22] According to Fannie's 2009 Credit Supplement, loans with a FICO of <620 and 620-659 had a default probability 9 times and 6.4 times, respectively, the default probability of traditionally underwritten loans.

Alt-A Loans: These loans either had low or no documentation requirements or had some feature that was "alternative to agency" (hence, "Alt-A")—i.e., did not meet the traditional underwriting guidelines of the GSEs in such characteristics as Original LTV, Combined LTV, debt-to-income (DTI) ratio, rules for loans on investment properties, rules on cash-out refinances, condominium guidelines, special income definitions, low start rates, or negative amortization ARMs. Tracking

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broad use of FICO credit scores, but a high preponderance of these GSE loans would have had a FICO score of greater than 660); the best subprime grade ("A-") allowed for two 30 day mortgage late payments in 1997 (earliest data found), "B" grade loans could have three such 30 day late payments, "C" grade loans could have four such 30 day late payments and one 60 day late payment, "D" grade loans exceeded the requirements for a "C" loan.. Likewise, at this time total debt-to-income (DTI) ratios were not a competitive factor between the GSEs and private subprime: according to a Fannie Mae Random Sample Review (discussed in detail elsewhere), in the late-1980s/early-1990s, Fannie had no loans with a total DTI ratio equal to or in excess of 42% while the maximum total DTI ratios for private subprime were <45%, 46-50%, 51-55%, and 56-60% for "A-", "B", "C" and "D" grades respectively in 1996. Private subprime did not compete with FHA because private subprime had an average loan-to-value ratio in 1995 (earliest date found) of 76% while FHA's median in 1991was about 95%.

[16] Source: From Equifax FICO odds charts contained in the author's files.

[17] Inside Mortgage Finance

[18] S&P Structured Finance Ratings, January 1997, p. 14

[19] See Appendix 1.

[20] Fannie Mae 2009 Third Quarter Credit Supplement, p. 5, found at: http://www.fanniemae.com/ir/pdf/sec/2009/q3credit_summary.pdf and Freddie Mac Third Quarter Results Supplement p. 18 found at http://www.freddiemac.com/investors/er/pdf/supplement_3q09.pdf

[21] Fannie Mae 2009 Third Quarter Credit Supplement, p. 5

[22] Id. Derived from data found on p.5

this category was made more difficult because the GSEs increased their "acceptable" DTI ratios starting sometime after 1990 (this date is known from the earlier referred to Fannie Random Sample Review) and before 1997 (this is first date for which broad GSE DTI data are available and these data already show a substantial increase in DTIs as of 1997). This increase in GSE DTIs blurred one of the traditional the demarcation lines among traditional prime, private subprime, FHA, and Alt-A.[23] According to the Fannie Random Sample Review), in 1990 virtually none of Fannie's loans had a total DTI ratio greater than or equal to42 percent. As noted earlier, by 1997 this had risen to 13 percent for the GSEs, putting the GSEs squarely in competition with traditional private subprime lending (derived from data relating to fully documented GSE loans released by the Consumer Financial Protection Bureau).[24] A similar degradation of standards occurred with respect to the acceptable LTV and combined CLTV limits for purchase, cash out and no cash out refinances and combination loans (loans with a combination first and second mortgage, many times acquired by different investors).

To address this gradual but uninterrupted trend toward increased leverage, I define Alt-A loans in relation to their deviation from traditional underwriting in the late 1980s and the early-1990s (the Base Period), as exemplified in the Fannie Random Sample Review. It is the wholesale abandonment of traditional underwriting standards that fueled the housing boom, the subsequent bust, and led to the financial crisis and the ensuing Great Recession.

There are two varieties of **Alt-A Loans**:

Self-denominated Alt-A or SD Alt-A: Loans initially classified as Alt-A generally had one or more of the following characteristics:

1. A loan initially classified it as Alt-A based on documentation or other features, or
2. A loan placed in a private MBS denominated as an Alt-A Private MBS.

Not Initially Classified as Alt-A or Alt-A by Characteristic: Loans not initially classified as Alt-A which had:

1. Non-traditional ARM terms such as low start ("teaser") rates or no amortization (interest only) or negative amortization. These could be in either private MBS or whole loans;
2. Home purchase loans:
    a. High Original LTV[25] including 97% Original LTV and 100% Original LTV loans, along with 95% Original LTV loans with non-traditional underwriting standards and debt rations in excess of 38 percent debt ratios. For the period in question, virtually all Original LTV >90% lending had one or more of these characteristics. This lending may also be referred to as Original LTV >90%. During the Base Period, while 9% of Fannie loans had an LTV of 95%, few , if any, would have had a Total Debt-to-Income (DTI) ratio greater than 38 percent and none had an LTV greater than 95%; or

[23] See footnote 10.

[24] DTI distributions derived using interpolation and extrapolation of data contained in the Consumer Financial Protection Bureau's request for further comment on Ability-to-Repay mortgage rule dated May 31, 2012. Dataset consists of fully documented income loans that are fully amortizing with a loan term <=30 years. For this data set, the maximum DTI grouping is "=>46%" which constituted 31% of sampled loans. http://files.consumerfinance.gov/f/201205_cfpb_Ability_to_Repay.pdf

[25] "Original loan-to-value" or "Original LTV": the loan-to-value relationship at the time of loan origination of the first mortgage and the value of the home being financed.

b. High Combined LTV[26] where a combined 1st and 2nd lien was used to reduce the down payment required. This lending commonly involved an 80% first lien and a 20% second. This lending may also be referred to as Combined LTV >90%. During the Base Period, only 4 percent of Fannie loans had a combined 1st and 2nd lien and few, if any had a CLTV >90%.

3. Rate and term refinance loans where the interest was reduced or the term reduced; 7% of Fannie's acquisitions had an original LTV or CLTV greater than 80 percent during the Base Period.[27]
4. Cash taken out (cash-out) when loans were refinanced; where, during the Base Period, 1% of the GSEs' acquisitions had an original LTV or CLTV greater than 80 percent.[28]
5. Total Debt-to-Income (DTI) ratios greater than or equal to 42 percent. During the Base Period, few, if any, Fannie loans had a DTI greater than or equal to 42 percent.

In 2011 the Securities and Exchange Commission entered into Non-Prosecution Agreements with Fannie Mae and Freddie Mac (NPAs). These agreements for the first time disclosed additional Alt-A acquisitions by the GSEs.

In 2012 Fannie Mae and Freddie Mac disclosed detailed loan performance data on a subset of its loan acquisitions covering 1999 (partial for Fannie) through 2011. These data allowed for the calculation of additional Alt-A loans acquired by the GSEs for the first time.

FHA, VA, and Rural Housing Loans: For the 2002-2007 loan books, approximately 83% of FHA loans consisted of High Original LTV lending (Original LTV>90%) and approximately 70% had a FICO of <660[29]. FHA is projecting a 21% and 24% claims rate[30] for its 2006 and 2007 book years respectively. While similar data is not available for the smaller volume VA and rural housing loan programs, Original LTV distributions are believed to be similar.

Section B: Summary of overall market exposure to subprime and Alt-A loans

In addition to no standardized system of definitions of mortgage quality, the U.S., up until 2013, had no single place where data on the numbers of mortgages as well as their quality are kept. Accordingly, in order to develop a comprehensive number for NTMs such as subprime and Alt-A mortgages I had to compile and conform data from several different sources. Based on the disclosures in these sources and the definitions above, I estimate that the total exposure of the market to subprime and Alt-A loans as follows:

Table 1: Overall market exposure to subprime and Alt-A loans as of 6.30.08:

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26 "Combined loan-to-value" or "Combined LTV": the loan-to-value relationship at the time of loan origination of the combined amounts of first mortgage and second mortgage and the value of the home being financed.

27 This was the percentage found for Fannie's acquisitions during the Base Period of 1988-1991.

28 This was the percentage found for Fannie's acquisitions during the Base Period of 1988-1991.

29 Data in or derived from 2009 Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund, pp. 42 and 44

30 Id. Found at Appendix F-3. FHA insures loans against loss from default. When there is an insured loss, FHA pays a claim. Losses generally result from a foreclosure. FHA keeps track of the claims it pays or expects to pay by projecting a claims rate for each book year of insured loans. A projected claims rate of 24% means that FHA expects to pay 24 claims for every 100 loans insured.

Section with detail*	Subprime and Alt-A Loans	Net $ in trillions	Net number of loans in millions (net of any overlap)[31]
	Subprime	**$2.577**	**16**
C. 1.	Self-denominated	*$1,196*	*6.7*
C. 2.	Subprime by Characteristic	*$1,378*	*9.2*
	Alt-A (exc. loans included above)	**$2.828**	**15 (rounded)**
D. 1.	Self-denominated Alt-A Private MBS	*$0.640*	*2.1*
D.2.	Fannie Alt-A of all types (excluding purchases pertaining to D. 1)	*$0.960*	*5.8*
D. 2.	Freddie Alt-A of all types (excluding purchases pertaining to D. 1)	*$0.668*	*4.6*
D. 3.	FHA/VA Alt-A	*$0.160*	*1.4*
D. 4.	Other conventional Alt-A	*$0.400*	*1.3*
	Total	**$5.4 (rounded)****	**31 (rounded)**

*Within each section, the text setting out the concluded net dollar amounts and net number of loans for each loan type is bolded.
**This total differs slightly from the total of $5.3 trillion set forth in Study 2, Table 1. This is due to this Study and Study 2 using different methodologies and data sources along with rounding.

Based on Table 1 above, the totals for Subprime or Alt-A loans and their percentages of all first mortgages are as follows:

> **By number:** Fifty-six percent of the 55 million first mortgages are Subprime or Alt-A (31 million of 55 million).
>
> **By dollars:** Fifty-seven percent of the $9.42 trillion in outstanding first lien mortgages are subprime or Alt-A ($5.4 trillion/$9.42 trillion).

Note: When the Three Studies were initially published, I used the methodology described below to compute the total number of NTMs outstanding on June 30, 2008, and estimated the number at 26.7 million loans, or 49% of the 55 million mortgages outstanding. Subsequent disclosures by the GSEs—in the Non-Prosecution Agreements with the SEC[32] and the GSEs' release of detailed loan origination characteristics in a subset of their June, 2008 stock of loans—required that the loan

[31] The net number of loans takes into account that some loans have multiple product features. The net number counts a loan only once even if it is included in multiple categories. For example, this listing starts with subprime loans. Since Self-denominated Subprime and Subprime by Characteristic do not overlap, the gross and net totals are identical. By way of further example, a portion of Alt-A loans have a FICO below 660 and are already included in Subprime by Characteristic. This results in a reduction in the gross number of Alt-A loans.
[32] In December 2011, the SEC charged three former top officials of both Fannie and Freddie with failure to disclose the GSEs' acquisition of large numbers of loans that should have been characterized as subprime or Alt-A. In connection with the SEC suit, both GSEs conceded in non-prosecution agreements the accuracy of the SEC's allegations and the SEC's accounting of the number of the undisclosed loans. See Non-Prosecution Agreement between Fannie Mae and the Securities & Exchange Commission, dated December 13, 2011. See also Non-Prosecution Agreement between Freddie Mac and the Securities & Exchange Commission, dated December 13, 2011

totals in Table 1 above be increased to 31 million from 26.7. Below, I show the methodology for the initial estimate of 26.7 million loans, followed by the additional amounts that the subsequent disclosures required.

The number of outstanding first mortgages is estimated at 55 million and was derived from the National Delinquency Survey (NDS) of the Mortgage Bankers Association (MBA).[33] The NDS contains 45.4 million first mortgages, covering about 80%-85% of outstanding first-lien mortgages. This yields a total of 55 million first lien loans.[34] The Federal Reserve reports that the dollar amount of outstanding first lien mortgages at 6.30.08 was $9.42 trillion.[35]

> **By number:** Forty-nine percent of the 55 million first mortgages are Subprime or Alt-A (26.7 million of 55 million).
>
> **By dollars:** Forty-nine percent of the $9.42 trillion in outstanding first lien mortgages are subprime or Alt-A ($4.622 trillion/$9.42 trillion).

In the balance of this Study, I will show how these totals were developed.

Section C. Detail of market exposure to subprime

1. **Sources of information used to determine self-denominated subprime exposure as of 6.30.08:**

   Two sources were used to estimate Self-denominated Subprime market exposure and within this category Self-denominated Subprime and Self-denominated Subprime Private MBS (PMBS). The first source provided an average loan amount and served as the secondary data source for total Self- denominated Subprime loans outstanding. The second source served as the primary data source for total Self- denominated Subprime Loans outstanding.

   a. The Fed Reserve of NY maintains a database on subprime loans.[36] The data in this Study was accessed in the fall of 2008.

      The NY Fed's database of subprime loans is based on Loan Performance Corporation's subprime database (LP Subprime Database) and consists of both self-denominated subprime loans and self-denominated Subprime Private MBS. While a FICO score below 660 is a significant determinant (an estimated 71% of such loans have such a FICO), there are other characteristics used in this self-determination. The NY Fed defines Subprime as:

[33] National Delinquency Survey, Mortgage Bankers Association, Q208

[34] Over the period Q.1:08 to Q.3:09, the MBA has reported that it covers over 80% of outstanding first-lien mortgages, between 80% and 85% of outstanding first-lien mortgages, and approximately 85% of outstanding first-lien mortgages. The total number of loans reported by the NDS varies by no more than 800,000 over this time period, indicating that the variance in the total number of mortgages outstanding over this period was at most 1 million loans. Using a midpoint of 82.5% coverage and 45.4 million first mortgage loans covered by the Q.2:08 survey yields a total of 55 million first lien loans.

[35] Fed Flow of Funds report, Chart L.218, Line 2, Household sector home mortgage liabilities http://www.federalreserve.gov/releases/z1/Current/z1.pdf

[36] NY Fed subprime database found at http://data.newyorkfed.org/creditconditions/

> "Compared with prime mortgages, subprime mortgages are typically made to borrowers with blemished credit history or who provide only limited documentation of their income or assets. Originations of subprime mortgages fell sharply in the second half of 2007 and have been extremely light so far in 2008. Of the 3.3 million active subprime loans in the data at the end of 2007, there were some 3 million loans for owner-occupied units with an average outstanding loan balance around $180,000."[37]

It further adds:

> "The underlying data do not represent every subprime mortgage, whether in portfolio or in a security or mortgage securitized in an alt-A pool. We estimate that as of year-end 2007, there were about a total of 7 million subprime loans. The underlying data contained 3.3 million active subprime loans, suggesting a coverage ratio of 47 percent."

The NY Fed database indicates that the average Self-denominated Subprime loan balance is $178,000.[38] Using the 7 million loan total times $178,000 yields $1.25 trillion in total Self-denominated Subprime loan balances at year end 2007.

b. The total of 7 million Self-denominated Subprime loans from the NY Fed data base was compared to the MBA's NDS. The NDS reported 5.541 million Self-denominated Subprime loans at 6.30.08 and 5.542 million Self-denominated Subprime loans at 3.31.08. The MBA notes that its database captures 80%-85% of all loans. Using the mid-point of 82.5% results in an MBA estimate of 6.7 million subprime loans. Using the same $178,000 per loan noted by the NY Fed yields $1.19 trillion. The MBA data is as of 6.30.08 while the NY Fed data is as of 12.31.07. Given that few new subprime loans were originated after Q.2:07, a minor amount of runoff would be expected. **For purposes of this analysis, the estimate based on NDS data of 6.7 million Self-denominated Subprime loans and a gross and net amount of $1.19 trillion in outstanding loans will be used.** As this is the first category examined there is no opportunity for overlap, therefore the gross and net dollars of outstanding loans are identical.

c. The number of Self-denominated Subprime loans which were security for Self-Denominated Subprime Private MBS was developed from an evaluation of Self-Denominated Subprime Private MBS issuances as a percentage of total Self-Denominated Subprime loan originations. Over the period 2004-2007, 82% of Self-Denominated Subprime loan originations were securitized into Self-Denominated Subprime Private MBS issuances[39]. This percentage was then applied to the 6.7 million Self-denominated Subprime loans with the average loan size assumed to also be $178,000. This resulted in 5.5 million loans being contained in Self-Denominated Subprime Private MBS issuances with outstanding issuances at 6.30.08 totaling $0.98

[37] http://www.newyorkfed.org/regional/techappendix_spreadsheets.html#sub_loans
[38] NY Fed subprime database found at http://data.newyorkfed.org/creditconditions/
[39] Inside Mortgage Finance "The 2009 Mortgage Market Statistical Annual" pages 3 and 4.

trillion. Since these amounts are a subset of Self-denominated Subprime loans, they are not listed separately in Table 1.

2. **Sources of information used to determine Subprime by Characteristic exposure among loans not classified as subprime (there is no overlap with Self-denominated Subprime):**

   Loan Performance Corporation also maintains a prime loan database (LP Prime Database). The LP Subprime Database and LP Prime Database are mutually exclusive.[40] All Fannie and Freddie loans (regardless of FICO or other loan characteristics) are reported into the LP Prime Database only.[41] The LP Prime Database was set up in 1989 before the use of FICOs, which were developed in 1989 and did not come into general use in the mortgage industry until 1995. The LP Prime Database was populated by loans reported by prime loan servicers or investors such as Freddie (starting in 1989) and Fannie (starting in 1991). Thus the LP Prime Database is a mix of Fannie and Freddie loans, other conforming loans, prime jumbo loans, and FHA and VA loans.[42]

   a. An estimated 20% or **8.8 million** loans out of the LP Prime Database's grossed up total of 44 million loans have a FICO below 660 and are denominated herein as Subprime by Characteristic.[43]

      To convert the 8.8 million subprime loans contained in the LP Prime Database to dollars, an average loan amount of $150,000 was used.[44] **This yields $1.32 trillion ($150,000 x 8.8 million loans) in gross and net dollars of Subprime by Characteristics loans.** The number and dollar amount of Subprime by Characteristic loans does not overlap

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[40] This was confirmed in a conversation with Dan Feshbach founder of Loan Performance Corp.

[41] Id.

[42] Loan Performance reported (when accessed in the fall of 2008) that the LP Prime Database has "[L]oan-level data on over 75% of the nation's active first mortgages—more than 38-million—including all of the Fannie Mae and Freddie Mac portfolios." This results in an estimate of 51 million first mortgages. Netting out an estimated 7 million SD Subprime mortgages yields 44 million prime mortgages. This total of 51 million first mortgages compares favorably to the MBA's estimate of 53 million first mortgages.

[43] Percentage of prime loans with a FICO <660 derived from Figure 1 (p.3) "Surprise: Sub-Prime Mortgage Products are not the Problem!" found at http://www.milkeninstitute.org/publications/view/330 . This top down estimate may be confirmed as reasonable by comparing to the number of below 660 FICO score loans acquired and held by Fannie or Freddie at 6.30.08 (4.544 million from Appendix 2 to Study 1) and the number of <660 FICO score loans guaranteed or insured by the FHA or the VA at 6.30.08 (FHA: 2.961 million and VA: 0.68 million from Study 2, Section E, 1. Seventy and 50 percent of FHA and VA loans respectively were estimated to have a FICO score below 660. This totals 8.185 million for Fannie, Freddie, FHA, and VA. As noted earlier, all Fannie, Freddie, FHA, and VA loans tracked by Loan Performance were reported in the LP Prime Database. At 6.30.08 Fannie, Freddie, FHA, and VA loans totaled 24.6 million or 56 percent of the 44 million loans reported as prime mortgages (as noted above). Non-agency loans reported as prime would have accounted for the remainder of prime loans with a FICO credit score below 660. These loans largely would have been comprised of traditional prime loans (both in private portfolios and private MBS), along with Alt-A loans held in private portfolios and private MBS, all of which would have had low percentages of borrowers with FICO scores below 660.

[44] Fannie and Freddie account for 4.554 million loans with a FICO <660 (see Appendix 2 to Study 1). These loans have an average loan amount of $137,570 (see Appendix 2).These loans represent 52% of the 8.8 million Subprime by Characteristic loans. The other 48% are a mixture of many loan types including FHA (whose loans have an average loan balance $103,300 - and jumbo loans (with much higher balances than the GSEs). FHA's average loan amount is derived from the FHA Biweekly report for July 16-31, 2008 found at http://www.hud.gov/offices/hsg/comp/rpts/ooe/ol2009.pdf.

with the number and dollar amount of Self-denominated Subprime loans. Therefore the gross and net dollars of Subprime by Characteristic loans are identical.

Section D. Detail of market exposure to Alt-A.

1. **Source of information used to determine Alt-A in Private MBS exposure:**

   a. The Fed Reserve of NY maintains a database on Alt-A loans.[45] The data in this Study was accessed in the fall of 2008.

   The NY Fed defines **Alt-A** as**:**

   > **"Alt-A Mortgages defined:** Loans marketed in alt-A securities are typically higher-balance loans made to borrowers who might have past credit problems—but not severe enough to drop them into subprime territory—or who, for some reason (such as a desire not to document income) chose not to obtain a prime mortgage. In addition, many loans with nontraditional amortization schedules such as interest only or option adjustable rate mortgages are sold into securities marked as alt-A."

   It further adds:

   > "Our best guess is that 2.4 million loans in this portion of the data cover more than 90 percent of the pools marketed as alt-A. The loan data are drawn from reports by the Board of Governors of the Federal Reserve System based on data from FirstAmerican CoreLogic, LoanPerformance Data. Data on the number of housing units are drawn from the U.S. Census 2000." and
   >
   > "Although the term "alt-A" applies technically only to securities, not mortgages, it has become common practice to refer to near-prime or non-traditional mortgages as "alt-A" loans. The 2.4 million Alt-A loans in the data contained approximately 1.7 million loans for owner-occupied units with an average outstanding loan balance around $300,000 at the end of 2007."

   Applying the 90% Alt-A private MBS market coverage to the 2.4 million loans noted above yields 2.67 million in Alt-A Private MBS. Based on the average loan balance of $300,000 also noted above, yields $0.80 trillion Alt-A Private MBS. Note: the MBA's NDS does not have a separate category for Alt-A (they are classified as prime loans). In addition, the NY Fed database does not include either Fannie or Freddie's Self-Denominated Alt-A loans or Alt-A Loans by Characteristic.

   The number and dollar amount of Alt-A Private MBS do not overlap with the number and dollar amount of Self-denominated Subprime loans but do overlap with Subprime by Characteristic. This is due to the fact that the Alt-A loans within Alt-A Private MBS were reported as prime loans in the LP Prime Database. This overlap is 19.5%.[46] **The**

[45] NY Fed Alt-A database found at http://data.newyorkfed.org/creditconditions/

[46] NY Fed Alt-A database indicates that 80.5% of Alt-A loans have a FICO>660. As a result, the overlap with Subprime by Characteristic is 19.5%. http://data.newyorkfed.org/creditconditions/

gross and net dollars of Alt-A Private MBS are $0.80 trillion and $0.64 trillion ($0.80 times 80.5% equals $0.64 trillion) respectively and the net number of loans is 2.14 million (2.67 million times 80.5% equals 2.14 million).

2. **Sources of information used to determine Alt-A exposure of Fannie and Freddie that is incremental to Alt-A Private MBS:**

   Fannie and Freddie acquired Alt-A in two mutually exclusive ways. They acquired Alt-A Private MBS and Alt-A whole loans (both Self-denominated Alt-A and Alt-A by Characteristic).

   Since the Alt-A Private MBS that they acquired is already included in the total for Alt-A Private MBS, it is not relevant for purposes of this Study.

   Fannie and Freddie both acquired the same seven types of high risk whole loans. Two of these risk types (FICO <620 and FICO of 620-659) have already been addressed by the Subprime by Characteristic analysis utilizing the LPS Prime Database, which includes all of Fannie and Freddie's loans. The other five high risk loan types are all Alt-A (either self-denominated Alt-A or Alt-A by Characteristic and are: negatively amortizing loans, interest-only loans, loans with an Original LTV >90%, loans with Combined LTV >90%, and Self-denominated Alt-A. In order to accurately address the issue of loans with multiple product features and avoid the double counting of overlapping loans, all five will be covered here.

   Fannie and Freddie's disclosures regarding these seven loan types have evolved over time, which has generally resulted in the disclosure of additional information. While Fannie and Freddie's disclosures are similar, Fannie provides some useful additional information, particularly with respect to loans with multiple product features. By Q.2:2009 not only were six of the seven product features listed on Fannie's "Credit Profile by Key Product Features", but Fannie provided key information helpful in addressing loans with more than one feature.[47] The product feature of Combined LTV >90% is the exception; however it was disclosed separately in Fannie's 2007 10-K[48] and Freddie's 2008 Quarter 2 10-Q.[49]

   In its 2009 Second Quarter Credit supplement, Fannie provided a subtotal which factors out any duplication for six of the features (all but Combined LTV >90%).[50] As of 6.30.09, the subtotal for these six key product features equaled $0.878 trillion with an average loan size of $152,814. The total before removing duplicates was $1.104 trillion.[51] The total without duplicates is 80% of the total with duplicates ($0.878 trillion divided by $1.104 trillion). This percentage may now be used to calculate Fannie's net loan amounts for the second quarter of 2008, our subject period. It is also helpful in eliminating Freddie's duplicates for

[47] Fannie Mae 2009 Second Quarter Credit Supplement, p. 5.
[48] Fannie Mae 2007 10-K, p. 128.
[49] Freddie Mac Quarter 2 10-Q, p. 60.
[50] While eight key product features are listed, two may be ignored. Both Fannie and Freddie have a category for loans with both a FICO <620 and an Original LTV > 90%, which loans are already included in the two named product features. Fannie has a category for self-denominated subprime loans, which is the smallest category ($7.9 billion) and is almost completely contained in either loans with FICO <620 or loans with FICO 620-559.
[51]Fannie Mae 2009 Q. 2 10-Q Investor Summary p. 5.

the same six features and point in time, as Fannie and Freddie's loans are similar and Freddie does not provide this added level of detail.

Determining Fannie's contribution to Alt-A:

As of 6.30.08, Fannie's six key product features totaled $1.214 trillion gross dollars and 7.944 million gross loans.[52] Multiplying by 80% to adjust for duplicates yields $0.971 trillion and 6.354 million net loans. The loan volume for two of the six key product features (FICO<619 and FICO of 620-659) total $0.394 trillion gross and net dollars and 2.882 million gross and net loans.[53] This results in the remaining 4 product features (negatively amortizing loans, interest-only loans, loans with an Original LTV >90%, and Self-denominated Alt-A) having a total of $0.820 trillion gross dollars ($1.214 trillion minus $0.394 trillion) and $0.577 trillion net dollars ($0.971 trillion minus $0.394 trillion) and 3.472 million net loans (6,354 million minus 2,882 million).

Fannie's seventh and final key category (Combined LTV >90%) may now be addressed. Fannie noted in its 2007 10-K: [54]

> "In recent years there has been an increased percentage of borrowers obtaining second lien financing to purchase a home as a means of avoiding paying primary mortgage insurance. Although only 10% of our conventional single-family mortgage credit book of business had an original average LTV ratio greater than 90% as of December.31, 2007, we estimate that 15% of our conventional single-family mortgage credit book of business had an original combined average LTV ratio greater than 90%. The combined LTV ratio takes into account the combined amount of both the primary and second lien financing on the property. Second lien financing on a property increases the level of credit risk [on the first lien] because it reduced [sic] the borrower's equity in the property and may make it more difficult to refinance. Our original combined average LTV ratio data is limited to second lien financing reported to us at the time of origination of the first mortgage loan."

As a result, an estimated $0.133 trillion of its portfolio at 6.30.08 consists of loans with a Combined LTV >90%.[55] The overlap between this product characteristic and the six that have already been addressed is estimated at 70%, yielding $0.040 trillion. Assuming these

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[52] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30 lists five features totaling $0.947 trillion, to which sum the sixth feature (FICO of 620-659 in the amount of $0.267 trillion) must be added, This brings the total to $1.214 trillion. While the fey feature, FICO of 620-659, was included in the 2009 Quarter 2 listing of key features, it was not listed in 2008.
[53]See Appendix 2
[54] Fannie Mae 2007 10-K, p. 128.
[55] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30. This is the result of multiplying the 5% difference noted times Fannie's $2.667 trillion total single-family portfolio at 6.30.08. This yields $0.133 trillion before addressing overlap.

loans have an average balance equal to Fannie's average loan amount of $152,814 for key product features yields a net 0.262 million loans.[56]

For the 5 product features comprising Fannie's Alt-A exposure, the gross and net dollars are $0.953 trillion ($0.820 trillion plus $0.133 trillion) and $0.617 trillion ($0.577 trillion plus $0.040 trillion) respectively and the net number of loans is 3.734 million (3,472 million plus 0.262 million). The process described in this section already accounts for any overlap.

Determining Freddie's contribution to Alt-A:

As of 6.30.08, Freddie's six key product features totaled $0.752 trillion.[57] Multiplying by 80% to adjust for duplicates yields $0.602 in unique loans comprised by the six key product features. However, the two key product features already accounted for in Table 4 (FICO<619 and FICO of 620-659) total $0.240 trillion.[58] This results in the remaining four products (negatively amortizing loans, interest-only loans, loans with an Original LTV >90%, and Self-denominated Alt-A) having a total of $0.512 trillion gross dollars and $0.362 trillion net dollars and 2.359 million net loans.

Freddie's seventh and final key category (Combined LTV >90%) may now be addressed. Freddie noted in its 2008 Quarter 2 10-Q: [59]

> "In prior years, as home prices increased, many borrowers used second liens at the time of purchase to reduce the LTV ratio on first lien mortgages. Including this secondary financing by third parties, we estimate that the percentage of first lien loans we have guaranteed that have a total original LTV ratio above 90% was approximately 14% at both June 30, 2008 and December 31, 2007.

Freddie's percentage of Original LTV >90% (without counting the impact of simultaneous 2nds) is 8%.[60] As a result, $0.110 trillion of its portfolio at 6.30.08 consists of loans with a Combined LTV >90%.[61] The overlap between this product characteristic and the six that have already been addressed is estimated at 70%, yielding $0.033 trillion. Assuming these loans have an average balance equal to Fannie's average loan amount of $152,814 for key product features yields a net 0.216 million loans.

For the 5 product features comprising Freddie's Alt-A exposure, the gross and net dollars are $0.622 trillion ($0.512 trillion plus $0.110 trillion) and $0.395 trillion ($0.362 trillion plus $0.033 trillion) respectively and the net number of loans is 2.575

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[56] Fannie Mae 2009 Second Quarter Credit Supplement, p. 5.

[57] Freddie Mac 2008 Second Quarter Financial Results p. 26 lists five features totaling $0.588 trillion, to which sum the sixth feature (FICO of 620-659 in the amount of $0.164 trillion) must be added, This brings the total to $0.752 trillion.

[58] FICO<620 ($0.076 trillion) and FICO of 620-659 ($0.164 trillion) are mutually exclusive, requiring no deduping. Alt-A has a weighted average FICO of 724 with a stated 4% overlap with FICO<620 and an estimated 9% overlap with FICO of 620-659 (resulting in a deduped amount of $0.190 trillion times 87% yielding $0.165 trillion). The sum of these 3 deduped product features totals $0.405trillion.

[59] Freddie Mac Quarter 2 10-Q, p. 60.

[60] Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 26.

[61] The 6% difference times Freddie's $1.837 trillion total single-family portfolio yields $0.110 trillion before deduping.

million (2.359 million plus 0.216 million). The process described in this section already accounts for any overlap.

3. **Determining the contribution by government loans to Alt-A:**

The MBA's NDS for Q2:08 reports that FHA and VA respectively had 3.492 million and 1.122 million loans outstanding.[62] The NDS does not report rural housing program loans; however loan volume at that time was small. Grossing up using the usual 82.5% coverage factor yields 5.59 million government loans (4.614 million divided by 0.825).

For the period in question, approximately 83% of FHA loans consisted of high Original LTV lending (Original LTV>90%) and approximately 70% had a FICO of <660.[63] While similar data is not available for the smaller volume VA and rural housing loan programs, the Original LTV and FICO distributions are believed to be similar. FHA and VA loans are included in the LP Prime Database already described. Therefore the approximately 70% of government loans with a FICO below 660 have already been accounted for in the category Subprime by Characteristic. This leaves 30% or a balance of 1.68 million loans that have not been accounted for. Assuming that 83% of these have an Original LTV >90% yields 1.39 million Alt-A loans with an Original LTV >90%). FHA loans have an average loans balance of $103,300.[64] VA is believed to average closer to $150,000 for a blended average of $115,000.

This results in $0.160 trillion in gross and net loan dollars (1.39 million loans times $115,000). The process described in this section already accounts for any overlap.

4. **Determining the contribution of Alt-A lending on conventional whole loans held by five large banks**

To determine this contribution both top down and bottom up approaches will be used.

Top down:

As noted earlier, the Fed reports that there were $9.42 trillion in first lien home mortgages outstanding at 6.30.08. Self denominated Subprime loans have been found to account for $1.19 trillion and Alt-A private MBS $0.800 trillion of this total. Fannie and Freddie's total financing activity (not just their activity accounted for in this Study) totaled an additional $4.504 trillion.[65] Government loans total approximately $0.643 trillion in outstanding loans.[66] These non-overlapping categories account for $7.137 trillion of the $9.42 trillion in

[62] National Delinquency Survey, Mortgage Bankers Association, Q208
[63] Data derived from 2009 Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund, pp. 42 and 44
[64] Derived from the FHA Biweekly report for July 16-31, 2008 found at: http://www.hud.gov/offices/hsg/comp/rpts/ooe/ol2009.pdf
[65] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30 and Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 26
[66] See earlier data noting 5.39 million outstanding government loans with an average balance of $115,000.

outstanding first mortgages. Most of the balance is accounted for by whole loan holdings of commercial banks, thrifts, and credit unions which total about $2.3 trillion as of 6.30.08.[67]

As of 9.30.09[68] $800 billion of the $2 trillion was held by just five banks (Citibank, Bank of America, JP Morgan Chase, Wells Fargo, and PNC). These bank's portfolios were increased as a result of their takeovers of distressed lenders such as Countrywide, Washington Mutual, Wachovia, and National City earlier in the financial crisis. The overall quality of $800 billion in 1-4 family first mortgages held today by Citibank, Bank of America, JP Morgan Chase, Wells Fargo, and PNC is poor. This is evidenced by the fact that the average of the 30+ delinquency rates[69] on the $0.800 trillion first mortgage loans held by these five banks is about 12%. The average delinquency rate on the approximately $0.600 trillion in first mortgages held by the 7186 smallest banks (out of 7211 banks reporting) as of the same date was a much lower 2.73%.[70]

This poor level of performance provides *prima facie* evidence that half or more of the $800 billion consists of loans with high risk characteristics such as option ARMs, Alt-A loans by Characteristic, Self-denominated Subprime and Self-denominated Alt-A loans.

Bottom up:

1. Wells purchased Wachovia which had $0.122 trillion of pay-option/potential negatively amortizing ARMs.[71] Total loans acquired by Wells upon the purchase of Wachovia totaled $0.160 trillion.[72]
2. Bank of America purchased Countrywide and was expected to take $33 billion in write offs.[73] When it acquired Countrywide it took on about $0.050 trillion in loans.[74]
3. JP Morgan Chase added about $0.100 trillion in loans when it purchased Washington Mutual.[75]
4. Indy Mac had about $0.011 trillion in loans when it failed. It specialized in Alt-A loans.[76]

[67] Fed Flow of Funds Q.2:2008, L. 218. Note: a small portion of this $2 trillion in mortgages were presumably made to what the Fed calls "nonfarm noncorporate businesses". These loans were not included in the $9.42 trillion total for household sector home mortgages

[68] This is the earliest date for which this detailed information was available to me. Since non-traditional lending by private lenders had ended by 6.30.08.any non-traditional loans in portfolios as of 9.30.09 would have been originated prior to 6.30.08 and also held in portfolio prior to that date..

[69] A 30-day plus delinquency is a loan where the scheduled payment is 30-days or more overdue. Such a loan might be 30-, 60-, 90-days or more overdue.

[70] Bank delinquency data from a report in author's files.

[71] http://www.reuters.com/article/idUSTRE50P6O420090126

[72] http://www.wlmlab.com/bkMet.asp?inst=HC1120754&loan=lnrersfm&met=delq Wells' 1-4 unit 1st mortgage loan holdings increased by $0.160 trillion in Q.4:08 after this acquisition. Before this acquisition the delinquency rate on Wells' existing $0.060 trillion of 1-4 unit 1st mortgage loans was abnormally high in Q.3:08,

[73] http://www.bloomberg.com/apps/news?pid=20601110&sid=arYakEWFRtTE

[74] http://www.wlmlab.com/bkMet.asp?inst=HC1073757&loan=lnrersfm&met=delq Bank of America's 1-4 unit 1st mortgage loan holdings increased by $0.050 billion in Q.3:08 after this acquisition.

[75] http://www.wlmlab.com/bkMet.asp?inst=HC1039502&loan=lnrersfm&met=delq Chase's 1-4 unit 1st mortgage loan holdings increased by $0.100 billion in Q.3:08 after this acquisition.

[76] http://en.wikipedia.org/wiki/OneWest_Bank

5. PNC was expected to take a $20 billion write down on the loans it acquired as part of its acquisition of National City.[77] PNC added about $0.015 trillion in loans when it purchased National City.[78]

Just the examples noted above total $0.350 trillion in 1-4 first mortgage loans, mostly loans acquired from troubled lenders. These loans are generally not subprime, have not been securitized, and were not acquired by Fannie or Freddie. Thus there is little overlap with previously developed loan totals. As noted from the examples above, they generally have the characteristics of Alt-A. Many are CRA loans held in portfolio with high (>90%) or ultra-high (>95% Original or Combined LTVs).[79] Others are pay option ARMs and other types of Alt-A loans as noted in the above examples.

Combining the top down analysis with the bottom up supports an estimate of $0.500 trillion in Alt-A and Subprime loans contained in the $0.800 trillion in loans held by the five referenced large banks. Perhaps 20% have FICOs below 660.

This results in $0.500 trillion gross and $0.400 trillion net dollars of Alt-A loans. Assuming an average loan amount of $300,000[80] results in 1.33 million Alt-A loans. The process described in this section already accounts for any overlap.

5. **Determining the contribution of Alt-A lending on other conventional whole loans**

The analysis regarding the five large banks noted in 4 above results in an unaccounted for balance of about $1.00 trillion in 1-4 unit first mortgage loans (perhaps 6-7 million loans) held by the remaining 7000+ banks along with all thrifts and credit unions. Other than to indicate that this total must include some number of Subprime and Alt-A loans, that many are likely CRA loans, and that the percentage that consists of Alt-A lending is relatively small (likely 10% or less given the low overall delinquency rate noted above) little more can be ascertained. Third Federal Savings (Ohio) is a case in point – it had about $292 million in Home Today CRA loans (out of a loan portfolio of about $10 billion). While the delinquency rate on the Home Today loans was 37.9%, Third Federal's delinquency rate on the balance of its portfolio was 2.2%.[81] For purposes of this Study, this remainder will be identified as an unidentifiable quantity of Alt-A by Characteristic.

Section E: Additions to total outstanding subprime and Alt-A loans derived from the SEC's disclosures and data releases by Fannie and Freddie subsequent to 2009.

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[77] http://www.reuters.com/article/idUSN2451279820081024

[78] http://www.wlmlab.com/bkMet.asp?inst=HC1069778&loan=lnrersfm&met=delq PNC's 1-4 unit 1st mortgage loan holdings increased by $0.015 billion in Q.3:08 after this acquisition.

[79] Comprehensive data on CRA lending is not generally disclosed. Two illustrative examples are: Self-Help's Community Advantage Program (CAP) where 82% of the loans had an LTV >=97% and 36% had FICO's below 660 and Third Federal Savings' "Home Today" CRA program which has a 37.9% delinquency rate. CAP data is found on p. 27 of "Risky Borrowers or Risky lenders" at http://www.ccc.unc.edu/documents/RiskyMortg_Final_Dec11.pdf and Home Today data is found on p. 17 of Third Federal's 9.30.09 10- Q at http://www.snl.com/Cache/8679379.pdf?O=3&IID=4041914&OSID=9&FID=8679379.

[80] This is likely a high average loan amount. While a sizable number are pay option ARMs and Self-denominated Alt-A loans, many were smaller CRA loans.

[81] Data is found on p. 17 of Third Federal's 9.30.09 10- Q at http://www.snl.com/Cache/8679379.pdf?O=3&IID=4041914&OSID=9&FID=8679379.

Appendix 3 contains a table and related footnotes that summarize the additional subprime and Alt-A loans discovered and disclosed by the SEC in connection with its suit against three of the top officials of both Fannie and Freddie and the additional subprime and Alt-A loans that were contained in data releases by the GSEs after 2009. Some of these loans duplicate mortgages that were already known and included in the analysis above, but the numbers in the table are net of those duplications.

The table in Appendix 3 of Study 2 shows that the SEC discovered and disclosed GSE subprime loans with an unpaid principal value of $325.7 billion (prior to deduping: $339.7)[82], which translate into 2.4 million loans with an average size of $137,570 per loan[83], and 0.9 million GSE Alt-A loans with an unpaid principal amount of $138.4 billion (prior to deduping: $692.2 billion) and an average size of $152,814.[84] These additional loans have been included in the total in Table 1.

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[82] There are 12 columns of subprime and Alt-A loans listed in Appendix 3. To take into account that a loan that might belong to more than one column, the totals are deduped as the columns move from left to right.
[83] Average loan amount for GSE loans with a FICO score of less than 660.
[84] Average loan amount for GSE loans with six key product features (Alt-A) as noted earlier.

Appendix 1 to Study 1

Office of Comptroller of the Currency, Federal Reserve, Federal Deposit Insurance Corporation, and Office of Thrift Supervision's "Expanded Guidance for Subprime Lending Programs"

Published in 2001 and found at http://www.federalreserve.gov/Boarddocs/SRletters/2001/sr0104a1.pdf

> "The term "**subprime**" refers to the credit characteristics of individual borrowers. Subprime borrowers typically have weakened credit histories that include payment delinquencies and possibly more severe problems such as charge-offs, judgments, and bankruptcies. They may also display reduced repayment capacity as measured by credit scores, debt-to-income ratios, or other criteria that may encompass borrowers with incomplete credit histories. Subprime loans are loans to borrowers displaying one or more of these characteristics at the time of origination or purchase. Such loans have a higher risk of default than loans to prime borrowers. Generally, subprime borrowers will display a range of credit risk characteristics that may include one or more of the following:

- Two or more 30-day delinquencies in the last 12 months, or one or more 60-day delinquencies in the last 24 months;
- Judgment, foreclosure, repossession, or charge-off in the prior 24 months;
- Bankruptcy in the last 5 years;
- Relatively high default probability as evidenced by, for example, a credit bureau risk score (FICO) of 660 or below (depending on the product/collateral), or other bureau or proprietary scores with an equivalent default probability likelihood; and/or
- Debt service-to-income ratio of 50% or greater, or otherwise limited ability to cover family living expenses after deducting total monthly debt-service requirements from monthly income."

> This list is illustrative rather than exhaustive and is not meant to define specific parameters for all subprime borrowers. Additionally, this definition may not match all market or institution specific subprime definitions, but should be viewed as a starting point from which the Agencies will expand examination efforts."

Appendix 2 to Study 1

FICO<620 and FICO 620-659 held by Fannie and Freddie as of 6.30.08:[85]

Type	Number of loans	$ amount
Fannie		
<620 FICO[86]	1 million	$0.127 trillion
620-659 FICO[87]	1.882 million	$0.267 trillion
Subtotal	*2.882 million*	*$0.394 trillion*
Freddie		
<620 FICO[88]	0.574 million	$0.076 trillion
620-659 FICO[89]	1.148 million	$0.164 trillion
Subtotal	*1.722 million*	*$0.240 trillion*
Total	4.544 million	$0.634 trillion

[85] These totals were developed using the initial methodology for Study 1.

[86] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30. Number of loans derived from dividing total unpaid principal balance by average unpaid principal loan balance per loan ($127,346).

[87] Fannie Mae 2008 Q. 2 10-Q p. 74 indicates that 10% of the single-family book of business had a FICO of 620-659. Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30 indicates that the single-family book of business totaled $2.6665 trillion, resulting in $0.267 trillion of loans with a FICO of 620-659. Fannie Mae 2008 Credit Supplement p. 5 indicates an average loan size of $141,748 for loans with a FICO of 620-659 resulting in 1.882 million loans.

[88] Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 26. Number of loans derived from total unpaid principal balance and average unpaid principal loan balance per loan ($132,369).

[89] Freddie Mac disclosed the dollar amount of its exposure to loans with a FICO of 620-659 in its Fourth Quarter 2008 Financial Results Supplement p. 15. Number of loans derived from total unpaid principal balance and average unpaid principal loan balance per loan ($143,177).

Study 2 with corrections and edits through January 6, 2015

Sizing Total Federal Government and Federal Agency Contributions to Subprime and Alt-A Loans in U.S. First Mortgage Market as of June 30, 2008

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This Study outlines in detail how I calculated the Federal government and Federal agency contributions to subprime and Alt-A loans outstanding in the U.S. financial system on June 30, 2008 (unless otherwise noted).

Background:

In the first half of the 1990s, the federal government adopted three policy initiatives that were intended to supplement the operations of the Federal Housing Administration (FHA), which had until that time been the federal government's main vehicle for higher risk home lending:

1. In 1992, Congress imposed affordable housing goals on Fannie and Freddie[90] and they became both competitors of FHA and a source of demand for CRA loans;
2. in 1994, HUD began to enter into "Fair Lending Best Practices Agreements" with lenders across the nation;[91] and
3. in 1995, the Community Reinvestment Act (CRA), which had been passed in 1977 but had had little impact on bank lending until then, was given new life with more stringent regulations applicable to all insured banks

These additional initiatives covered most lenders and most of the secondary market. Each either explicitly (FHA, CRA, and HUD) or implicitly (Fannie and Freddie) required the use of flexible lending standards, a policy that was in place for over a dozen years. At the end of this period, the U.S. suffered a catastrophic and nationwide decline in home prices, which can largely be attributed to the poor quality of the mortgages that the foregoing initiatives produced. This Study shows how many high risk loans resulted from these initiatives.

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[90] Federal Housing Enterprises Financial Safety and Soundness Act of 1992

[91] See Appendix 1

Section A: Definitions – these definitions are the same as used in Study 1: "Sizing Total Exposure to Subprime and Alt-A Loans in U.S. First Mortgage Market as of June 30, 2008, as updated on January 6, 2015."

Up until 2013, the U.S. did not have a standardized system for reporting on mortgage quality.[92] One of the reasons for confusion about the number of subprime and Alt-A mortgages outstanding at any time in the U.S. is that many of the participants and reporting agencies used different definitions of the same terms. In many cases these definitions did not classify subprime and Alt-A loans based on objective risk characteristics but on the basis of how the lender or securities issuer classified a loan. For example, before its insolvency in 2008 and its takeover by the FHFA as its conservator, Fannie Mae classified a loan as subprime if the mortgage loan was originated by a lender specializing in the subprime business or by subprime divisions of large lenders.[93] This had the effect of reducing its subprime loan count so that it rounded to zero.

In addition, when the Federal Reserve studied the performance of CRA loans, they defined them as subprime if they were reported as high interest loans under the Home Owners Protection Act (HOPA); this excluded a very large number of CRA loans that did not carry interest rates that fell into the HOPA category. The result was again that a very small number of CRA mortgages were defined as subprime. At the same time, the risk characteristics and performance of CRA loans went largely unreported. In addition as noted in the Preface, increases in leverage of all kinds were endemic across all defined product types. In this Study, I use the objective risk characteristics of a loan to determine whether it should be considered subprime or Alt-A.

In this Study, I use the objective risk characteristics of the loan to determine whether it should have been considered subprime or Alt-A (subprime and Alt-A are sometimes referred to in the Three Studies as non-traditional mortgages (NTMs). Correspondingly, a mortgage that conforms to traditional underwriting standards is called a prime loan. The benchmark for a prime loan is a Fannie Mae 1990 random sample review (the Fannie Random Sample Review) of the characteristics of the loans in Fannie Mae's mortgage portfolio.[94] These characteristics determined what was considered a prime mortgage at the time (referred to in these Studies as the Base Period). It consisted generally of a good credit record (now reflected in a FICO score greater than 660), a 10 percent or greater downpayment (an LTV no greater than 90 percent), an LTV and/or combined LTV on rate and term refinances that did not exceed 80%, an LTV and/or combined LTV on cash

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[92] In December 2013, the American Enterprise Institute's International Center on Housing Risk (of which I am the codirector) began publishing the National Mortgage Risk Index (NMRI), which places loans in objective risk buckets using a transparent methodology. Each loan's default risk is assessed based on performance of 2007 vintage loans with similar characteristics. Currently the NMRI covers nearly government guaranteed mortgages for home purchases (about 85% of all purchase loans). There are plans to expand coverage to include non-agency loans, refinances, and second mortgages in 2015.

[93] In November 2008, Fannie acknowledged that it had "other loans with some features that are similar to Alt-A and subprime loans that [it had] not classified as Alt-A or subprime because they do not meet [its] classification criteria. See P. 182 of Fannie's Q.3:2008 10-Q

[94] In March 1992, Fannie Mae completed a study of approximately 26,000 randomly selected loans in its portfolio (the Fannie Random Sample Review). The objective was to determine the borrower characteristics that were correlated with the presence or absence of serious delinquencies. The study showed that 94 percent of the loans had LTV ratios of 90 percent or below (i.e., at least 10 percent downpayments), while only six percent had LTV ratios of greater than 90 percent. Total debt-to-income (DTI) ratios were also low; 85 percent of borrowers had a total DTI no higher than 38 percent. Credit records were excellent; although FICO scores were not in use at this point, over 98 percent of the borrowers had no mortgage late payments in any year and 99.5 percent had at most one late mortgage payment. Fannie Mae, "Serious Delinquencies by Demographic Characteristic," March 1992, Document in author's files.

out refinances that did not exceed 75%, and a DTI ratio that did not exceed 38 percent. In general, mortgages that did not meet these standards or had other deficiencies outlined below would be considered NTMs and would not be acquired by the GSEs. Indeed, the definition of a subprime loan was often given as a loan the GSEs would not buy.

Definitions of the various types of NTMs follow:

Subprime Loans:[95] In general, these are loans to borrowers with "weakened credit histories that include payment delinquencies and possibly more severe problems such as charge-offs, judgments, and bankruptcies."[96] There are two varieties of subprime loans:

Self-denominated Subprime (SD Subprime): These are loans denominated or classified as subprime by the originator or the securities issuer and had one or more of the following characteristics:

4. Originated by a lender specializing in subprime business or by subprime divisions of large lenders;
5. Placed in a subprime private MBS (Subprime Private MBS); or
6. Had a rate of interest considered "high" under HOPA.

Not Initially Classified as Subprime or Subprime by Characteristic: These are loans with a FICO score of less than 660.[97] While FICO scores did not come into general use in mortgage lending until the mid-1990s, industry segmentation by credit attributes and market shares indicate that these loans would have been almost exclusively done by FHA and private subprime as these two channels, with 23 percent market share in 1990, served borrowers with impaired credit.[98] At the same time Fannie and Freddie, based on borrower credit characteristics set forth in Fannie's Random Sample Review for 1998-1991 acquisitions, served prime borrowers and would have accounted for few of these loans. The formal use of a 660 FICO score as the demarcation line between prime and subprime loans goes back to 1995. As noted in January 1997 by Standard & Poor's, "…a FICO score of 660 [is] the investment-grade score as defined in Freddie Mac's industry letter of August 1995."[99] In 2001 federal bank regulators issued "Expanded Guidance for Subprime Lending Programs" which set forth a number of credit characteristics for subprime borrowers including:

> "Relatively high default probability as evidenced by, for example, a credit bureau risk score (FICO) of 660 or below (depending on the product/collateral).[100]

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[95] In 1990 one of the characteristics of a GSE or prime loan was a DTI the generally did not exceed 38% (offsetting or compensating factors might allow this to be increased to 39-41%. Thus none exceeded 41%. As a result, one of the characteristics of the best grade of subprime loan was a DTI just above the leval acceptable to the GSEs, generally defined as,a DTI <45% (worse risk grades consisted of DTIs <50%, <55%, etc.). However, by 1997 13 percent of the GSEs DTIs were greater than or equal to 42%--loans that would have been characterized a subprime in 1990. By 2007 43 percent of the GSEs DTIs were greater than or equal to 42%--- again these would have been characterized a subprime in 1990. Thus from the mid-1990s on the GSEs were squarely in competition with traditional private subprime lending. For purposes of the Three Studies, GSE loans with DTIs in excess of traditional levels in 1990 are characterized as Alt-A loans. The term subprime is reserved for loans denominated as such or loans with impaired credit (as evidenced by a FICO score below 660).

[96] See Appendix 2

[97] See footnote 10 in Study 1

[98] Inside Mortgage Finance

[99] S&P Structured Finance Ratings, January 1997, p. 14

[100] See Appendix 2.

In 2009, both GSEs implicitly acknowledged the 660 FICO demarcation point when they indicated in the credit supplements to their quarterly and annual reports that certain key risk characteristics had a high likelihood of default.[101] Fannie, for example, lists risk characteristics and related serious delinquency (SD) rates for FICOs of <620 (16.08% SD) and FICOs of 620-659 (11.32% SD). Other high volume high risk categories listed include interest only loans (17.94% SD), Original LTV >90% (11.56% SD), and Alt-A (13.97% SD).[102] Fannie's SD rate on its traditionally underwritten loans (those loans without any of these high risk characteristics) is 1.78%.[103] According to Fannie's 2009 Credit Supplement, loans with a FICO of <620 and 620-659 have a default probability 9 times and 6.4 times, respectively, the default probability of traditionally underwritten loans.

In 2011 the Securities and Exchange Commission entered into Non-Prosecution Agreements with Fannie Mae and Freddie Mac (NPAs). These agreements for the first time disclosed additional subprime acquisitions by the GSEs.

Alt-A Loans: These loans either had low or no documentation requirements or had some feature that was "alternative to agency" (hence, "Alt-A")—i.e., did not meet the traditional underwriting guidelines of the GSEs in such characteristics as Original LTV, Combined LTV, debt ratio, rules for loans on investment properties, rules on cash-out refinances, condominium guidelines, special income definitions, low start rates, or negative amortization ARMs. Tracking this category was made more difficult because the GSEs increased their "acceptable" DTI ratios starting sometime after 1991 (this date is known from the earlier referred to Fannie Random Sample Review) and before 1997 (this is first date for which broad GSE DTI data are available and these data already show a substantial increase in DTIs as of 1997). This increase in GSE DTIs blurred one of the traditional the demarcation lines among traditional prime, private subprime, FHA, and Alt-A.[104] According to the Fannie Random Sample Review in 1990 virtually none of Fannie's loans had a total DTI ratio equal to or greater than 42 percent. By 1997 this had risen to 13 percent for the GSEs, putting the GSEs squarely in competition with traditional private subprime lending (derived from data relating to fully documented GSE loans released by the Consumer Financial Protection Bureau).[105] A similar degradation of standards occurred with respect to the acceptable LTV and combined CLTV limits for purchase, cash out and no cash out refinances and combination loans (loans with a combination first and second mortgage, many times acquired by different investors).

To address this gradual but uninterrupted trend toward increased leverage, I define Alt-A loans in relation to their deviation from traditional underwriting in the late 1980s and the early-1990s (the Base Period), as exemplified in the Fannie Random Sample Review. It is the wholesale abandonment of traditional underwriting standards that fueled the housing boom, the subsequent bust, and led to the financial crisis and the ensuing Great Recession.

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[101] Fannie Mae 2009 Third Quarter Credit Supplement, p. 5, found at: http://www.fanniemae.com/ir/pdf/sec/2009/q3credit_summary.pdf and Freddie Mac Third Quarter Results Supplement p. 18 found at http://www.freddiemac.com/investors/er/pdf/supplement_3q09.pdf

[102] Fannie Mae 2009 Third Quarter Credit Supplement, p. 5

[103] Id. Derived from data found on p.5

[104] See footnote 10.

[105] DTI distributions derived using interpolation and extrapolation of data contained in the Consumer Financial Protection Bureau's request for further comment on Ability-to-Repay mortgage rule dated May 31, 2012. Dataset consists of fully documented income loans that are fully amortizing with a loan term <=30 years. For this data set, the maximum DTI grouping is "=>46%" which constituted 31% of sampled loans. http://files.consumerfinance.gov/f/201205_cfpb_Ability_to_Repay.pdf

There are two varieties of **Alt-A Loans**:

Self-denominated Alt-A or SD Alt-A: Loans initially classified as Alt-A generally had one or more of the following characteristics:

1. A loan initially classified it as Alt-A based on documentation or other features, or
2. A loan placed in a private MBS denominated as an Alt-A Private MBS.

Not Initially Classified as Alt-A or Alt-A by Characteristic: Loans not initially classified as Alt-A which had:

1. Non-traditional ARM terms such as low start ("teaser") rates or no amortization (interest only) or negative amortization. These could be in either private MBS or whole loan form;
2. Home purchase loans:
   a. High Original LTV including 97% Original LTV and 100% Original LTV loans, along with 95% Original LTV loans with non-traditional underwriting standards and debt ratios in excess of 38percent. For the period in question, virtually all Original LTV >90% lending had one or more of these characteristics. This lending may also be referred to as Original LTV >90%. During the Base Period, while 9% of Fannie loans had an LTV of 95%, few , if any, would have had a Total Debt-to-Income (DTI) ratio greater than 38 percent and none had an LTV greater than 95%; or
   b. High Combined LTV where a combined 1st and 2nd lien was used to reduce the down payment required. This lending commonly involved an 80% 1st and a 20% second. This lending may also be referred to as Combined LTV >90%. During the Base Period, only 4 percent of Fannie loans had a combined 1st and 2nd lien and few, if any had a CLTV >90%.
3. Rate and term refinance loans where the interest was reduced and the term reduced; 7% of Fannie's acquisitions had an original LTV or CLTV greater than 80 percent during the Base Period.[106]
4. Cash taken out (cash-out) when loans were refinanced; where, during the Base Period, 1% of the GSEs' acquisitions had an original LTV or CLTV greater than 80 percent.[107]
5. Total Debt-to-Income (DTI) ratios greater than or equal to 42 percent.

In 2011 the Securities and Exchange Commission entered into Non-Prosecution Agreements with Fannie Mae and Freddie Mac (NPAs). These agreements for the first time disclosed additional Alt-A acquisitions by the GSEs.

In 2012 Fannie Mae and Freddie Mac disclosed detailed loan performance data on a subset of its loan acquisitions covering 1999 (partial for Fannie) through 2011. These data allowed for the calculation of additional Alt-A loans acquired by the GSEs for the first time.

FHA, VA, and Rural Housing Loans: For the 2002-2007 loan books, approximately 83% of FHA loans consisted of High Original LTV lending (Original LTV>90%) and approximately 70% had a FICO of <660[108]. FHA is projecting a 21% and 24% claims rate[109] for its 2006 and 2007 book

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[106] This was the percentage found for Fannie's acquisitions during the Base Period of 1988-1991.
[107] This was the percentage found for Fannie's acquisitions during the Base Period of 1988-1991.
[108] Data in or derived from 2009 Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund, pp. 42 and 44

years respectively. While similar data is not available for the smaller volume VA and rural housing loan programs, Original LTV distributions are believed to be similar.

Original loan-to-value or Original LTV: The loan-to-value relationship at the time of loan origination of the first mortgage and the value of the home being financed.

Combined loan-to-value or Combined LTV: The loan-to-value relationship at the time of loan origination of the combined amounts of first mortgage and second mortgage and the value of the home being financed.

Section B: Summary of Federal government and Federal agency contributions to total subprime and Alt-A loan exposure

In addition to no standardized system of definitions of mortgage quality, the U.S., up until 2013, had no single place where data on the numbers of mortgages as well as their quality are kept. Accordingly, in order to develop a comprehensive number of NTMs such as subprime and Alt-A mortgages I had to compile and conform data from several different sources. Based on the disclosures in these sources and the definitions above, I estimate the Federal government and Federal agency contributions to subprime and Alt-A loan exposures as follows:

Table 1: Federal government and Federal agency contributions to subprime and Alt-A loan exposures as of 6.30.08:[110]

Table or Section with detail*	**Subprime and Alt-A Loans**	**$ in billions**	**Number of loans in millions**
Table 2	Fannie	1,421	9.277
Table 3	Freddie	1,112	7.238
Section E	FHA/VA/Rural Housing	537	4.760
Section F	FHLB	50	0.313
Section G	CRA and HUD Program Loans	312	2.240
	Total Federal contribution to Subprime and Alt-A	**3,482 (rounded)**	**24 (rounded)**[111]
	Total Subprime and Alt-A	$5,300 (rounded)	31 (rounded)

[109] Id. Found at Appendix F-3. FHA insures loans against loss from default. When there is an insured loss, FHA pays a claim. Losses generally result from a foreclosure. FHA keeps track of the claims it pays or expects to pay by projecting a claims rate for each book year of insured loans. A projected claims rate of 24% means that FHA expects to pay 24 claims for every 100 loans insured.

[110] Unless otherwise noted, all dollar and loan count totals have been "deduped", that is loans that might belong to more than one government channel are only counted once. For example, Fannie Mae acquired CRA loans. These loans are included in the Fannie Mae total and excluded from the CRA and HUD Program Loans totals.

[111] This total is larger than the amount initially estimated in 2009. First, Fannie released details regarding overlaps among its high risk loans for the first time in August 2009. My prior estimates for both Fannie and Freddie had conservatively assumed a lower total balance based on more overlapping loans and a larger average loan balance than was the case. Second, my analysis of CRA and HUD Program Loans is more detailed than my previous analysis and resulted in a larger estimate.

*Within each section, the text setting out the various concluded dollar amounts and number of loans for each source is bolded.

In the balance of this Study, I will show how these totals were developed.

Section C. Detail of Fannie contributions to total subprime and Alt-A loan exposure

Note: When the Three Studies were initially published, I used the methodology described below to compute the total number of NTMs to which Fannie and Freddie were exposed on June 30, 2008, and estimated the number to be 12 million loans, or 62% of the 19.3 million mortgages on the books of government agencies. However, subsequent disclosures by the GSEs—in Non-Prosecution Agreements with the SEC[112] and the GSEs' release of detailed loan origination characteristics in a subset of their June, 2008 stock of loans—required that the loan totals be increased to the current numbers in the tables for Fannie and Freddie below. Below, I show the methodology for the initial estimate of 12 million loans, followed by the additional amounts that the subsequent disclosures required. The sources of information on the GSEs' exposure to subprime and Alt-A loans are covered in Section D.2 of Study 1, and information on the GSEs' exposure to subprime loans appears in Appendix 2.

Table 2: Fannie contributions to total subprime and Alt-A loan exposure (updated to January 6, 2015):[113]

Type	**$ in billions**	**Number of loans in millions**
Subprime Private MBS	36	0.235
Alt-A Private MBS	30	0.175
Subprime by Characteristic loans, Self-denominated Alt-A and Alt-A by Characteristic loans held in mortgage credit book	1,355	8.867
Total	1,421	9.277

1. **Fannie's holdings of Subprime Private MBS as of 6.30.08:**

   Fannie held $36 billion in Self-Denominated Subprime Private MBS at 6.30.08[114] with an average principal balance per loan of $153,400[115] for a total of 0.235 million loans.

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[112] In December 2011, the SEC charged three former top officials of both Fannie and Freddie with failure to disclose the GSEs' acquisition of large numbers of loans that should have been characterized as subprime or Alt-A. In connection with the SEC suit, both GSEs conceded in non-prosecution agreements the accuracy of the SEC's allegations and the SEC's accounting of the number of the undisclosed loans. See Non-Prosecution Agreement between Fannie Mae and the Securities & Exchange Commission, dated December 13, 2011. See also Non-Prosecution Agreement between Freddie Mac and the Securities & Exchange Commission, dated December 13, 2011

[113] Unless otherwise noted, all dollar and loan count totals have been "deduped", that is loans that might belong to more than product are only counted once. For example, Fannie Mae acquired both Subprime by Characteristic and Alt-A loans. Any Alt-A loans with a FICO score of <660 are included only in the Subprime by Characteristic category and are excluded from the Alt-A category.

[114] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 20

[115] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30. As no average principal balance per loans is provided, Fannie's average loan size for its portfolio of subprime loans was used.

2. **Fannie's holdings of Alt-A Private MBS as of 6.30.08:**

   Fannie held $30 billion in Self-Denominated Alt-A Private MBS at 6.30.08 [116] with an average principal balance per loan of $171,269[117] for a total of 0.175 million loans.

3. **Fannie's single-family mortgage credit book of business holdings of Subprime by Characteristic loans, Self-denominated Alt-A and Alt-A by Characteristic loans as of 6.30.08**

   Fannie acquired seven types of high risk whole loans: FICO <620, FICO of 620-659, negatively amortizing loans, interest-only loans, loans with an Original LTV >90%, loans with Combined LTV >90%, and Self-denominated Alt-A.

   Fannie and Freddie's disclosures regarding these seven loan types have evolved over time, which has generally resulted in additional information being provided. While Fannie and Freddie's disclosures are similar, Fannie provides some useful additional information, particularly with respect to loans with multiple product features. By Q.2:2009 not only were six of the seven product features listed on Fannie's "Credit Profile by Key Product Features", but key information helpful in addressing loans with more than one feature was provided.[118] The product feature of Combined LTV >90% is the exception; however it was disclosed separately in Fannie's 2007 10-K[119] and Freddie's 2008 Quarter 2 10-Q.[120]

   In its 2009 Second Quarter Credit supplement, Fannie provided both individual dollar amounts for each of the six features (all but Combined LTV >90%) and a subtotal which factors out any duplication among the six. An average loan size of $152,814 for the loans in the non-duplicative subtotal is also provided.[121] As of 6.30.09, the subtotal for these six key product features equaled $878 billion with an average loan size of $152,814. The total before removing duplicates was $1.104 trillion.[122] The total without duplicates is 80% of the total with duplicates ($878 billion divided by $1.104 trillion). This percentage would have changed little over one year's time and may therefore be used to calculate Fannie's net loan amounts for the second quarter of 2008, our subject period. It is also helpful in eliminating Freddie's duplicates for the same six features for the second quarter of 2008, as Fannie and Freddie's loans are similar. Freddie does not provide this added level of detail.

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[116] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 20,

[117] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30. As no average principal balance per loans is provided, Fannie's average loan size for its portfolio of Alt-A loans was used.

[118] Fannie Mae 2009 Second Quarter Credit Supplement, p. 5.

[119] Fannie Mae 2007 10-K, p. 128.

[120] Freddie Mac Quarter 2 10-Q, p. 60.

[121] While eight key product features are listed, two may be ignored. Both Fannie and Freddie have a category for loans with both a FICO <620 and an Original LTV > 90%, which loans are already included in the two named product features. Fannie has a category for self-denominated subprime loans, which is the smallest category ($7.9 billion) and is almost completely contained in either loans with FICO <620 or loans with FICO 620-559.

[122] Fannie Mae 2009 Q. 2 10-Q Investor Summary p. 5.

As of 6.30.08, Fannie's six key product features totaled $1.214 trillion gross dollars and 7.944 million gross loans.[123] Multiplying by 80% to adjust for duplicates yields $971 billion and 6.354 million net loans ($971 billion divided by $152,814).

Fannie's seventh and final key category (Combined LTV >90%) may now be addressed. Fannie noted in its 2007 10-K: [124]

> "In recent years there has been an increased percentage of borrowers obtaining second lien financing to purchase a home as a means of avoiding paying primary mortgage insurance. Although only 10% of our conventional single-family mortgage credit book of business had an original average LTV ratio greater than 90% as of December.31, 2007, we estimate that 15% of our conventional single-family mortgage credit book of business had an original combined average LTV ratio greater than 90%. The combined LTV ratio takes into account the combined amount of both the primary and second lien financing on the property. Second lien financing on a property increases the level of credit risk [on the first lien] because it reduced [sic] the borrower's equity in the property and may make it more difficult to refinance. Our original combined average LTV ratio data is limited to second lien financing reported to us at the time of origination of the first mortgage loan."

As a result, an estimated $133 billion of its portfolio at 6.30.08 consists of loans with a Combined LTV >90%.[125] The overlap between this product characteristic and the six that have already been addressed needs to be estimated. Fannie does not provide overlap information for this characteristic. I have conservatively estimated the overlap at 70%, yielding $40 billion. Assuming these loans have an average balance equal to Fannie's average loan amount of $152,814 for key product features yields a net 0.262 million loans.[126]

For the 7 product features that comprise Fannie's mortgage credit book of business of Subprime by Characteristic, Self-denominated Alt-A and Alt-A by Characteristic loans, the net dollars are $1.011 trillion ($971 billion plus $40 billion) respectively and the net number of loans is 6.616 million (6.354 million plus 0.262 million).

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[123] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30 lists five features totaling $947 billion, to which sum a sixth feature (FICO of 620-659 in the amount of $267 billion) must be added, This brings the total to $1.214 trillion. While the fey feature, FICO of 620-659, was included in the 2009 Quarter 2 listing of key features, it was not listed in 2008. See Appendix 2 for detail regarding the calculation of Fannie's loans with a FICO of 620-659.
[124] Fannie Mae 2007 10-K, p. 128.
[125] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30. This is the result of multiplying the 5% difference noted times Fannie's $2.667 trillion total single-family portfolio at 6.30.08. This yields $133 billion before addressing overlap.
[126] Fannie Mae 2009 Second Quarter Credit Supplement, p. 5.

Section D: Detail of Freddie's contributions to total subprime and Alt-A loan exposure

Table 3: Freddie's contributions to total subprime and Alt-A loan exposure (updated to January 6, 2015):

Type	$ in billions	Number of loans in millions
Subprime Private MBS	$85	0.555
Alt-A Private MBS	$43	0.244
Subprime by Characteristic loans, Self-denominated Alt-A and Alt-A by Characteristic loans held in mortgage credit book	$984	6.439
Total	$1.112	7.238

1. **Freddie's holdings of Subprime Private MBS as of 6.30.08:**

   Freddie held $85 billion in Self-Denominated Subprime Private MBS at 6.30.08[127] with an average principal balance per loan of $153,400[128] for a total of 0.535 million loans.

2. **Freddie's holdings of Alt-A Private MBS as of 6.30.08:**

   Freddie held $43 billion in Self-Denominated Alt-A Private MBS at 6.30.08 [129] with an average principal balance per loan of $175,961[130] for a total of 0.233 million loans.

3. **Freddie's single-family credit guarantee portfolio of business holdings of Subprime by Characteristic loans, Self-denominated Alt-A and Alt-A by Characteristic loans as of 6.30.08**

   Freddie acquired seven types of high risk whole loans: FICO <620, FICO of 620-659, negatively amortizing loans, interest-only loans, loans with an Original LTV >90%, loans with Combined LTV >90%, and Self-denominated Alt-A.

   As noted earlier, Fannie provides details regarding overlaps among high risk loans that can also be applied to Freddie's credit guarantee portfolio
   .
   As of 6.30.08, Freddie's six key product features totaled $752 billion.[131] Multiplying by 80% to adjust for duplicates yields $602 billion and 3.939 million net loans ($602 billion divided by $152,814)

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[127] Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 36
[128] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30. As no average principal balance per loans is provided, Fannie's average loan size for its portfolio of subprime loans was used.
[129] Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 36
[130] Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 26. As no average principal balance per loans is provided, Freddie's average loan size for its portfolio of Alt-A loans was used.
[131] Freddie Mac 2008 Second Quarter Financial Results p. 26 lists five features totaling $588 billion, to which sum a sixth feature (FICO of 620-659 in the amount of $164 billion) must be added, This brings the total to $752 billion. See Appendix 2 for detail regarding the calculation of Freddie's loans with a FICO of 620-659.

Freddie's seventh and final key category (Combined LTV >90%) may now be addressed. Freddie noted in its 2008 Quarter 2 10-Q: [132]

> "In prior years, as home prices increased, many borrowers used second liens at the time of purchase to reduce the LTV ratio on first lien mortgages. Including this secondary financing by third parties, we estimate that the percentage of first lien loans we have guaranteed that have a total original LTV ratio above 90% was approximately 14% at both June 30, 2008 and December 31, 2007.

Freddie's percentage of Original LTV >90% (without counting the impact of simultaneous 2nds) is 8%.[133] As a result, $110 billion of its portfolio at 6.30.08 consists of loans with a Combined LTV >90%.[134] The overlap between this product characteristic and the six that have already been addressed is estimated at 70%, yielding $33 billion. Assuming these loans have an average balance equal to Fannie's average loan amount of $152,814 for key product features yields a net 0.216 million loans.

For the 7 product features that comprise Freddie's single-family credit guarantee portfolio of Subprime by Characteristic, Self-denominated Alt-A and Alt-A by Characteristic loans,, the net dollars are $635 billion ($602 billion plus $33 billion) and the net number of loans is 4.155 million (3.939 million plus 0.216 million).

4. **Additional GSE subprime and Alt-A loans from SEC suit and GSE disclosures after 2009**

Appendix 3 contains a table and related footnotes that summarize the additional subprime and Alt-A loans discovered and disclosed by the SEC in connection with its suit against three of the top officials of both Fannie and Freddie, and the additional subprime and Alt-A loans that were contained in data releases by the GSEs after 2009. Some of these loans duplicate mortgages that were already known and included in the analysis above, but the numbers in the table are net of those duplications.

The table in Appendix 3 shows that the SEC discovered and disclosed GSE subprime loans with an unpaid principal value of $325.7 billion (prior to deduping: $339.7)[135], which translate into 2.4 million loans with an average size of $13770 per loan[136], and 0.9 million GSE Alt-A loans with an unpaid principal amount of $138.4 billion (prior to deduping: $692.2 billion) and an average size of $152,814.[137] These additional loans have been included in the total in Table 1.

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[132] Freddie Mac Quarter 2 10-Q, p. 60.
[133] Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 26.
[134] The 6% difference times Freddie's $1.837 trillion total single-family portfolio yields $110 billion before deduping.
[135] There are 12 columns of subprime and Alt-A loans listed in Appendix 3. To take into account that a loan that might belong to more than one column, the totals are deduped as the columns move from left to right.
[136] Average loan amount for GSE loans with a FICO score of less than 660.
[137] Average loan amount for GSE loans with six key product features (Alt-A) as noted earlier.

Section E: Detail of Government loan contributions to total subprime and Alt-A loan exposure

1. **Determining the contribution by government loans to Subprime and Alt-A:**

   The MBA's National Delinquency Survey (NDS) for Q2:08 reports that FHA and VA respectively had 3.492 million and 1.122 million loans outstanding.[138] The NDS does not report rural housing program loans; however loan volume at that time was small. Grossing up using an 82.5% coverage factor [139]yields 5.59 million government loans (3.492 million divided by 0.825 equals 4.23 million plus 1.122 divided by 0.825 equals 1.36 million).

   For the period in question, approximately 83% of FHA loans consisted of high Original LTV lending (Original LTV>90%) and approximately 70% had a FICO of <660.[140] Given these high percentages it is highly probable that at least 90% of FHA loans have one of these two characteristics (0.90 times 4.23 million equals 3.81 million). While similar data is not available for the smaller volume VA and rural housing loan programs, I believe that at least 70% of these loans also have one of these two characteristics (0.7 times 1.36 million equals 0.95 million). FHA loans have an average loans balance of $103,300,[141] and this yields a total loan balance of $394 billion. I believe VA's average is closer to $150,000, which yields a total loan balance of $143 billion.

   This results in $537 billion in net loan dollars ($394 billion plus $143 billion) and 4.76 million loans (3.81 million FHA loans plus 0.95 million VA/rural loans)).

Section F: Detail of FHLBs' contributions to total subprime and Alt-A loan exposure

1. **FHLBs' holdings of Subprime Private MBS and Alt-A Private MBS as of 6.30.08:**

   As of year-end 2008, various FHLBs were reported to hold $76 billion in private MBS.[142] While little has been disclosed regarding the type of private MBS making up this portfolio, it would be reasonable to assume that 66% of the total or $50 billion would be backed by Alt-A and subprime loans.[143] Based on an average loan amount of $160,000 (blended average used for Fannie and Freddie's holdings of Private MBS and Alt-A Private MBS), this results in 0.313 million loans.

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[138] National Delinquency Survey, Mortgage Bankers Association, Q208

[139] Over the period Q.1:08 to Q.3:09, the MBA reported that it covered over 80% of outstanding first-lien mortgages, between 80% and 85% of outstanding first-lien mortgages, and approximately 85% of outstanding first-lien mortgages. The total number of loans reported by the NDS varies by no more than 800,000 over this time period, indicating that the variance in the total number of mortgages outstanding over this period was at most 1 million loans. I have used a midpoint of 82.5% coverage.

[140] Data derived from 2009 Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund, pp. 42 and 44

[141] Derived from the FHA Biweekly report for July 16-31, 2008 found at: http://www.hud.gov/offices/hsg/comp/rpts/ooe/ol2009.pdf

[142] http://uk.reuters.com/article/idUKTRE5077I320090108

[143] Inside Mortgage Finance data indicates that 66% of private MBS issuances over 2004-2007 were either Alt-A or subprime.

Section G: Detail of Community Reinvestment Act (CRA) contributions to total subprime and Alt-A loan exposure

Two federal programs resulted in CRA or CRA-like single-family mortgage originations:

1. Loans undertaken to meet CRA requirements (CRA Loans).

2. Loans undertaken pursuant to HUD's "Declaration of Fair Lending Principles and Practices" (HUD Program and HUD Program Loans). As CRA applied only to banks and thrifts, in 1994, HUD established this companion program for mortgage bankers.[144] Like CRA, it had as its goal increasing affordable housing opportunities and addressing obstacles facing homebuyers by providing products and programs that help bring home ownership to those who are under-served. To this end, it encouraged the use of underwriting guidelines that were as "flexible" as possible.[145]

CRA and HUD Program Loans were not tracked in any organized manner. There is, however, a substantial amount of loan origination volume information available with respect to five of the largest participants. With this and other information an estimate may be made as to the volume of CRA and HUD Program Loans outstanding at 6.30.08. This information includes:

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[144] "Countrywide Is First Mortgage Lender to Voluntarily Agree to Fair Lending Goals with HUD" PASADENA, Calif., Sept. 14, 1994, PRNewswire: "The nation's largest mortgage lender and servicer, Countrywide Funding Corp., signed a voluntary Declaration of Fair Lending Principles and Practices ("Declaration") with the U.S. Department of Housing and Urban Development (HUD) -- the first such document -- underscoring Countrywide's commitment to increase the number of home loans made to minority and low-income borrowers….Countrywide implemented its House America program in October 1992…. Countrywide has made a $5 billion commitment with Fannie Mae and Freddie Mac to make such loans in 1994/1995 under its House America program."

Additional Countrywide commitments:

- In 2000 $80 billion in community development lending included as a provision in Countrywide's reaffirmation of its 1994 HUD agreement (noted in *Mortgage Banking*, May 1, 2000);
- In 2001 an expanded $100 billion in community development lending through 2005. This goal was exceeded by early 2003 (Countrywide press release dated May 14, 2001);
- In 2003 an expanded $600 billion goal, extended to 2010 (noted in *Mortgage Banking*, Feb. 2005); and
- In 2005 an expanded $1 trillion goal (noted in *Mortgage Banking*, Feb. 2005).

From the point in time Countrywide started participating in HUD's program, it went from being the 22nd largest subprime originator in 1996 (as far back as the data goes) to the 7th largest in 2000, finally to the 3rd largest in 2004 through 2007. During the period 2004-2007 it was either the nation's largest or second largest Alt-A lender. During the period 1995-2007 it was, on a combined basis, Fannie and Freddie's largest lender nine times and 2nd largest lender four times. In 2007 it accounted for 29% and 18% of Fannie and Freddie's acquisitions respectively. This was up from 17% and 8% respectively in 1995. Source: Inside Mortgage Finance

[145] See Appendix 1"Since 1994, HUD has signed Fair Lending Best Practices Agreements with lenders across the nation that are individually tailored to public-private partnerships that are considered on the leading edge. The Agreements not only offer an opportunity to increase low-income and minority lending but they incorporate fair housing and equal opportunity principles into mortgage lending standards. These banks and mortgage lenders, as represented by Countrywide Home Loans, Inc., serve as industry leaders in their communities by demonstrating a commitment to affirmatively further fair lending." http://www.hud.gov/local/hi/working/nlwfal2001.cfm

1. Announcements of CRA commitments (CRA Commitments) that were tracked by the National Community Reinvestment Coalition (NCRC). In 2007 NCRC published data indicating that from 1994 to 2007, CRA Commitments totaled $4.5 trillion (NCRC 2007 Report). An analysis of the commitments indicated that 94% of those announced were made by Bank of America, JP Morgan Chase, Citibank, and Wells Fargo or banks and thrifts that these banks purchased or merged with;[146]
2. Countrywide Funding announced its commitments made pursuant to its participation in the HUD Program (HUD Commitments);
3. Other CRA loans were originated by banks and thrifts without having first announced a CRA Commitment. These loans are particularly difficult to identify and size;
4. Most loans originated pursuant to the Community Development Programs were single-family; [147]
5. As will be demonstrated below, announced CRA Commitments went on to be filled; and
6. Fannie data indicated that ninety-eight percent of its loans that were outstanding as of 6.30.08 were originated in 2001 or later. Given Fannie's large size and high percentage of affordable housing loans, this percentage is useful in estimating the volume of Community Development Loans outstanding at 6.30.08.[148]

While these facts make it is possible to develop a robust estimate of the single-family CRA and HUD Program Loans that were made as a result of announced commitments and were outstanding as of June 30, 2008, we don't have nearly as detailed information as to where these loans ended up (Fannie, Freddie, FHA, Subprime Private MBS or bank portfolios) or their characteristics. As a result, the later part of this analysis on CRA and HUD Program Loans requires more in the way educated guesses.

Washington Mutual (WaMU), JP Morgan Chase (Chase), Citibank (Citi), Bank of America (B of A), and Countrywide Funding (CWF) either published annual reports or issued press releases detailing their activities pursuant to their announced CRA Commitments. In addition, WaMu, Chase, Citi, and B of A, reported their actual loan volumes undertaken in furtherance of each bank's CRA Commitment(s) as reported in NCRC 2007 Report. CWF reported its loan volume in terms of progress made in fulfilling its HUD Commitments.

[146] Source: National Community Reinvestment Coalition's 2007 CRA Commitments report found at: http://www.community-wealth.org/_pdfs/articles-publications/cdfis/report-silver-brown.pdf. Note: commitments generally represent a multi-year, multi-product commitment to originate CRA loans. Loans made under CRA Community Lending Programs can be single-family, multi-family, commercial, or other types of loans.

[147] CRA Community Development Program lending by banks was heavily weighted to single-family lending. For example, JP Morgan Chase announced an $800 billion community development commitment in 2004, of which $675 billion (84%) was committed to home mortgages. CRA Community Development Program lending by thrifts was even more heavily weighted to single-family lending, as that was the main business of thrifts. Likewise, with the HUD Community Development Program lending, as it was applicable to mortgage bankers, whose business almost entirely related to single-family lending.

[148] Based on Fannie's experience as set forth in its Second Quarter 2008 10-Q, p. 75.

Table 4 ($ in billions) - lists single-family originations only:

Lender	2001	2002	2003	2004	2005	2006	2007	2008 (½ year)[149]	Total all years
WaMu[150]	$20	$40	$80	$50	$65	$45	$32	NA	$332
Chase[151]	$40	$60	$82	$54	$68	$75	$62	$62	$503
Citi[152]	$10	$14	$26	$67	$50	$43	$62	$2	$274
B of A[153]	$20	$20	$20	$20	$35	$44	$54	$16	$229
CWF[154]	$50	$50	$130	$111	$150	$165	$133	NA	$789
Total	$140	$184	$338	$302	$368	$372	$343	$80	$2,127
Est. balance at 6.30.08[155]	$13	$37	$135	$151	$254	$283	$295	$80	$1,248
Est. balance at 6.30.08 grossed up to include balance of CRA and	$16	$46	$169	$189	$318	$354	$369	$100	$1,561

149 2008 originations were reduced by 50% to approximate originations during the first 6 months of the year.
150 According to the NCRC's 2007 report, WaMu announced a $75 and $120 billion CRA commitments in 1997 and 1998 respectively. Based on these commitments and WaMu's estimated 2002 volume, $20 billion for 2001 would be reasonable. Washington Mutual's 2006 and 2007 Community Annual Reports were the source for 2002-2007. WaMu announced that it had fulfilled its $375 billion commitment made in 2002 and that single-family originations contributing to this total amounted to $312.8 billion, with actual amounts given for 2006-2007. This $312.5 billion was spread over the 2002-2007 period. WaMu was purchased by Chase in 2008.
151 "Making Dreams Come True: The Chase Dream Maker Commitment in Action", Chase press release dated July 14, 2004 source for 2001-2003. Noting a $500 billion pledge made by its mortgage lending unit (Chase Home Finance), Chase noted that $182 billion in single-family loans had been originated during the previous 3 years. This $182 billion was spread over the 2001-2003 period. "JP Morgan Chase invests $153 billion in low- and moderate-income families, communities and small businesses JP Morgan Chase press release dated September 19, 2006 source for 2004-2005. "Chase Invests $338 Billion in Low- and Moderate-Income Families, Communities and Small Businesses in Four Years" Chase press release dated May 13, 2008 was the source for 2006-2007. Chase notes a cumulative $259 billion in mortgage originations to minority- and lower-income borrowers made over 2004-2007. This $259 billion was spread over the 2004-2007 period. Lending was pursuant to Chase's $800 billion CRA Community Lending Program commitment announced in 2004. In a report entitled "Reaching out to homebuyers" Chase noted: "In the [$800 billion] program's first five years, Chase made about $380 billion in loans toward its goal of $675 billion in mortgage lending." This was an increase of $121 billion over the year-end 2007 total.
152 Citigroup "Citizenship Reports 2005, 2006, and 2007" and "Community Relations" report source for 2008.
153 According to the NCRC's 2007 report, NationsBank (purchaser of B of A) announced a $350 billion CRA commitment in 1998. Based on this commitment and B of A's estimated 2005 volume, an estimate of $20 billion for 2001-2004 would be reasonable. B of A table showing 2005-2007 total single-family community development originations of $133 billion and 2007 single-family community development originations of $54 billion. The $79 billion remainder for 2005-2006 was divided between the two years. Community Development link of B of A's web site. In 2008, B of A provided $31 billion in affordable housing.
http://www.bankofamerica.com/community/index.cfm?template=cdb_threefiftybillionni
154 As noted in *Mortgage Banking*, Feb. 2005, CWF's previous commitment [$600 billion] covered the years 2001–2010 and provided $341 billion of home loans as of Dec. 31, 2004. This amount was spread over 2001-2004. In a question and answer statement released by CWF in late-2007 it noted $789 billion in loan originations towards its $1 trillion goal. (http://www.realtown.com/articles/view/questions-and-answers-from-countrywide-about-lending). This $448 billion increase over the 12.31.04 total was spread over 2005-2007. B of A acquired CWF in 2008.
155 See Appendix 4

HUD Program Loans (Prior line times 1.25)[156]									

An estimated single-family CRA and HUD Program Loan total of $1.561 trillion remaining at 6.30.08 and an average loan balance of $139,000 yields an estimated 11.2 million Community Lending loans.[157] This analysis demonstrates that an estimated $1.5 trillion (11.2 million loans) in Community Lending was outstanding as of 6.30.08. *A crucial question that must be addressed in detail is: where are these loans today, what are their characteristics, and how are they performing? This answer can easily be gotten from the three survivors (Chase, Citi, and B of A), which have detailed records on 80% of these loans.*[158]

Given the Community Development Programs' targeted income requirements and goals of flexible underwriting, it is reasonable to assume that most of these loans (say 60% or 6.7 million) had either subprime (FICO below 660) or Alt-A characteristics (High Original LTV, High Combined LTV, or other flexible underwriting standards). Most of these loans (estimated at 65%) are believed to have been acquired by Fannie and Freddie or insured by FHA and have already been included in the counts for Fannie, Freddie and FHA. The balance (35%) ended up in Subprime Private MBS and lenders' portfolios. As a result, 60% of this 35% balance, or about 20%, are estimated to be Subprime or Alt-A Loans found in Subprime Private MBS or lenders'.

Subprime and Alt-A Community Lending loans placed in Subprime Private MBS or remaining in lenders' portfolios total $312 billion ($1.561 trillion times 20%) and 2.24 million loans (11.2 million loans times 20%).

[156] The CRA and HUD Program Loans documented in Table 3 represent the production of 5 large lenders. There are over 7000 additional bank and thrift lenders subject to CRA and over 100 lenders participating in HUD's Program. Assuming that the 5 documented lenders account for 80% of Community Lending, the remaining lenders would conservatively add 25% to #6.

[157] Derived from Fannie Mae 2008 10-K Investor Summary p. 5. The blended average loan amount ($139,000) for loans with a FICO<660 and original LTV >90% was calculated. This is representative of Community Lending loans.

[158] Of the original five lenders, four were major Self-denominated Subprime lenders. In 2006 CWF was ranked #3 with a 6.8% share, CitiMortgage was ranked #4 with a 6.3% share, WaMu was ranked #11 with a 4.4% share and Chase was ranked 17 with a 1.9% share. Total share for these four banks was 19.4%.,

Appendix 1 of Study 2

Additional background on HUD's Community Lending Programs and its Fair Lending Best Practices Agreements.

HUD reports on its website:

> "Since 1994, HUD has signed Fair Lending Best Practices Agreements with lenders across the nation that are individually tailored to public-private partnerships that are considered on the leading edge. The Agreements not only offer an opportunity to increase low-income and minority lending but they incorporate fair housing and equal opportunity principles into mortgage lending standards. These banks and mortgage lenders, as represented by Countrywide Home Loans, Inc., serve as industry leaders in their communities by demonstrating a commitment to affirmatively further fair lending."[159]

I believe that the Fair Lending Best Practices Agreement that was entered into between HUD and Investor Lending Services (ILS) is representative. It provides:

> "As a mortgage lender, we are committed to increasing affordable housing opportunities and addressing obstacles that face today's homebuyers, by providing products and programs that help bring home ownership to those who are under-served."

and

> "It is ILS' policy and expectation that every loan applicant will be considered for financing, where available. In addition an alternative loan product may be offered or recommended based upon the applicant's credit history and the interest rate desired, as well as the terms and conditions of the loan. ILS may engage in advertising campaigns or targeted solicitations with respect to alternative loans."

and

> "ILS is committed to taking a leadership role in the lending community, by supporting affordable housing programs which benefit our communities and contribute towards helping people finance their investment properties. We realize that participating in such programs not only benefits society as a whole but contributes to the continued viability and financial well being of ILS."

and

[159] Found at: http://www.hud.gov/local/hi/working/nlwfal2001.cfm

> "An element of judgment and subjectivity enters into all underwriting decisions. To give the widest possible latitude to good judgment, the underwriting guidelines are developed to be as flexible as possible."[160]

By 1997 HUD had entered into 117 such agreements.[161]

This program appears to have made a significant contribution to the flexible lending policies espoused by the federal government and is a significant and appropriate area for inquiry.

[160] Found at: http://ilsfunding.com/equal_housing.htm
[161] Found at: http://www.hud.gov/offices/fheo/39steps.pdf

Appendix 2 of Study 2

FICO 620-659 held by Fannie and Freddie as of 6.30.08:

Type	Number of loans	$ amount
Fannie		
620-659 FICO[162]	1.882 million	$267 billion
Freddie		
620-659 FICO[163]	1.148 million	$164 billion

[162] Fannie Mae 2008 Q. 2 10-Q p. 74 indicates that 10% of the single-family book of business had a FICO of 620-659. Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30 indicates that the single-family book of business totaled $2.667 trillion, resulting in $267 billion of loans with a FICO of 620-659. Fannie Mae 2008 Credit Supplement p. 5 indicates an average loan size of $141,748 for loans with a FICO of 620-659 resulting in 1.882 million loans.

[163] Freddie Mac disclosed the dollar amount of its exposure to loans with a FICO of 620-659 in its Fourth Quarter 2008 Financial Results Supplement p. 15. Number of loans derived from total unpaid principal balance and average unpaid principal loan balance per loan ($143,177).

Appendix 3 of Study 2

Fannie and Freddie high risk loan exposure at June 30, 2008																				
All data as of 6.30.08, and except as otherwise noted is from Fannie's and Freddie's Q2:08 10-Qs and Investor Summary/Credit Supplement. $ in billions		Risk relating to whole loans													% of total single-family mortage exposure (credit book)	Risk related to private-label mortgage backed securities (PLMBS).				% of total single-family mortage exposure (credit book & PMBS)
	Total single-family mortgage exposure (inc. Private Label MBS)	Subprime (as defined by Fannie/ Freddie in respective 10-Qs)	Additional subprime as set forth in SEC Non-Prosecution Agreements. fn1, fn2	Additional subprime (as generally defined by bank regulators fn3)	Alt-A loans--Catagory 1: remaining high risk loans as listed in the respective credit supplements (deduped for multiple risk characteristics in black, undeduped amounts in red) fn4				Alt-A loans--Catagory 2	Alt-A loans--Catagory 3	Alt-A loans--Catagory 4: from GSEs' loan performance data set									
		Subprime category 1	Subprime category 2	Subprime category 3: FICO <660 fn5	Original LTV >90% (effectively means 95%+)	Interest only	Option Arm	[Self-denominated] Alt-A	CLTV >90% (when simul 2nd added, effrectively means 95%+) fn6, fn7	Additional Alt-A as set forth in SEC Non-Prosecution Agreements fn8	DTI>42% (30 year fixed rate fully documented) fn9	Rate and term >80% CLTV (30 year fixed rate fully documented) @93% based on random sample. fn10	Cash out >75% CLTV (30 year fixed rate fully documented) @92% based on random sample.fn11	Subtotal (Subprime Categories 1-3 and and Alt-A Catagories 1-4)	% of total single-family mortgage exposure (exc. PLMBS)	Subprime	Alt-A	Subtotal	Grand total	% of total single-family mortgage exposure (inc. PLMBS)
Fannie (deduped)	$2,730.0	$8.0	$93.7	$292.7	$571.0				$41.6	$68.20	$209.89	$18.76	$50.9	$1,354.7	50.8%	$36.3	$29.5	$65.8	$1,420.5	52%
Fannie (not deduped)		$8.0	$101.7	$394.4	$277.2	$216.4	$19.1	$307.0	$126.0	$341.0	$331.16			$2,122.0		$36.3	$29.4	$65.7	$2,187.7	
Freddie (deduped)	$1,970.0	$6.0	$232.0	$78.5	$353.0				$22.8	$70.20	$153.46	$18.15	$49.87	$984.0	53.4%	$84.7	$43.1	$127.8	$1,111.8	56%
Freddie (not deduped)		$6.0	$238.0	$240.0	$145.0	$164.1	$13.0	$190.0	$69.0	$351.0	$220.6			$1,636.7		$84.7	$43.1	$127.8	$1,764.5	
Combined (deduped)	$4,700.0	$14.0	$325.7	$371.2	$924.0				$64.4	$138.4	$363.4	$36.9	$100.7	$2,338.7	51.9%	$121.0	$72.6	$193.6	$2,532.3	54%
Combined (not deduped)		$14.0	$339.7	$634.4	$422.2	$380.5	$32.1	$497.0	$195.0	$692.0	$551.7			$3,758.6		$121.0	$72.5	$193.5	$3,952.1	

Appendix 3 continued of Study 2

1 Freddie's additional subprime as agreed to in its Non-Prosecution Agreement (NPA) was coded C1, C2, and EA. The CI and C2 subprime codes were established 1998 and were based on characteristics of the then self-denominated A-minus and below segments of the subprime market. The main determinants were risk layering resulting from a FICO of <680 FICO (these FICOs accounted for the bottom 20-25% of all new mortgage records), total debt-to-income ratio >45%, and total LTV >90% (effectively >=95% LTV). The EA subprime designation was added by Freddie in 2004 and was identical to Fannie's EA designation. In Fannie's NPA it did not dispute the SEC's allegation that EA loans were subprime. It appears reasonable about 2/3 of the loans designated by Freddie as subprime (C1, C2, and EA) would have had a FICO <660 and also accounted for about 2/3 of all Freddie's loans with a FICO <660. The Freddie data sheds additional light on Fannie's subprime holdings. Two-thirds of Freddie's subprime loans resulted from loan approvals underwritten by automated underwriting systems other than its own Loan Prospector (LP) with about 45% of its undisclosed subprime loans coming from Fannie's Desktop Underwriter (DU) approvals. Eventually Freddie bought more loans through Fannie's DU than its own LP. Fannie did not dispute the SEC's allegation that its EA loans were not disclosed as subprime. In the Fannie complaint the total for EA and My Community Mortgages (another subprime category) totaled $101.7 billion.

2 Given the high defect rate noted in fn 1 for Fannie accepts acquired by Freddie, application of Freddie's subprime definition to Fannie would likely result in $400 billion in Fannie subprime acquisitions rather than the $101.7 bill set out in the SEC complaint. This $300 billion in additional subprime loans are not accounted for in this tabulation. However, about two-thirds of these are included in the <660 FICO category.

3 See Federal regulators - 2001: Expanded Guidance for Subprime - http://www.federalreserve.gov/Boarddocs/SRletters/2001/sr0104a1.pdf
The Fair Isaac Company (FICO) reviewed credit files relating to mortgage loans originated for the period 2005-2008. It applied the proposed Qualified Residential Mortgage (QRM) credit history criteria (cannot be currently 30 days late, cannot be 60 days late in the last two years, and no bankruptcy, foreclosure, or short sale in the last 36 months). This is a looser definition that the one adopted by the federal regulators in 2001, in that it allows up to two 30-day lates in the

4 These four categories have been deduped using the overlap calculation first disclosed by Fannie in its Q2:09 Credit Supplement. Loan with key product features (all high risk) were listed and a total was provided that eliminated any double counting due to an individual loan having more than one high risk feature. Seven categories were listed (FICO <620, FICO >=620 & <660), original LTV >90%, Alt-A, Interest Only, Option ARM, and [self-denominated] subprime. As this relationship would have experienced minimal change over the previous 12 months, it may be used to calculate the overlap relationship for the same categories of high risk loans at 6.30.08.
1. 6.30.09 Fannie's total for these seven risk categories was $1,111.7 billion and the deduped total was $878.2 billion resulting in a deduping multiplier of 79%.
2. At 6.30.08 Fannie's total for these seven risk categories was $1,222.1 billion. Multiplying this total by the deduping multiplier of 79% yields a deduped total of $965 billion.
3. The deduped total for just the loans with original LTV >90%, Alt-A, Interest Only, and Option ARM may now be calculated.
a. The [self-denominated] subprime risk feature was the smallest one at ($7.9 billion) and had an average FICO of 623. Therefore it may reasonably be assumed that virtually all of these are also included in the two FICO related risk categories.
b. There is no overlap between the two FICO related risk categories (<620 and >=620 & <660) as they are mutually exclusive.
c. By subtracting the totals for two FICO related risk categories ($394.4 billion) from the depuped total of $965 billion, the unique deduped contribution of the these four risk characteristics is $571 billion.
d. The same methodology may be applied to determine Freddie's deduped totals for the same four categories. At 6.30.08 Freddie's total for its six risk categories was $752 billion (Freddie did not include its $6 billion of [self-denominated] subprime in its total). Multiplying this total by the deduping multiplier of 79% yields a deduped total of $594 billion. By subtracting the totals for two FICO related risk categories ($240 billion) from the depuped total of $594 billion, the unique deduped contribution for these four risk characteristics is $353 billion.

5 Deduped totals for Fannie <660 FICO have been reduced by 100% of lt EA/MCM loans. The EA/MCM loans had FICO and performance profiles worse than Fannie [self-denominated] subprime and 53% of EA had a FICO <620. Deduped totals for Freddie <660 FICO have been reduced by two-thirds of lt C1/C2/EA totals based on Freddie experience as noted in fn1.

6 CLTV >90% - Fannie reports on p. 128 of its 2007 10-K that 15% of its entire book had an original combined LTV >90%. Its OLTV percentage >90% (without counting the simultaneous 2nd) is 9.9%. This means an additional 5.1% of its portfolio is over 90% CLTV at origination (where the 2nd was disclosed, however they admit that this data is likely on the low side). Freddie reports on p60 of its Q2:2008 10 Q that 14% of its portfolio had an original combined LTV >90% (1st + simultaneous 2nd). Its OLTV percentage >90% (without counting the simultaneous 2nd) is 8%. This means another 6% ($69 billion before deduping) of its portfolio is over 90% CLTV at origination (where the 2nd was disclosed, many are not).

7 CLTV >90% - overlap - assumed to be two-thirds. Fannie: deleted 10.5% for <620 FICO overlap (same % as OLTV >90%) and deleted an estimated 20% for 620-659 FICO (used 2x incidence in overall portfolio, same incidence as found for <620 FICO, Freddie: deleted 10% for <620 FICO overlap (same % as OLTV >90%) and deleted an estimated 25% for 620-659 FICO (used 2.5x incidence in overall portfolio, same incidence as found for <620 FICO) and deleted 60% for overlap with [self-denominated] Alt-A.

8 Little in the way of layering information is provided in the SEC materials regarding these additional Alt-A loans. While large in quantity, a conservative assumption has been made that 80% have already been accounted for in other catego

Appendix 4 of Study 2

$ in billions	2001	2002	2003	2004	2005	2006	2007	2008 (1st half)	Total
1. Fannie's originations by year[1]	$568	$804	$1,322	$588	$537	$524	$651	$252	
2. Orig. year (by %) of total loans of $2.667 outstanding at 6.30.08[2]	2%	6%	20%	11%	14%	15%	21%	9%	
3. $ based on % in #2. times $2.667	$53	$160	$533	$293	$373	$400	$562[3]	$252[4]	
4. % of year still outstanding (#3. divided by #1.)	9%	20%	40%	50%	69%	76%	86%	100%	
5. $ of Community Lending from Table 3	$140	$184	$338	$302	$368	$372	$343	$80	$2,127
6. Est. amount left (#4. times #5.)	$13	$37	$135	$151	$254	$283	$295	$80	$1,248
7. Gross up for balance of Community Lending by banks and thrifts (#6. times 1.25)[5]	$16	$46	$169	$189	$318	$354	$369	$100	$1,561

[1] Source: 2001-2006 - FHFA Mortgage Markets and the enterprises (Table 1) http://www.fhfa.gov/webfiles/682/MortgageMarkets2006.pdf. 2007 and 1st ½ of 2008

[2] Based on Fannie's experience as set forth in its Second Quarter 2008 10-Q, p. 75.

[3] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 31

[4] Id.

[5] The Community Lending documented in Table 3 represents 5 large lenders. There are over 7000 additional bank and thrift lenders subject to CRA. Assuming that the 5 documented lenders account for 80% of Community Lending, the remaining lenders would conservatively add 25% to #6.

Study 3 with corrections and edits through January 6, 2015

High LTV, Subprime and Alt-A Originations over the Period 1992-2007 and Fannie, Freddie, FHA and VA's Role

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In prior memoranda I have outlined an inventory of the "stock - the number and dollar amount of subprime and Alt-A loans outstanding in the housing finance system before the financial crisis hit in September 2008. In this I am detailing the "flow" – the number and dollar amount of such loans that were originated between 1992 and 2008. This flow study has not been updated based on the new data due to spotty availability over the flow period. I also outline in detail how I arrived at subprime and Alt-A originations over the period 1992-2007, along with Fannie, Freddie and FHAs participation and domination of these loan types over the same period.

Section A: Definitions

1. Relevant definitions from my "Sizing Total Exposure to Subprime and Alt-A Loans in U.S. First Mortgage Market as of June 30, 2008."

Subprime Loans: In general, these are loans to borrowers with "weakened credit histories that include payment delinquencies and possibly more severe problems such as charge-offs, judgments, and bankruptcies."[1] There are two varieties of subprime loans:

Self-denominated Subprime or SD Subprime: These are loans denominated or classified as subprime by the originator or the securities issuer and had one or more of the following characteristics:

7. Originated by a lender specializing in subprime business or by subprime divisions of large lenders;
8. Placed in a subprime private MBS (Subprime Private MBS); or
9. Had a rate of interest considered "high" under HOPA.

Not Initially Classified as Subprime or Subprime by Characteristic or Subprime by FICO: Loans with a FICO score of less than 660. The origin of the use of a FICO score below 660 as the demarcation between prime and subprime loans goes back to 1995. As noted in January 1997 by Standard & Poor's, "…a FICO score of 660 [is] the investment-grade score as defined in Freddie Mac's industry letter of August 1995."[2] In 2001 federal regulators issued "Expanded Guidance for Subprime Lending Programs" which set forth a number of credit characteristics for subprime borrowers including:

[1] See Appendix 1
[2] S&P Structured Finance Ratings, January 1997, p. 14

"Relatively high default probability as evidenced by, for example, a credit bureau risk score (FICO) of 660 or below (depending on the product/collateral).[3]

Both GSEs implicitly acknowledge this demarcation point in their respective delineations of their mortgage credit portfolios by key risk characteristics, each of which has a high likelihood of default.[4] Fannie, for example, lists risk characteristics and related serious delinquency (SD) rates for FICOs of <620 (16.08% SD) and FICOs of 620-659 (11.32% SD). Other high volume high risk categories listed include interest only loans (17.94% SD), Original LTV >90% (11.56% SD), and Alt-A (13.97% SD).[5] Fannie's SD rate on its traditionally underwritten loans (those loans without any of these high risk characteristics) is 1.78%.[6] Loans with a FICO of <620 and 620-659 have a default probability 9 times and 6.4 times, respectively, the default probability of traditionally underwritten loans.

Alt-A Loan: These loans either had low or no documentation requirements or had some feature that was "alternative to agency" (hence, "Alt-A")—i.e., did not meet the traditional underwriting guidelines of the GSEs in such characteristics as Original LTV, Combined LTV, debt ratio, rules for loans on investment properties, rules on cash-out refinances, condominium guidelines, special income definitions, low start rates, or negative amortization ARMs.

There are two varieties of **Alt-A Loans**:

Self-denominated Alt-A or SD Alt-A: Loans initially classified as Alt-A generally had one or more of the following characteristics:

3. Lender delivering loan initially classified it as Alt-A based on documentation or other features, or
4. Placed in an Alt-A private MBS (Alt-A Private MBS).

Not Initially Classified as Alt-A or Alt-A by Characteristic: Loans not initially classified as Alt-A which had:

6. Non-traditional ARM terms such as low start ("teaser") rates or no or negative amortization. These could be in either private MBS or whole loan form (note: these characteristics could not be tracked for the time period in question);
7. High Original LTV including 97% Original LTV and 100% Original LTV loans, along with 95% Original LTV loans with non-traditional underwriting guidelines and debt ratios. For the period in question, virtually all Original LTV >90% lending had one or more of these characteristics. This lending may also be referred to as Original LTV >90%; or
8. High Combined LTV where a combined 1st and 2nd lien was used to reduce the down payment required. This lending commonly involved an 80% 1st and a 20% second. This lending may also be referred to as Combined LTV >90%

FHA Loans: Loans insured by FHA. For the 2002-2007 loan books, approximately 83% of FHA loans consisted of High Original LTV lending (Original LTV>90%) and approximately 70% had a

[3] See Appendix 1.
[4] Fannie Mae 2009 Third Quarter Credit Supplement, p. 5, found at: http://www.fanniemae.com/ir/pdf/sec/2009/q3credit_summary.pdf and Freddie Mac Third Quarter Results Supplement p. 18 found at http://www.freddiemac.com/investors/er/pdf/supplement_3q09.pdf
[5] Fannie Mae 2009 Third Quarter Credit Supplement, p. 5
[6] Id. Derived from data found on p.5

FICO of <660[7]. FHA is projecting a 21% and 24% claims rate[8] for its 2006 and 2007 book years respectively. While similar data is not available for the smaller volume VA and rural housing loan programs, Original LTV distributions are believed to be similar.

Original loan-to-value or Original LTV: The loan-to-value relationship at the time of loan origination of the first mortgage and the value of the home being financed.

Combined loan-to-value or Combined LTV: The loan-to-value relationship at the time of loan origination of the combined amounts of first mortgage and second mortgage and the value of the home being financed.

2. Additional definitions:

Home Purchase Loan (HPL): The purpose of the loan was to finance a home purchase.

Refinance Loan (RL): The purpose of the loan was to refinance an existing home mortgage.

Government Loans: A loan insured or guaranteed by FHA or VA.

Conventional loan: Not a government loan.

[7] Data in or derived from 2009 Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund, pp. 42 and 44

[8] Id. Found at Appendix F-3. FHA insures loans against loss from default. When there is an insured loss, FHA pays a claim. Losses generally result from a foreclosure. FHA keeps track of the claims it pays or expects to pay by projecting a claims rate for each book year of insured loans. A projected claims rate of 24% means that FHA expects to pay 24 claims for every 100 loans insured.

Section B: Background

The beginning of the financial crisis extends back to the early-1990s. In the first half of the 1990s, the federal government adopted three policy initiatives that were intended to supplement the work of the Federal Housing Administration (FHA), which had long been the federal government's main vehicle for higher risk home lending:

4. In 1992, Congress imposed affordable housing goals on Fannie and Freddie by Congress[9] and they became both competitors to FHA and a source of demand for CRA loans;
5. In 1994, HUD began to implement its "Fair Lending Best Practices Agreements" with lenders across the nation;[10] and
6. In 1995, the Community Reinvestment Act (CRA), which had been passed in 1977 but had had little impact on bank lending, was given new life with stronger regulations applicable to all insured banks.

The clear message to the private sector (including Fannie and Freddie) was to promote and expand low and moderate income home lending and use flexible underwriting standards such as lower downpayments to accomplish it.

These four initiatives covered most lenders and most of the secondary market. Each initiative either explicitly (FHA, CRA, and HUD) or implicitly (Fannie and Freddie) required the use of flexible lending standards. This policy was in place for about a dozen years. At the end of this period, our nation suffered a catastrophic and nationwide decline in home prices. It is for this reason that high risk loan origination trends going back to 1992 are important to an analysis of the causes of the financial crisis.

This information is also useful from the perspective of the stimulus applied to the housing market over the period 1993-2007. While the Case-Shiller House Price Index reached its price peak in mid-2006; the peak in the rate of increase for the Case-Shiller 10-City House Price Index (HPI) occurred in mid-2004 and for the 20-City HPI occurred in late-2004.[11] Likewise the peak in the percentage of homeownership was reached in 2004 after having risen for 10 straight years.[12] This increases the significance of the loans originated during the run-up to 2004 to any evaluation of the housing boom.

The fact that the above enumerated changes in federal housing policy occurred in the early- to mid-1990s and that prescient warnings about the potential risks presented by Fannie and Freddie go back many years is a compelling demonstration of the need to look at the mortgage market going back 18 years, not just 5 or 6.

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[9] Federal Housing Enterprises Financial Safety and Soundness Act of 1992
[10] See Appendix 1
[11] S&P Case-Shiller HPI
[12] U.S. Census Bureau

For example in 1998, Mr. Tom LaMalfa, in testimony before the House Subcommittee on Housing, warned:

> "Fannie and Freddie put taxpayers at risk. A meltdown similar to that of the FSLIC six to seven years ago could occur and taxpayers would be forced to come to the rescue given the nature of the implicit federal guarantees in these federal agencies' securities. Fannie and Freddie are at best mediocre mechanisms for directing subsidies to housing. The GAO concurs with this assessment. More than one dollar of every three gets spent before the consumers get the subsidy. Besides taxpayer risk and inefficiency, there are five other important reasons why Fannie and Freddie should be privatized: 1) they are siphoning most of the economic value from the mortgage business; 2) their special privileges impede the private sector's growth and financial opportunities; 3) they raise interest rates and indirectly increase the cost of the national debt; 4) they repeatedly have abused their charters; and 5) there is an almost inherent conflict in Fannie and Freddie's private and public roles. They are at odds. It is a zero-sum game: either shareholders and managers win, or taxpayers and the public win."[13]

Two years later, Mr. LaMalfa expressed deep concern about Fannie and Freddie's expanding role in subprime:

> "Development three found further and continued change in the subprime market with the disappearance of the independent firms. Profits appear to be far harder to come by, and the predatory lending issue continues to daunt the industry. Delinquency rates on these mortgages are high despite the current level of economic prosperity. Several states are discussing predatory lending legislation. Regrettably, the GSEs are playing politics with the issue, ostensibly to curry favor with certain Congressional and state legislators. And, speaking of Fannie Mae and Freddie Mac, let it be said that they now control the subprime market, having through their Alt A and A minus programs absorbed the largest and best parts of the "old" subprime world. What are left are the C and D segments. Combined, they only account for 20 to 30 percent of all subprime mortgages. (The old subprime market was about 15 percent of the total market.) Fannie/Freddie programs using risk-based pricing now encompass most mortgages with FICO scores of around 540 and up."[14]

This Study sets forth activity relating to a number of key data series. Unless noted, the each individual data series provides comprehensive coverage for the loan characteristic described:

1. High LTV lending (1992-2007)
   a. Conventional Home Purchase Loans
      i. Fannie Home Purchase Loans
      ii. Freddie Home Purchase Loans
   b. FHA Home Purchase Loans
   c. VA Home Purchase Loans

2. Subprime lending (1997-2007)
   a. Self-denominated Subprime
      i. Subprime Private MBS

[13] Testimony of Mr. Tom LaMalfa before the House Subcommittee on Housing on March 27, 1998
[14] Tom LaMalfa in the "Mortgage Corner column of the Holm Mortgage Finance Report, dated January 19, 2001.

b. Subprime by FICO (only for the following 3 categories)
    i. Fannie loan acquisitions (both Home Purchase and Refinance Loans)
    ii. Freddie loan acquisitions (both Home Purchase and Refinance Loans)
    iii. FHA insured loans ((both Home Purchase and Refinance Loans)
3. Alt-A lending (self-denominated only)
    a. Self-denominated Alt-A
        i. Self-denominated Alt-A reported by Inside Mortgage Finance (1992-2007)[15]
            a. Alt-A Private MBS (1995-2007)
        ii. Fannie loan acquisitions (2002-2007)
        iii. Freddie loan acquisitions (2002-2007)

This Study tracks high LTV, subprime and Alt-A activity over a 16 year period. There are certain data limitations resulting from the length of the time period involved. Two examples illustrate these limitations:

1. FICO scores are used to identify certain categories of subprime loans. FICO score were first developed in 1989 for consumer credit rather than mortgage credit. They did not come into generalized use in mortgage finance until the mid-1990s. As a result FICO data are not widely available prior to 1997. FICO score for all loans by year of originations is not generally available. The FICO series is limited to Fannie, Freddie, and FHA; and
2. The term "Alt-A" came into use in the early 1990s. Self denominated Alt-A volume developed slowly over the 1990s. 1995 was the first year for which data for both Alt-A loan and securities volumes was reported by Inside Mortgage Finance. Not all loans with Alt-A characteristics were identified as Alt-A.

[15] Inside Mortgage Finance (IMF) is the source for annual Self-denominated Alt-A originations. For the period for which Fannie and Freddie Alt-A purchase data is available (2002-2007) the total of Alt-A Private MBS and Fannie/Freddie Alt-A acquisitions substantially exceeds IMF's total Alt-A originations for a year. This appears to be due to an undercounting of Alt-A loans in the IMF totals. For that reason, I have concluded that the Fannie and Freddie Alt-A totals were not captured by IMF. The total of Self-denominated Alt-A for 2002-2007 consists of the sum of Self-denominated Alt-A loans reported by IMF and Fannie and Freddie.

Section C: Summary of Trends for High LTV, Subprime and Self-denominated Alt-A loan Activity

Table 2 summarizes the trends in three categories of Subprime and Alt-A lending over the period that the triggers of the financial crisis were developing. In all three instances various federal agencies dominated based on dollar volume. As the federal agencies tended to finance smaller mortgages, this dominance is even greater if computed on the basis of number of loans.

This summary also shows how Fannie and Freddie first became a competitor to and eventually overcame FHA in the area of High LTV Home Purchase lending. The process of crowding out the private sector by the federal agencies in subprime lending is also clear. Fannie and Freddie's role in Alt-A lending is murky as Fannie and Freddie did not classify many of their loans with Alt-A characteristics as Alt-A loans.[184]

[184] Fannie and Freddie used their various affordable housing programs and individual lender variance programs (many times in conjunction with their automated underwriting systems once these came into general use in the late-1990s) to approve loans with Alt-A characteristics, however they generally did not classify these loans as Alt-A. This practice started in the early-1990s. Many of the loans had higher debt ratios, reduced reserves, loosened credit requirements, expanded seller contributions, etc.

Table 1: Summary of Trends for High LTV, Subprime and Self-denominated Alt-A loan Activity

Section with detail	$ in billions	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total for yrs. under-lined
Section D	A. Total Home Purchase Loans (HPL) with High LTV	$87	$100	$159	$156	$173	$176	$218	$231	$205	$273	$307	$300	$308	$271	$321	$366	$2,976
	1. Fannie	NA	NA	NA	NA	NA	$18	$25	$36	$33	$50	$53	$68	$53	$43	$51	$93	$533
	2. Freddie	NA	NA	NA	NA	NA	$14	$19	$26	$28	$34	$34	$30	$24	$26	$24	$48	$307
	3. FHA	$30	$37	$43	$35	$52	$56	$64	$82	$79	$81	$82	$69	$48	$31	$27	$28	$647
	4. VA	$12	$8	$28	$22	$28	$24	$31	$38	$20	$24	$27	$32	$21	$16	$14	$13	$260
	B. % Fannie/Freddie/ FHA/VA acquisitions /insurance of HPL with High LTV loans are of Total HPL with High LTV	NA	NA	NA	NA	NA	64%	64%	79%	78%	69%	64%	66%	47%	43%	36%	50%	66%
Section E	C. Total tracked Subprime loans	*	*	*	*	*	$167	$284	$286	$231	$412	$505	$684	$748	$802	$774	$434	$5,327
	1. Fannie/Freddie	*	*	*	*	*	$40	$101	$92	$76	$175	$244	$344	$324	$308	$248	$257	$2,209
	2. FHA	*	*	$33	$19	$31	$45	$66	$82	$66	$93	$99	$112	$64	$38	$36	$48	$749
	D. % Fannie/Freddie/ FHA Subprime acquisitions/insured loans ($) are of total tracked Subprime loans						51%	59%	61%	61%	65%	68%	67%	52%	43%	37%	70%	56%
Section F	E. Total tracked Alt-A Lending	*	*	*	*	*	*	*	*	*	*	$133	$162	$254	$457	$557	$453	$2,016
	1. Fannie/Freddie total known Alt-A	*	*	*	*	*	*	*	*	*	*	$84	$89	$94	$103	$200	$193	$773
	2. Fannie/Freddie known Alt-A ($) as a % of total tracked Alt-A lending	*	*	*	*	*	*	*	*	*	*	63%	55%	37%	23%	36%	43%	38%

*Not available

Section D: Detail for High LTV Home Purchase Loans

As noted earlier, tracking the full volume of Self-denominated Alt-A and Alt-A by Characteristic loans over the entire 1992-2007 period presents challenges. This Section D presents comprehensive data on High LTV Home Purchase loans, a type of Alt-A by Characteristic loan going all the way back to 1992. This category grew rapidly starting in the mid-1990s as a result of the federal policies described earlier.

In 1992 the percentage of Home Purchase Loans with an LTV >90% was 24%. During the period 1994-2000 it averaged 36.5%, an increase of over 50%. Adjusting the 2001-2007 originations for the increasing use of combination 1st and 2nd loans results in the entire 1994-2007 period averaging about 36% of Home Purchase Loans with an LTV/CLTV >90%.[185] During the entire 1994-2007 period Fannie, Freddie, FHA, and VA were responsible for 66% of all high LTV home purchase loans.

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[185] Starting in about 2001, combination 1st and 2nd loans were much more prevalent with respect to home purchase financings. For example, Fannie reported that by the end of 2007 combination loans with a combined LTV>90% would have added an additional 50% to its total of loans with an LTV>90% (Fannie Mae 2007 10-K, p. 128). Freddie had a similar experience. It would have added an additional 75% to its total of loans with an LTV>90% (Freddie Mac Quarter 2 10-Q, p. 60). The percentages in this table do not reflect this impact

Table 2: Detail for High LTV Home Purchase Loans - see endnotes for sources

$ in billions[i]	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	*Total for years. under-lined*
1. Total $ of Home Purchase Loans (HPL)	$369	$375	$458	$429	$460	*$475*	*$595*	*$615*	*$588*	*$917*	*$1,064*	*$1,106*	*$1,409*	*$1,545*	*$1,520*	*$1,168*	*$11,002*
3. % of HPL with High LTV (>90% LTV) [ii]	24%	27%	35%	36%	38%	37%	37%	38%	35%	30%	29%	27%	22%	18%	21%	31%	
4. $ of HPL with High LTV (>90% LTV)	$87	$100	$159	$156	$173	*$176*	*$218*	*$231*	*$205*	*$273*	*$307*	*$300*	*$308*	*$271*	*$321*	*$366*	*$2,976*
5. Fannie/Freddie/ FHA/VA HPL with High LTV as a % of total HPL with High LTV	NA	NA	NA	NA	NA	64%	64%	79%	78%	69%	64%	66%	47%	43%	36%	50%	
4. % of Conventional HPL with >90% LTV	14%	17%	25%	27%	25%	25%	25%	23%	22%	21%	21%	20%	18%	15%	19%	29%	
5. $ of Conventional HPL with >90% LTV	$45	$55	$88	$99	$93	*$96*	*$123*	*$111*	*$106*	*$168*	*$198*	*$199*	*$239*	*$224*	*$280*	*$325*	*$2,069*
6. % of Fannie HPL with >90% LTV	15%	25%	22%	27%	23%	26%	26%	26%	23%	25%	24%	25%	23%	23%	26%	35%	
7. % of Fannie HPL with >95% LTV	0%	0%	NA	NA	NA	3%	4%	4%	4%	7%	8%	12%	13%	15%	19%	26%	
8. $ of Fannie HPL with >90% LTV	NA	NA	NA	NA	NA	*$18*	*$25*	*$36*	*$33*	*$50*	*$53*	*$68*	*$53*	*$43*	*$51*	*$93*	*$533*
9. % of Freddie HPL with >90% LTV	13%	16%	12%	20%	22%	23%	30%	27%	26%	26%	26%	27%	19%	16%	16%	29%	
10. % of Freddie HPL with >95% LTV	0%	0%	NA	NA	NA	1%	3%	5%	6%	5%	8%	10%	6%	8%	10%	19%	
11. $ of Freddie HPL with >90% LTV	NA	NA	NA	NA	NA	*$14*	*$19*	*$26*	*$28*	*$34*	*$34*	*$30*	*$24*	*$26*	*$24*	*$48*	*$307*
12. % of FHA HPL with >90% LTV	82%	83%	85%	86%	86%	85%	87%	88%	91%	89%	88%	85%	85%	85%	84%	81%	
13. % of FHA HPL with >95% LTV	53%	58%	60%	62%	61%	61%	68%	74%	85%	83%	81%	78%	78%	78%	70%	60%	
14. % of FHA HPL with >=97% LTV	14%	25%	27%	28%	26%	24%	23%	44%	52%	57%	57%	54%	54%	56%	49%	42%	
15. $ of FHA HPL with >90% LTV	$30	$37	$43	$35	$52	*$56*	*$64*	*$82*	*$79*	*$81*	*$82*	*$69*	*$48*	*$31*	*$27*	*$28*	*$647*
16. $ of VA HPL with >90% LTV (all assumed >90% LTV)	$12	$8	$28	$22	$28	*$24*	*$31*	*$38*	*$20*	*$24*	*$27*	*$32*	*$21*	*$16*	*$14*	*$13*	*$260*

Section E: Detail for Subprime Loans (Note: not all loans with FICO<660 are tracked on this chart)

Subprime Loans as a percentage of total originations were fairly constant for the period 1997-2003, averaging about 19.5%. The percentage averaged 26% for 2004-2006, before declining to 18% in 2007. Fannie, Freddie and FHA accounted for 49% of tracked Subprime Loan volume in 1997, the first year for which comprehensive data is available. They averaged 55.5% of tracked Subprime Loan dollar volume for 1999-2003. This dropped to 24% for 2004-2006, before returning to 56% in 2007. Over the entire period of 1997-2007, Fannie, Freddie, and FHA averaged 55% of the total tracked Subprime Loan dollar volume. As the average loans sizes of Fannie, Freddie, and FHA subprime loans were smaller that the remaining subprime loans, Fannie, Freddie, and FHA acquired about 63% of all tracked subprime loan over the 1997-2007 period.[186]

[186] Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30, Freddie Mac 2008 Second Quarter Financial Results p. 26, and NY Fed subprime database at http://www.newyorkfed.org/regional/techappendix_spreadsheets.html#sub_loans

Table 3: Detail for Subprime Loans - see endnotes for sources

$ in billions[iii]	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	***Total for years under-lined***
1.Total of all originations	**$894**	**$1020**	**$773**	**$639**	**$785**	***$860***	***$1,450***	***$1,310***	***$1,048***	***$2,215***	***$2,885***	***$3,945***	***$2,920***	***$3,120***	***$2,980***	***$2,430***	***$25,163***
2. Total $ of tracked Subprime Loans	*	*	*	*	*	***$167***	***$284***	***$286***	***$231***	***$412***	***$505***	***$684***	***$748***	***$802***	***$774***	***$434***	***$5,327***
3. Total tracked Subprime $ as a percentage of total originations	*	*	*	*	*	***19%***	***20%***	***22%***	***22%***	***19%***	***18%***	***17%***	***26%***	***26%***	***26%***	***18%***	***21%***
4Fannie/Freddie/ FHA Subprime as a % of total tracked Subprime	*	*	*	*	*	***51%***	***59%***	***61%***	***61%***	***65%***	***68%***	***67%***	***52%***	***43%***	***37%***	***70%***	***55%***
5. $ of Self-denominated Sub-prime Loans	**$80**	**$85**	**$75**	**$60**	**$70**	***$85***	***$135***	***$130***	***$100***	***$160***	***$200***	***$310***	***$540***	***$625***	***$600***	***$191***	***$3116***
6. $ of Private MBS (includes portion acquired by Fannie/Freddie)	*	*	*	**$18**	**$38**	***$66***	***$83***	***$60***	***$56***	***$94***	***$134***	***$203***	***$401***	***$508***	***$483***	***$219***	***$2307***
7. $ of Private MBS acquired by Fannie/Freddie	*	*	*	*	*	***$3***	***$18***	***$18***	***$11***	***$16***	***$38***	***$82***	***$180***	***$169***	***$110***	***$62***	***$707***
8. Total $ of Fannie, Freddie, & FHA Subprime by FICO	*	*	*	*	*	***$82***	***$149***	***$156***	***$131***	***$252***	***$305***	***$374***	***$208***	***$177***	***$174***	***$243***	***$2252***
9. $ acquired by Fannie	*	*	*	*	*	***$21***	***$46***	***$41***	***$41***	***$102***	***$137***	***$185***	***$94***	***$86***	***$89***	***$127***	***$969***
10 $ acquired by Freddie	*	*	*	*	*	***$16***	***$37***	***$33***	***$24***	***$57***	***$69***	***$77***	***$50***	***$53***	***$49***	***$68***	***$533***
11. $ acquired by FHA	*	*	**$33**	**$19**	**$31**	***$45***	***$66***	***$82***	***$66***	***$93***	***$99***	***$112***	***$64***	***$38***	***$36***	***$48***	***$749***

* Unknown

Section F: Detail for Self-denominated Alt-A Loans

Self-denominated Alt-A Loans had low volumes for the period 1992-2001, accounting for 3% or less of total originations.   Once Fannie and Freddie became active Alt-A purchasers in 2002, Alt-A market share expanded tremendously over the next 6 years. Since the average loans size of Fannie and Freddie's Alt-A loans was a little more that ½ of the Alt-A loans they did not buy, they accounted for 53% of all self-denominated Alt-A acquisitions

Table 4: Detail for Self-denominated Alt-A Loans - see endnotes for sources

$ in billions[iv]	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	***Total for years under-lined***
1.Total of all originations	**$894**	**$1020**	**$773**	**$639**	**$785**	**$860**	**$1,450**	**$1,310**	**$1,048**	**$2,215**	***$2,885***	***$3,945***	***$2,920***	***$3,120***	***$2,980***	***$2,430***	***$18,280***
2. $ of total Self-denominated (SD) Alt-A as a % of $ of total originations	**1%**	**1%**	**1%**	**1%**	**3%**	**3%**	**2%**	**3%**	**2%**	**2%**	***5%***	***4%***	***9%***	***15%***	***19%***	***19%***	***11%***
3.$ of Fannie/Freddie (F/F) SD Alt-A as a % of total $ of SD Alt-A	*	*	*	*	*	*	*	*	*	*	***63%***	***55%***	***37%***	***25%***	***36%***	***43%***	***38%***
4.# of F/F SD Alt-A as a % of total # of SD Alt-A $173,000 F/F average loan balance & $310,000 balance for other Alt-A)	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	Unk.	***53%***
5.Total $ of SD Alt-A (#6 + #9)	**$9**	**$11**	**$10**	**$10**	**$20**	**$25**	**$35**	**$40**	**$25**	**$40**	***$133***	***$162***	***$254***	***$457***	***$557***	***$453***	***$2,016***
6. Total $ of Inside Mortgage Finance SD Alt-A Loans	**$9**	**$11**	**$10**	**$10**	**$20**	**$25**	**$35**	**$40**	**$25**	**$40**	***$67***	***$85***	***$190***	***$380***	***$400***	***$275***	***$1397***
7. $ of Private MBS (includes portion acquired by F/F	*	*	*	**<$1**	**$1**	**$4**	**$18**	**$15**	**$14**	**$36**	***$53***	***$74***	***$159***	***$332***	***$366***	***$250***	***$1234***
8. $ of Private MBS acquired by F/F	*	*	*	*	*	*	*	*	*	*	***$18***	***$12***	***$30***	***$36***	***$43***	***$15***	***$154***
9. $ of SD Alt-A acquired by F/F (not part of #5).	**	**	**	**	**	**	**	**	**	**$15*****	***$66***	***$77***	***$64***	***$77***	***$157***	***$178***	***$619***

Unk. = unknown

* Volume believed to be either $0 or minor.

**Fannie and Freddie used their various affordable housing programs and individual lender variance programs (many times in conjunction with their automated underwriting systems once these came into general use in the late-1990s) to approve loans with Alt-A characteristics, however they generally did not classify these loans as Alt-A. This started in the early-1990s. Many of the loans had higher debt ratios, reduced reserves, loosened credit requirements, expanded seller contributions, etc.

***Fannie only.

[i] Sources:
1. Total Home Purchase Loans: IMF Volume 1, p. 4
4. % of Conventional Home Purchase Loans >90% - Federal Housing Finance Board
5., 12, 13, 14, 15, & 16: $ of Conventional Home Purchase Loans >90% - #1. minus FHA and VA Home Purchase Lending (FHA HPL from FHA 2009 Actuarial Report and HUD PDR Historical Data). VA HPL calculated based on FHA percentages. FHA and VA total volume from FHFA (OFHEO).
6, 7, 8, 9, 10, & 11: HUD PDR reports – Profiles of GSE Mortgage Purchases. These are new calculations based on a new, more accurate data source. Earlier editions of this exhibit contained data that was based on estimates using OFHEO data.
[ii] High LTV Home Purchased Lending does not include High Combined LTV Home Purchase lending. This type of lending became much more prevalent starting in 2001. As noted above, Fannie and Freddie report that their volume of High LTV loans would have increased by 50% (Fannie) and 75% (Freddie) if loans with Combined LTVs above 90% were included.
[iii] Sources:
1. Inside Mortgage Finance
5. Inside Mortgage Finance
6. Inside Mortgage Finance
7. OFHEO's "Mortgage Markets and the Enterprises" annual reports. Actual purchases for years 2002-2007. Estimates for years 1997-2001 based on Fannie and Freddie total purchases of PMBS for those years multiplied by 57% which is the percentage that subprime PMBS purchases constituted of their total PMBS acquisitions in 2002.
9. Fannie Information Statements for 2000-2007. At 12.31.2000 14% of Fannie's book had a FICO of <660. For 2000 acquisitions the percentage was 18%. Based on this data, the percentage of loans acquired with a FICO< 660 for the years 1997-1999 are estimated to have averaged 13%.
10. Freddie Information Statements for 2001-2007. At 12.31.2001 14% of Freddie's book had a FICO of <660. For 2001 acquisitions the percentage was 14%. Based on this data, the percentage of loans acquired with a FICO< 660 for the years 1997-2000 are estimated to have averaged 13%.
11. FHA 2009 Actuarial Report. Note: FICOs for 1994-2004 are based on samples.
[iv] Sources:
1. Inside Mortgage Finance
4. Fannie Mae 2008 Q. 2 10-Q Investor Summary p. 30, Freddie Mac 2008 Second Quarter Financial Results p. 26, and NY Fed Alt-A database found at http://data.newyorkfed.org/creditconditions/. Average loan balance of $300,000 found at New York Fed site adjusted upwards to $310,000
6. Inside Mortgage Finance
7. Alt-A PMBS issuances (also included in Alt-A originations 4. above) Inside Mortgage Finance. 1995-1996 volumes based on UBS data - BIS Quarterly Review. March 2006
8. OFHEO's "Mortgage Markets and the Enterprises" annual reports.
9. OFHEO's "Mortgage Markets and the Enterprises" annual reports and Fannie and Freddie Information Statements and Annual Reports