

Memorandum

Sizing Total Exposure to Subprime and Alt-A Loans in U.S. First Mortgage Market as of 6.30.08

Edward Pinto
Consultant to mortgage-finance industry
and chief credit officer at Fannie Mae in the 1980s

This memorandum 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

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, 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.¹ This had the effect of reducing its subprime loan count to a very small number. On the other hand, 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), which excluded the very large number of CRA loans that did not carry interest rates that fell into the HOPA category. The result was again a very small number of subprime loans defined as made under CRA. In this memorandum, I use the objective risk characteristics of the loan to determine whether it should be considered subprime or Alt-A. The definitions follow:

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.”² 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:

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.

¹ 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

² See Appendix 1

Not Initially Classified as Subprime or Subprime by Characteristic: 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."³ In 2001 federal 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)."⁴

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.⁵ 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).⁶ Fannie's SD rate on its traditionally underwritten loans (those loans without any of these high risk characteristics) is 1.78%.⁷ 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:

1. Lender delivering loan initially classified it as Alt-A based on documentation or other features, or
2. 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:

1. 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;
2. High Original LTV including 97% Original LTV and 100% Original LTV loans, along with 95% Original LTV loans with non-traditional underwriting guidelines and

³ S&P Structured Finance Ratings, January 1997, p. 14

⁴ See Appendix 1.

⁵ 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

⁶ Fannie Mae 2009 Third Quarter Credit Supplement, p. 5

⁷ Id. Derived from data found on p.5

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

3. 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, 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 <660⁸. FHA is projecting a 21% and 24% claims rate⁹ 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.

⁸ Data in or derived from 2009 Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund, pp. 42 and 44

⁹ 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: Summary of overall market exposure to subprime and Alt-A loans

Based on 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:

Section with detail*	Subprime and Alt-A Loans	Gross \$ in trillions	Net \$ in trillions	Net number of loans in millions (net of any overlap) ¹⁰
	Subprime	\$2.510	\$2.510	15.50
C. 1.	Self-denominated	\$1.190	\$1.190	6.7
C. 2.	Subprime by Characteristic	\$1.320	\$1.320	8.8
	Alt-A	\$3.035	\$2.212	11.169
D. 1.	Self-denominated Alt-A Private MBS	\$0.800	\$0.640	2.14
D.2.	Fannie Alt-A of all types	\$0.953	\$0.617	3.734
D. 2.	Freddie Alt-A of all types	\$0.622	\$0.395	2.575
D. 3.	FHA/VA Alt-A	\$0.160	\$0.160	1.390
D. 4.	Other conventional Alt-A	\$0.500	\$0.400	1.330
	Total	\$5.545	\$4.622	26.70

*Within each section, the text setting out the concluded gross and net dollar amounts and net number of loans for each loan type is bolded.

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).¹¹ 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.¹² The Federal Reserve reports that the dollar amount of outstanding first lien mortgages at 6.30.08 was \$9.42 trillion.¹³

¹⁰ 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.

¹¹ National Delinquency Survey, Mortgage Bankers Association, Q208

¹² 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.

¹³ Fed Flow of Funds report, Chart L.218, Line 2, Household sector home mortgage liabilities
<http://www.federalreserve.gov/releases/z1/Current/z1.pdf>

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 memorandum, 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. 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.¹⁴ The data in this memorandum 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 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:

“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.”¹⁵

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

¹⁴ NY Fed subprime database found at <http://data.newyorkfed.org/creditconditions/>

¹⁵ http://www.newyorkfed.org/regional/techappendix_spreadsheets.html#sub_loans

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 \$178,000.¹⁶ 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 issuances¹⁷. This percentage was then applied to the 6.5 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 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.¹⁸ All Fannie and Freddie loans (regardless of FICO or other loan characteristics) are reported into the LP Prime Database only.¹⁹ The LP Prime Database was set up in 1989

¹⁶ NY Fed subprime database found at <http://data.newyorkfed.org/creditconditions/>

¹⁷ Inside Mortgage Finance “The 2009 Mortgage Market Statistical Annual” pages 3 and 4.

¹⁸ This was confirmed in a conversation with Dan Feshbach founder of Loan Performance Corp.

¹⁹ Id.

before the use of FICO, 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.²⁰

- 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.²¹

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.²² **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 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.²³ The data in this memorandum 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.”

²⁰ 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.

²¹ 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.ghb.co.th/en/Journal/Vol2/05.pdf>.

²² Fannie and Freddie account for 4.554 million loans with a FICO <660. 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). FHGA’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>.

²³ NY Fed Alt-A database found at <http://data.newyorkfed.org/creditconditions/>

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. The net 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%.²⁴ **The 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 Memorandum.

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

²⁴ 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/>

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 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.²⁵ The product feature of Combined LTV >90% is the exception; however it was disclosed separately in Fannie's 2007 10-K²⁶ and Freddie's 2008 Quarter 2 10-Q.²⁷

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%).²⁸ 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.²⁹ 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 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.³⁰ 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.³¹ This results in the remaining 4 product features (negatively amortizing loans, interest-only loans, loans with an Original LTV >90%, and

²⁵ Fannie Mae 2009 Second Quarter Credit Supplement, p. 5.

²⁶ Fannie Mae 2007 10-K, p. 128.

²⁷ Freddie Mac Quarter 2 10-Q, p. 60.

²⁸ 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.

²⁹ Fannie Mae 2009 Q. 2 10-Q Investor Summary p. 5.

³⁰ 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.

³¹ Appendix 2

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:³²

“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%.³³ The overlap between this product characteristic and the six that have already been addressed is estimated at 70%, yielding \$0.040 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 0.262 million loans.³⁴

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.³⁵ 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

³² Fannie Mae 2007 10-K, p. 128.

³³ 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.

³⁴ Fannie Mae 2009 Second Quarter Credit Supplement, p. 5.

³⁵ 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.

(FICO<619 and FICO of 620-659) total \$0.240 trillion.³⁶ 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:³⁷

“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%.³⁸ As a result, \$0.110 trillion of its portfolio at 6.30.08 consists of loans with a Combined LTV >90%.³⁹ 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 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.⁴⁰ 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 <660.⁴¹

³⁶ 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.

³⁷ Freddie Mac Quarter 2 10-Q, p. 60.

³⁸ Freddie Mac's Second Quarter 2008 Financial Results (slides from conference call) p. 26.

³⁹ The 6% difference times Freddie's \$1.837 trillion total single-family portfolio yields \$0.110 trillion before deduping.

⁴⁰ National Delinquency Survey, Mortgage Bankers Association, Q208

⁴¹ Data derived from 2009 Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund, pp. 42 and 44

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 \$103,300.⁴² 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 lending activity (not just their activity accounted for in this memorandum) totaled an additional \$4.504 trillion.⁴³ Government loans total approximately \$0.643 trillion in outstanding loans.⁴⁴ These non-overlapping categories account for \$7.137 trillion of the \$9.42 trillion in 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 and \$2 trillion as of 9.30.09.⁴⁵

As of 9.30.09 \$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 on the \$0.800 trillion first mortgage loans held by these five banks is about 12%. The average delinquency rate on the

⁴² Derived from the FHA Biweekly report for July 16-31, 2008 found at: <http://www.hud.gov/offices/hsg/comp/rpts/ooe/ol2009.pdf>

⁴³ 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

⁴⁴ See earlier data noting 5.39 million outstanding government loans with an average balance of \$115,000.

⁴⁵ 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

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%.⁴⁶

This poor level of performance provides *prima facie* evidence that half or more of the \$0.800 billion is 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.⁴⁷ Total loans acquired by Wells upon the purchase of Wachovia totaled \$0.160 trillion.⁴⁸
2. Bank of America purchased Countrywide and was expected to take \$33 billion in write offs.⁴⁹ When it acquired Countrywide it took on about \$0.050 trillion in loans.⁵⁰
3. JP Morgan Chase added about \$0.100 trillion in loans when it purchased Washington Mutual.⁵¹
4. Indy Mac had about \$0.011 trillion in loans when it failed. It specialized in Alt-A loans.⁵²
5. PNC was expected to take a \$20 billion write down on the loans it acquired as part of its acquisition of National City.⁵³ PNC added about \$0.015 trillion in loans when it purchased National City.⁵⁴

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).⁵⁵ Others are pay option ARMs and other types of Alt-A loans as noted in the above examples.

⁴⁶ <http://www.wmlab.com/top25.asp?ln=lnall>

⁴⁷ <http://www.reuters.com/article/idUSTRE50P6O420090126>

⁴⁸ <http://www.wmlab.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,

⁴⁹ <http://www.bloomberg.com/apps/news?pid=20601110&sid=arYakEWFRTtE>

⁵⁰ <http://www.wmlab.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.

⁵¹ <http://www.wmlab.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.

⁵² http://en.wikipedia.org/wiki/OneWest_Bank

⁵³ <http://www.reuters.com/article/idUSN2451279820081024>

⁵⁴ <http://www.wmlab.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.

⁵⁵ 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

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 \$0.400 trillion gross and net dollars of Alt-A loans. Assuming an average loan amount of \$300,000⁵⁶ 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 four 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 is relatively small (likely 10% or less) 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%.⁵⁷ For purposes of this memorandum, this remainder will be identified as an unidentifiable quantity of Alt-A by Characteristic.

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>.

⁵⁶ 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.

⁵⁷ 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 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: FICO<620 and FICO 620-659 held by Fannie and Freddie as of 6.30.08:

Type	Number of loans	\$ amount
Fannie		
<620 FICO ⁵⁸	1 million	\$0.127 trillion
620-659 FICO ⁵⁹	1.882 million	\$0.267 trillion
<i>Subtotal</i>	<i>2.882 million</i>	<i>\$0.394 trillion</i>
Freddie		
<620 FICO ⁶⁰	0.574 million	\$0.076 trillion
620-659 FICO ⁶¹	1.148 million	\$0.164 trillion
<i>Subtotal</i>	<i>1.722 million</i>	<i>\$0.240 trillion</i>
Total	4.544 million	\$0.634 trillion

⁵⁸ 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).

⁵⁹ 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.

⁶⁰ 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).

⁶¹ 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).