

Report On AD&Co's 20th Annual Conference

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Editor's Note

- Andrew Davidson & Co. (AD&Co), which develops credit models and risk measurement tools for the mortgage finance industry, held its 20th Annual Conference on June 13, 2012, at the City University of New York Graduate Center. Over 200 delegates attended the conference. In addition to AD&Co employees, speakers at the event included mortgage industry professionals from both the buy side and the sell side, as well as from academia and government.
- For the most part, the following summaries reflect my notes and recollections, and they have not been reviewed or approved by the speakers. I have tried to capture speakers' remarks accurately, and I apologize for any inaccuracies or omissions. In addition, I wish to acknowledge the excellent work of AD&Co in organizing and hosting the conference.

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Publication Date

Aug. 2, 2012

Innovation Amid Uncertainty

- An AD&Co speaker opened the conference by noting that the crisis in the mortgage market is five years old, and it's clear now that there is no going back to the way things were. Some things are the same, but many have changed: Uncertainties persist about the direction of home prices, interest rates, unemployment, and delinquencies, and the impact of loan modifications, loan repurchases, refinancings, and HARP 2.0 (see note 1) remains unclear.
- Going into the crisis, AD&Co had a healthy respect for modeling error and held the view that mortgage credit was weak, the speaker noted. Its LoanDynamicsModel (LDM) used a transition matrix approach and was not simply a life-of-loan loss model. Delinquencies and home prices were both important parts of the model. The latest release of LDM incorporates delinquencies in the analysis of prepayments on agency mortgage-backed securities (MBS) and has new home-price features, primary-secondary spread modeling, and expanded credit metrics for MBS and loans, including both OTTI (other-than-temporary impairment) and fair value analysis.

Mission Possible: Modeling Delinquencies In Agency Pools

- At last year's AD&Co conference, the speakers talked about separating voluntary prepayments from delinquency buyouts in agency pools, including the differences across vintages and borrower characteristics that influence delinquencies. AD&Co analyzed the number and definition of states to use in creating a state transition model for agency pools.
- Since last year, much more data about delinquencies has become available from Freddie Mac.
- An AD&Co speaker noted that the current LDM for agency pools is a three-state model: current (C), delinquent (D), and terminated (T). The repurchase transition (from D to T) differs by agency. Freddie Mac's current practice, which may change in the future, is to purchase all loans after they become 120 days delinquent. Ginnie Mae's current practice is to give an issuer the option to purchase a loan when it chooses, which produces lower D-to-T transition rates than for Freddie. The picture for Fannie Mae is unclear because the agency has not released delinquency data.
- AD&Co decided to use a three-state model rather than one with multiple delinquency states, which reduces noise and enhances consistency with the LDM's model for nonagency pools, but gives up the benefit of capturing differences of behavior by borrowers at different stages of delinquency. For instance, it doesn't fully capture "cycling" behavior (moving between different delinquency subcategories) and differences in cycling by borrowers of different credit quality. Interestingly, AD&Co's research shows that subprime borrowers cure early delinquencies more frequently than do prime-quality borrowers. So, once a loan becomes delinquent, it is more likely to default if the borrower had a high credit score (for example, a FICO score).
- Freddie Mac and Ginnie Mae provide pool-level, rather than loan-level, delinquency data. Accordingly, the state transition rates in the LDM agency model come from observed roll rates for nonagency pools. The process of building the model estimates the C-to-D and D-to-C transitions jointly and uses the delinquency percentage as the explanatory variable.
- A feature of the C-to-T transition (which reflects refinancing) in the LDM agency model is the use of a cumulative normal distribution function (which has an "S" shape) in creating the refinancing S-curve. The primary mortgage rate is the key factor. The AD&Co speaker noted that borrowers have become very savvy and aggressive about shopping for the best rate. Interestingly, since the onset of

the financial crisis, more borrowers have chosen 15-year loans, which reflects their increased sophistication when choosing mortgage products.

- The LDM agency model uses weighted-average pool inputs for the credit score, original loan size, and original loan-to-value (LTV) ratio.
- The speaker noted that an advantage of using a cumulative normal distribution function for constructing the refinancing S-curve is that it captures all the relevant variables within the model and eliminates the need to apply scaling factors in a second step. This promotes consistency.
- AD&Co plans to extend the current approach to create a pool-level version of LDM for nonagency pools. The final step will be to extend LDM to agency loans at the loan level.

Modeling Primary/Secondary Spreads (PSS)

- An AD&Co speaker noted that AD&Co's current LDM and prepayment models use secondary spreads and assume that primary spreads are 50 basis points (bps) higher. The problem is that secondary spreads have been more than 100 bps wider than primary rates. The primary-secondary spread is not simply the difference between the gross rate and the net rate because current coupon MBS may command premium prices (2 points of premium amounts to roughly 40 bps-50 bps of spread).
- The primary-secondary spread is wider when rates are lower. The spread is much less volatile than the rate index, the speaker noted. Trend is a factor (note: suggesting serial correlation). A partial explanation for the change in the spread is that the primary rate is expressed as a mortgage-equivalent yield (MEY), while the secondary rate is expressed as a bond-equivalent yield (BEY). Another explanatory factor is that the conversion in the Bloomberg system understates when the cheapest TBA security is at a premium and the yield curve is steep. A third factor is that primary rates become sticky (resisting further downward movement) when they are at low absolute levels.

Measuring Housing Affordability And Home Price Equilibrium

- An AD&Co speaker noted that while home prices are linked to interest rates, other factors also influence home prices. Economists' models of home prices include variables that MBS analytical systems, including AD&Co's models, don't consider.
- Modeling home prices presents a conundrum, the speaker said. On the one hand, rising interest rates should depress home prices. On the other hand, rising interest rates typically occur when the economy is improving, which should push home prices higher. Empirically, home prices and interest rates move in opposite directions some of the time, especially in the short run. However, the longer-term effect of high interest rates is to push home prices higher.
- A borrower's all-in cost of a mortgage loan is a combination of both the interest cost on the amount borrowed and the cost of the down payment (borrower's equity). Higher LTV ratios, in effect, operate like a reduction in loan interest rates, causing more refinancings and boosting the affordability of homes.
- AD&Co's research shows that from 2000 to 2004, the market priced the credit risk in prime, Alternative-A, and subprime mortgage loans fairly. However, starting in 2004, the market began to underprice the risk of Alt-A and subprime loans. The all-in cost of loans (including the equity cost) declined from 2000 to 2006 and then started rising again. Periods when option adjustable-rate mortgage loan originations are high tend to correspond with periods of rapidly rising home prices.

- AD&Co's "Affordability Index," which differs from that of the National Association of Realtors, is the ratio of borrowers' income to the product of all-in cost times HPI (indexed level of home prices).
- Declining down payments and the underpricing of credit risk underlie the bubble-bust dynamic, the speaker noted. Knowledge of rates is necessary, but not sufficient, to understand the dynamic. Origination has recently shifted from Fannie Mae and Freddie Mac to Ginnie Mae because of the high LTV ratios allowed on FHA loans. The relative role of interest rates and credit mispricing is higher when the equity cost is lower. AD&Co will likely reduce the impact of interest rate changes on HPI in the next edition of its HPI model ("HPI3").

Back To The Future: Grading Credit Risk

- An AD&Co speaker opened the session by asking the audience to consider traveling back in time and purchasing the 1A1 tranche of Countrywide's CWALT 2006-33CB residential mortgage securitization (CUSIP 02148BAA2). The tranche started out with triple-A ratings (from Moody's and Fitch) and a bank regulatory capital charge of 1.6%. After the tranche was downgraded, the capital charge for an insurance company holding it would have increased. After a hypothetical resecuritization of the position, the capital charge could be restored. But then, after a hypothetical subsequent downgrade of the resecuritization, the capital charge would spike again.
- AD&Co suggests that capital charges should not be based on rating agency credit ratings, arguing that they place too much emphasis on the likelihood of default and not enough emphasis on recovery. AD&Co proposes its alternative ranking system, called CreditProfile Category (CPC), which is based on four factors: (i) breakpoint ratio, which captures the likelihood of default; (ii) effective thickness, which captures loss severity under different scenarios; (iii) average loss, which captures scenario-weighted credit losses; and (iv) effective shortfall, which captures weighted-average credit losses in extreme stress scenarios. CreditProfile uses 19 scenarios covering a base case, six improving scenarios, four "moderate stress" scenarios, four "stress" scenarios, and four "extreme stress" scenarios.
- AD&Co notes that in contrast to rating agency credit ratings, CreditProfile measures credit losses against a security's carrying value on an investor's books, rather than against the security's par value. For example, if a bond is booked at 58 (that is, a price of 58% of par), it can receive a much higher CPC than if it's carried at par. Using CreditProfile instead of rating agency credit ratings for capital charges could avoid the need to execute resecuritizations to manage regulatory capital charges, the speaker said. Compared to rating agency credit ratings, CreditProfile produces higher CPCs for securities with high likelihoods of default but low projected loss severities, while it produces lower CPCs for securities with low likelihoods of default but high projected loss severities. The effective thickness of a security is a key factor in explaining the difference between rating agency credit ratings and CPCs.
- AD&Co stated that it produces CPCs on roughly 33,000 tranches, and all the CPCs are based on loan-level data.

Model Validation: Framework & Example

- AD&Co noted that model validation helps to reduce model error, including usage error and reducible model errors (*i.e.*, errors in the specification of the model).

- AD&Co's validation framework has three pillars: (i) conceptual soundness, (ii) ongoing monitoring, and (iii) governance and change management. All of AD&Co's model validations follow that broad framework. AD&Co reconsiders the conceptual framework at each model update. It also holds quarterly formal model governance meetings and conducts monthly performance reporting.
- "Conceptual soundness" considers the choice of the overall structure of the model as well as the alternatives not chosen. What variable and functional forms did we choose, and why? What limitations might arise from the period of estimation? Do all the choices make sense in terms of the goals of the model?
- LDM is a credit model. The speaker noted that one alternative approach would be to model probability of default (PD) and loss given default (LGD) without a time component. However, such a model would not meet the goal of producing prepayment rate and default rate vectors to feed cash flow models. Likewise, pure CPR-CDR (constant prepayment rate and constant default rate) models would not explain important state changes. Conversely, a model with more states and state transitions than LDM would add complexity but not necessarily explanatory power or improved tracking.
- Likewise, choices for modeling state transitions can use various functional forms: logistic, other proportional hazard techniques, or scaled cumulative normal distribution functions. LDM uses logistic approaches for some transitions and the normal CDF for others. LDM uses a tobit model for loss severity.
- The original LDM calibration comes from precrisis data. Tuning factors draw from the crisis experience.
- AD&Co has decided to embrace a single underlying design philosophy for selecting variables and functional forms in its models. This should reduce inconsistencies arising from individual modelers' preferences.
- As part of ongoing monitoring, AD&Co found that the LDM was overpredicting C-to-D transitions of lower-quality loans. Possible explanations were an improving economy and credit burnout (the removal of the weakest borrowers from the overall pool through defaults). The solution could be tuning the model or adding a credit burnout feature. AD&Co noted that the model validation process shouldn't just be part of internal audit, but also part of risk management.
- AD&Co internally validates its models. Certain AD&Co customers need to validate the models for regulatory purposes and for their own risk management. Such customers may be able to use AD&Co's validation reports as part of their own validation process.

Theory And Practice Of Mortgage Securitization Reform

- An AD&Co speaker introduced this panel by noting that a mortgage is many things. It is documents in a loan file. It is processes for origination, disbursement, and servicing. It is a bundle of financial risk: interest-rate risk, prepayment risk, and credit risk. A mortgage is also the hopes and dreams of borrowers. Additionally, it is an instrument of economic policy.
- The financial risks of a mortgage include funding, interest-rate risk, prepayment risk, and credit risk, the speaker said. Credit risk includes both origination risk (Are you lending to the person you thought you were?) and systemic risk (Will the mortgage produce a loss if macro conditions deteriorate?). Funding risk is a \$10 trillion issue because there are about \$10 trillion of residential mortgage loans on U.S. homes. Annual originations amount to around \$1 trillion-\$2 trillion. The

credit risk for all the loans is about \$400 billion, assuming that losses under highly stressful conditions could be about 4% of the \$10 trillion total.

- Funding for mortgage loans comes primarily from (i) MBS issued or guaranteed by Ginnie Mae, Fannie Mae, or Freddie Mac, (ii) bank deposits, and (iii) Federal Home Loan Bank advances, the speaker said. Private-label MBS was formerly a source of funding, but that source has largely dried up in the aftermath of the crisis. Thus, all the funding today comes from either banks or government-guaranteed operations.
- The probability that losses will exceed 4% to 5% is only about 1% (see note 2). The base case loss expectation is around 25 bps. The government should take the risk that losses will exceed 4% to 5%, the speaker said. Coverage of the first 4% to 5% can come from unfunded guarantees or funded sources. The guarantee fee should be around 50 bps, as follows:

$$G_{\text{fee}} = EL + (R-r) * (ES - EL)$$

where:

- G_{fee} is the guarantee fee
- EL is expected loss
- ES is expected shortfall
- R is return on equity
- r is the risk-free rate
- An open question is whether the government should charge for capital. A government guarantee can improve pricing.
- Representations and warranties are like an MBS investor's put option, the speaker said. The option is most valuable once a loan has defaulted. The current system creates an incentive to accept bad loans because an investor has the ability to exercise the put option later, after a loan defaults. A better way might be to have the representations and warranties expire so that there is no motivation to defer the exercise of the option.
- Under either a private or a governmental approach to covering the risk of "catastrophic" loss on residential mortgage loans (that is, the risk that credit losses exceed 4% to 5%), it would be necessary to have the private sector participate to cover losses up to the "catastrophic" level, the speaker said.
- AD&Co favors an approach based on a cooperative or mutual structure where originators collectively retain the first-loss exposure.
- According to AD&Co, by 2016, private-label MBS may fund as much as 20% of U.S. residential mortgage loans.

Is A Government Guarantee Necessary?

- One panelist emphasized that underlying the choice of whether or not to have government-guaranteed MBS is the question of how to resolve competing goals. A government guarantee creates moral hazard and, potentially, bad risk-taking and weak underwriting. On the other hand, a guarantee increases homeownership, and entirely eliminating them may not be politically or socially feasible. The panelist considers alternatives such as changing (i) the price of the guarantee, (ii) the scope of the guarantee, (iii) the types of loans that can be guaranteed, and (iv) the credit (loss) participation of the originators. Those four policy "levers" can change the price and quantity of the government guarantee.

- A second panelist referred to the FHFA's strategic plan (see note 3), which dodges the question of whether the government guarantee is necessary. The real answer to the question of whether a government guarantee is necessary depends on the prioritization of the policy objectives. The problem is that there are competing objectives: promoting homeownership, protecting taxpayers, democratizing the availability of credit, etc.
- There is not enough money in the banking system to finance all the mortgage loans in the U.S., the panelist said. Securitization—both private-label and GSE/GNMA—is necessary to provide a major portion of the funding for mortgage loans. If there were no government guarantee, interest rates would be higher and credit availability would fall.
- A third panelist asserted that a government guarantee is not necessary. Today housing is heavily subsidized. Homeownership is subsidized, and rental housing also receives subsidies. Housing subsidies cause Americans to buy more house than they could otherwise afford, with larger lots, more bedrooms, and more bathrooms. Thirty years ago, an academic argued that GDP was 10% lower than it would otherwise be because the subsidies caused misallocation of productive resources to housing. Eliminating the subsidies for housing would help to improve economic output and growth. The panelist favors creating prepayment fees (not “penalties,” because the term is pejorative) to ameliorate the prepayment risk associated with 30-year mortgage loans. The panelist believes that private-label securitization is absolutely coming back and that pension funds and insurance companies are the natural buyers of 30-year mortgage loans. Mortgages will become more expensive, but that just means that they will be priced to reflect their real risks.
- The fourth panelist posed the question in terms of what role the government should have in the housing market. He argued that the policy goal should be to promote a stable market where risk is priced correctly. Stability for the housing market is important because volatility scares away potential homebuyers. The housing market should be “boring,” he said. Everyone—homeowners, lenders and others—should have skin in the game. The government should regulate underwriting standards. The panelist argued for standardization of mortgage products and underwriting standards, saying that it would help to keep the mortgage market stable.
- The third panelist stated that the FHA should have a role in promoting homeownership by helping first-time buyers from the low- and moderate-income segments. He advocates grants to fund down payments rather than guarantees and noted that the government should also establish underwriting standards and capital requirements for banks.
- The second panelist reiterated that there should be a government guarantee but that it should be priced correctly. It has been consistently underpriced, the panelist noted, and guarantee fees should be much higher than they have been. The U.S. mortgage market is the “eighth wonder of the world” because of the underpricing of the government wrap. Overpricing the wrap would be better than underpricing it. The panelist asserted that traditional “rates investors” (investors who are willing to take interest-rate risk but not credit risk) would need substantially more than 50 bps of incentive to be willing to take on credit risk for residential mortgages.
- The first panelist attacked the high loan limits for FHA loans, which exceed the limit for Fannie Mae and Freddie Mac loans in high-cost areas. He suggests that there should be a schedule for reducing both the FHA loan limits and the Fannie Mae/Freddie Mac loan limits over time.
- The first panelist favors a substantial degree of standardization, but he would not merge Fannie Mae and Freddie Mac. The second panelist asserted that Fannie Mae and Freddie Mac have flawed

models because they have conflicting goals and obligations (that is, to both shareholders and taxpayers). The FHFA is exploring the idea of merging the two entities. The market already makes a pricing distinction between Fannie Mae and Freddie Mac. The big question for the AD&Co proposal for selling-off first-loss credit exposure is how the exposure would be priced. The second panelist expects that the pricing of the first-loss piece would be subsidized. The third panelist argued that the mortgage market is too fragile to absorb unnecessary change, such as combining Fannie Mae and Freddie Mac.

- The fourth panelist emphasized the importance of the government wrap to foreign investors and the benefits of liquidity in the TBA market. The third panelist reasserted the argument for implementing prepayment fees, while the fourth replied that the issue of whether prepayment fees would be beneficial boils down to pricing. The second panelist argued that foreign investors would likely be unwilling to accept unwrapped credit risk on U.S. residential mortgage loans, and also challenged the removal of the government wrap on the basis that it would produce too large a decline in U.S. household net worth.
- The third panelist observed that the popping of the dot-com bubble cost \$7 trillion. The loss of home values from the bursting of the housing bubble is about \$7 trillion, of which only about a trillion has “slopped over” to the financial sector. The dot-com bubble did not cause as much trouble because it was borne by households, which were not levered. In the current crisis, the \$1 trillion that has slopped over to the financial sector has caused mayhem because of the high leverage of financial institutions.

Innovative Thinking For Housing Finance

- One panelist explained that the FHFA’s strategic plan has three elements: i) Build a new infrastructure for the secondary mortgage market; ii) Reduce the GSEs’ dominant presence in the secondary mortgage market; and iii) Maintain foreclosure prevention and credit availability for new and refinanced mortgages (see note 3).
- To the first point, the panelist asserted that a new securitization platform is necessary to connect sources of funding to loan originators. Another aspect of building a new infrastructure is standardization of the systems between Fannie Mae and Freddie Mac. There should be a standardized pooling and servicing agreement that includes transparent servicing requirements and compensation. FHFA has brought the GSEs’ treatment of delinquent loans together. Investors want loan-level data, and the new plan should include providing this. Also, there should be an electronic system for document custody and recordkeeping. Broadly, the system should operate as a form of “utility.” One vision for a utility framework would be to have the utility implement standardization and leave pricing of risk to investors. An intermediate vision would be to have the utility enforce or police representations and warranties. The other end of the spectrum would be a government wrap.
- A second panelist suggested that there should be a robust system for mortgage finance even during periods of market stress, reducing the government’s involvement or subsidization. The overarching design principles include (i) keeping what works in terms of standardization for core mortgage products, and (ii) skin in the game for originators and securitizers. The panelist asserted that there should be a relatively small number of players, in order to achieve economies of scale. The framework should align public and private incentives by restricting entity (see note 4) activities, regulating governance, and eliminating the conflicting incentives by making any subsidies transparent

and on-balance-sheet. The panelist noted that the political reality is that the government will always end up bearing the extreme, tail risk, and said that entities should not have explicit affordable-housing goals.

- The panelist proposed a lender-owned cooperative with one business: securitizing mortgage loans. The utility/cooperative would insure credit risk in MBS issues. It would be mutually owned by the lenders, who would share losses in proportion to their level of securitization activities. Governance would be strict and regulated. Individual members would bear the risk of breaches of representations and warranties on their own loans. The members would mutualize and share other credit losses on a vintage-by-vintage basis as joint obligations. The government would bear losses above a specified detachment point (“catastrophic” losses).
- The panelist suggested that the guarantee fee for a coöp would depend on the capital level (probably in the range of 6% to 8%) and the assumed return on the members’ equity. Assuming tail losses of 6% occur every 20 to 50 years would imply a guarantee fee in the range of roughly 50 bps to 109 bps. Selling off a portion of the first-loss exposure could reduce the guarantee fee and produce the benefit of generating market pricing information about the first-loss risk.
- A third panelist highlighted that private-label RMBS issuance is happening, noting the five Redwood Trust (Sequoia Mortgage Trust) securitizations, amounting to \$1.65 billion. The deals have a new feature for handling breaches of representations and warranties, including an arbitration mechanism for claims of breaches, the panelist said. They also have far more extensive disclosure about exceptions to underwriting guidelines. The loans in the deals have very high weighted-average balances to borrowers with very high weighted-average credit scores. The borrowers’ debt-to-income ratios are around 30%, and the pools have high California concentrations.
- The panelist stated that many banks are reluctant to resume securitizations because of concerns about litigation risk. They are also discouraged from doing securitizations because of regulatory uncertainty, particularly related to risk retention. A third factor that discourages banks from securitization is the potential that they might be forced to use a credit rating agency that they did not select because of the “Franken Amendment” to the Dodd-Frank Act (Section 939F). Unless the SEC decides otherwise, the Franken Amendment would require the establishment of a board that selects one credit rating agency for each securitization (though an issuer could use other credit rating agencies in addition to the one the board selects). A fourth factor is the potential for more onerous disclosure requirements from the SEC when it eventually updates Regulation AB, the panelist noted. Separately, investors are concerned about government payments for loan modifications that potentially distort a servicer’s assessment of whether a proposed modification would be “NPV positive” (that is, produce higher proceeds than foreclosure of the loan). Investors are also concerned about the treatment of second liens because, in many cases, a first-lien mortgage bears the full brunt of a modification. Trustees have been notably absent from acting on behalf of investors, the panelist said, and when they do, there is often litigation against issuers.

GSE Risk Sharing

- One panelist remarked that an alternative for risk sharing is senior-subordinate structures. The problem is that the securities based on the senior tranches would not be like regular TBA MBS. A second alternative is synthetic risk transfers (note: like Freddie Mac’s Mortgage Default Recourse Notes, or “MODRNs”). A third alternative is private insurance.

- Another panelist observed that the government holds virtually all the credit risk on newly originated mortgage loans. The panelist asserted that investors cannot gain access to that risk as a way to generate returns and that they would have a very large appetite for U.S. residential mortgage risk if it were available. However, an issue for the mortgage market is attracting real-money investors who will not bounce in and out of the sector as market conditions change. “Hot money” is less useful for originators, who want sources of capital to be stable, the panelist said.
- Another panelist asserted that whatever system for risk sharing ultimately dominates, it should be used systematically to continually generate market pricing of the risk and to allow for improvement through evolution. It can produce a feedback mechanism for setting guarantee fees at a level that reflects the real risk.
- One panelist stated that the existing GSE regime for representations and warranties is acceptable and does not need to be changed. Another argued that it would be better to have representations and warranties expire. The first panelist countered that some representations and warranties need to survive for the life of a loan, while it could be acceptable for others to expire with the passage of time: The treatment of modifications needs to be spelled out to provide certainty to investors.
- Another panelist reiterated the point that it would be important to have real-money, long-term investors hold the credit-risk pieces of any risk-sharing arrangement. Hot money could produce untimely spread widening if many hot-money investors decide to sell at the same time. Purely technical factors and secondary market conditions for the credit-risk instruments could create price volatility. On the other hand, the panelist noted, there has to be some secondary market for the credit risk exposures to provide liquidity and continual market feedback. However, even with real-money, long-term investors, the onset of a housing crisis could precipitate a general repricing of credit risk that could make new loans more expensive.
- Before the crisis, the mortgage market ran with almost no equity capital. The need to bring in roughly \$400 billion-\$500 billion of capital to cover credit risk is a huge change. It presents a big opportunity, whatever the structure of risk sharing ultimately turns out to be. It should not be all hot money.

Notes

1) Federal Housing Finance Agency, FHFA, “Fannie Mae and Freddie Mac Announce HARP Changes to Reach More Borrowers,” press release (Oct. 24, 2011)

http://www.fhfa.gov/webfiles/22721/HARP_release_102411_Final.pdf.

2) By comparison, Standard & Poor’s criteria for U.S. residential mortgage-backed securities calls for credit enhancement of 7.5% on the benchmark prime-quality pool. See Parisi, F., Gillis, T., Mason, S., Cao, B., & Wang, J., “,” Standard & Poor’s criteria article (Sept. 10, 2009).

3) Federal Housing Finance Agency, “FHFA Sends Congress Strategic Plan for Fannie Mae and Freddie Mac Conservatorships,” press release (Feb. 21, 2012).

<http://www.fhfa.gov/webfiles/23344/StrategicPlanConservatorshipsFINAL.pdf>.

4) The term “entity” refers to the future Fannie Mae and Freddie Mac, or to a successor organization or organizations, whether it/they are government entities or private companies.

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