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# THE CAUSE OF A Crisis

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## AN IN-DEPTH LOOK at the root causes of the subprime mortgage crisis and ways actuaries can eliminate the problems.

Insurance companies have traditionally emphasized prudent liability risk analysis as their primary success factor. Yet failures on the asset side of balance sheets have accounted for the majority of the damage to the financial positions of insurers. The serious and widespread crisis in securities backed by subprime mortgages, and related problems in other residential and commercial mortgages, collateralized debt obligations, and so on should make it clear to insurance organizations, the American Council of Life Insurers (ACLI), the National Association of Insurance Commissioners (NAIC), the Society of Actuaries (SOA) and the American Academy of Actuaries (the Academy), that the manner by which investment risk is measured and managed must change, for the good of insurance companies, and the national economy.

The fact that the NAIC has hired a third party to help value residential mortgage backed securities (RMBS) is an indication that the insurance industry has not developed this expertise despite committing trillions of dollars to this investment. A large part of the difficulty with RMBS is the fact that investors do not have access to the basic investment asset—the individual residential mortgage. This would be analogous to insuring a portfolio of risks only knowing the average risk factors, and having no mechanism to audit the performance of the individual risks.

Having spent the better part of the last four years in the subprime mortgage industry, I analyze below what I see as the root causes of the subprime mortgage crisis, and offer a risk assessment approach specifically focused on

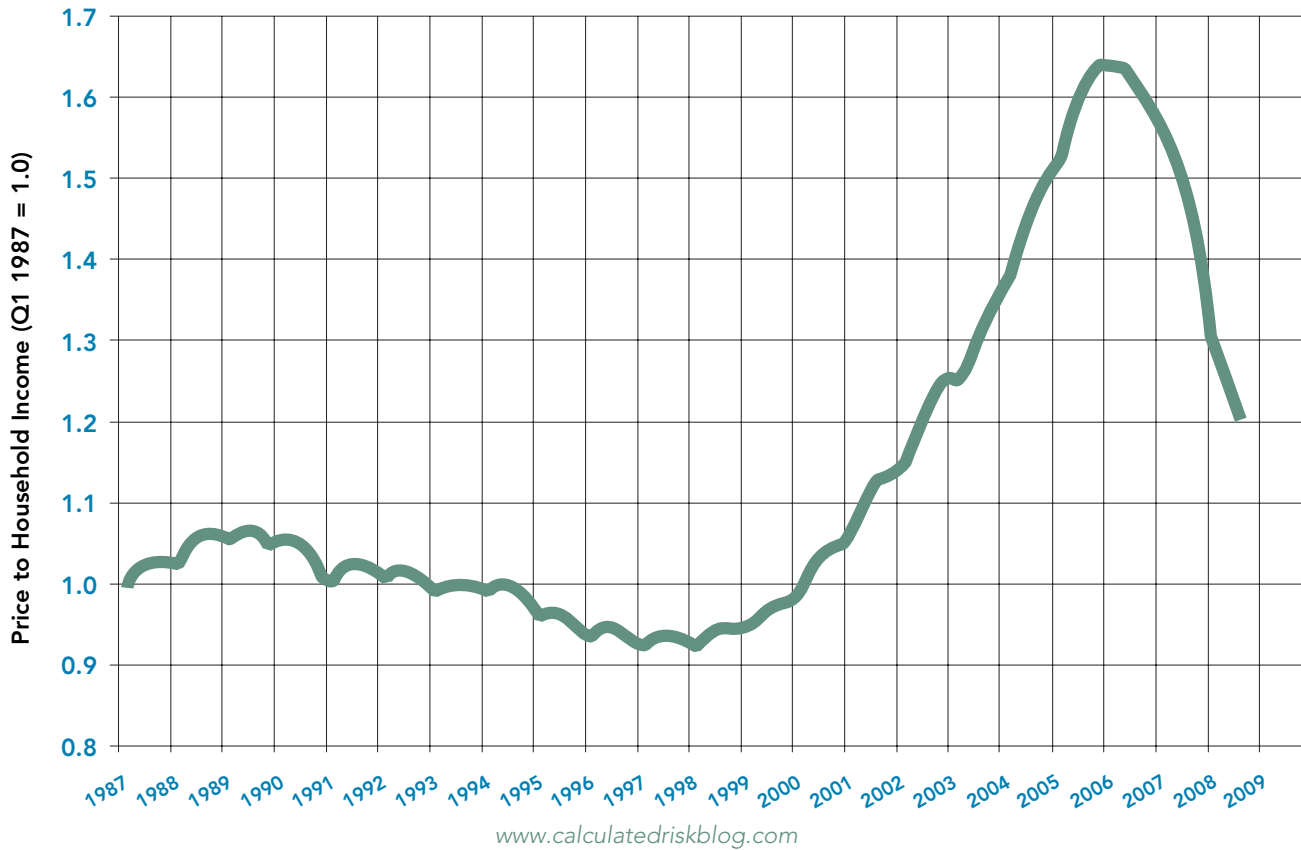
subprime mortgages, in response to the SOA's Request for Proposals (RFP). I also encourage the actuarial profession to lead the development of new investment risk assessment and valuation methodologies based upon transparency, observation, knowledge and experience, and recommend that this be started now.

### PERSPECTIVES

#### ROOT CAUSES OF THE SUBPRIME MORTGAGE CRISIS

In insurance parlance, subprime mortgages would be more accurately described as impaired mortgages. In its RFP, the SOA accurately recognized that subprime borrowers are impaired to the extent that they could not qualify for prime or conforming mortgages under the same terms as subprime mortgages. Suffice to say that a very large

# Price to Household Income (Q1 1987 = 1.0)



driver of the financial crisis was the vast expansion of impaired mortgages.

While home prices played a central role, it was the widespread ignorance of the risks associated with the impaired mortgages, unsustainable home price appreciation and codependent risks that laid the groundwork for the crisis. The frequently published graph (above), reflecting the relationship between average housing prices and average household income, clearly indicates that the rise in the housing index could not be sustained indefinitely. The precipitous decline beginning in 2006 confirms that this was indeed the case.

Home price appreciation was first fueled by a historic drop in prime interest rates in response to the economic slowdown immediately following 9-11. Low interest rates by themselves may not have caused such a large unsustainable housing bubble. The introduction of various subprime mortgage vehicles, compounded by the complete relaxation

of prudent underwriting (all driven by a securitization model wherein originators hold no liability for their underwriting decisions) feverishly stoked housing demand (and thus prices) to unsustainable heights.

To create the perfect storm, a massive and continuous supply of funds was needed to meet this demand for all mortgage forms. Insurers and other institutional investors readily supplied these funds, because, historically, mortgages had been considered almost as safe and predictable as U.S. Treasuries but with higher returns. When returns on U.S. Treasuries fell to historic lows, these higher returns caused the demand for mortgage securities to skyrocket—further fueling the supply. For a while this looked like a good bet, because investors, as a whole, did not have the data needed to understand the true risks they were assuming.

In my opinion the root causes of the subprime mortgage crisis were:

- Historically low secular interest rates.
- Lax underwriting of subprime borrowers with respect to their ability and willingness to meet their mortgage obligation, due to the incentives to maximize product for the securitization market.
- No consideration of the effect the inevitable correction in unsustainable housing prices would have on the performance of subprime borrowers.
- Originators paid as brokers rather than stakeholders, with no single party responsible for the performance of the securitized portfolio.
- Little if any analysis by investors, rather there was reliance upon the tranching and ratings of the securitized cash flows.

Once impaired mortgages were allowed to influence home prices, the contagion impact caused an artificial economic stimulus from:

- Employment growth from increasing housing demand fostered record hous-

ing starts, home-related industries, as well as commercial real estate development which masked traditional manufacturing employment weakness.

- Home equity stripping fueled the economy for several years, and delayed the recession or economic slowdown.
- Using home equity to cosmetically improve the performance of other credit vehicles (e.g., auto loans and credit cards, etc.). This increased the value of securitizations comprised of these assets. These securities are now under pressure to find their proper value.
- Excess cash was invested in the stock market, artificially pushing up those values.

The resultant market-correction has proven atypical, with stocks and bonds falling in unison, resulting in a funding crisis that needs to be resolved before the economy can right itself again.

### **THE NEED FOR A RISK ASSESSMENT METHODOLOGY**

In retrospect, we should have found it disturbing, if not shocking, that no risk assessment and justification process of any import was implemented or required in the origination and acquisition of mortgage loans. The intellectual thought and risk analysis used as justification to spend \$100 million to acquire a subprime mortgage loan portfolio paled in comparison to the diligence and stress testing that was the norm in the decision making process involved to acquire a reinsurance portfolio of \$1 million in premium.

An insurance company would never move forward with a product that, on a risk-adjusted basis, would produce a negative return. Had risk-adjusted investment returns been calculated for subprime mortgages, these would have been negative, and the terms would have been adjusted. Yet investors were prepared to risk billions of their capital without doing so.

This practice will not change unless mandated. There is already the sentiment that this crisis will pass, that the government has provided the bail out, that liquidity will come back to this market and soon it will be business as usual. If this happens, we have not learned our lessons, despite the cost.

## **HAD RISK-ADJUSTED INVESTMENT RETURNS BEEN CALCULATED FOR SUBPRIME MORTGAGES, THESE WOULD HAVE BEEN NEGATIVE. ...**

The need for a risk-adjusted system for income producing assets is now. The events of the last few years have shown that an efficient, transparent and regulated system of risk management is the only way to ensure this problem will not happen again.

Development of this system will be a substantial undertaking, and no shortcuts should be tolerated. The actuarial profession should take on this responsibility. There is no substitute for proper due diligence and valuation techniques in assessing the risk of any asset or liability portfolio. Had this been required before, this crisis may have been averted.

The lesson that actuaries and insurers should learn is that assessing and analyzing risk in investment portfolios is no less important than assessing and analyzing liability risk. The insurance industry can no longer afford to transfer this responsibility to outside entities such as rating agencies. This should be embraced internally via prudent and relentless risk management.

The actuarial profession should encourage banking regulators to adopt these standards and guidelines.

### **APPROPRIATE UNDERWRITING OF RISKS**

The vast expansion of subprime mortgages from 2002 to 2007 was both a response to and a driver of home price appreciation in several areas of the country. A large number of borrowers could not qualify for a prime loan and would have been effectively cut out of the

housing market without subprime mortgages. Interestingly, the availability of mortgages for subprime borrowers was viewed as a positive social initiative for a while. However, providing such mortgages without underwriting controls and risk recognition vastly expanded the demand for homes, a major contributor to the resultant unsustainable home price appreciation and the subprime crisis.

As an analogy, a disability insurer would never agree to cover the loss of a stated income without proof of income, and it would likely never agree to cover close to 100 percent of income, verified or not. Yet, many subprime loans were originated based upon nonverifiable income, and at a value approaching or exceeding 100 percent of the true value of the collateral. A further analogy is that there is a strong personal incentive to game the system for disability plans and subprime loans, especially when they entail cash out options. Finally, incent the underwriter to approve as many risks as possible, and you would have described the subprime mortgage origination problem.

Insurance companies have a strong heritage of underwriting risks well, and would never enter a new field of insurance risk without first understanding the risks involved, and

how to mitigate and manage such risks. Asset risk must be treated no differently.

### **THE RELIANCE ON RATINGS MUST END**

Using ratings to assess risk is no longer necessary when companies have access to enormous computing power and talent, actuarial and other. Insurers cannot abdicate their responsibility to continually assess their asset risk by relying upon single factory-inspected ratings, the relevance, accuracy and value of which decline precipitously over the life of the security. Ratings agencies have now uniformly proclaimed to regulators and the public that ratings are hardly a suitable substitute for ongoing dynamic valuations.

The results of abdicating this responsibility are obvious now, and considering that proper asset valuation could be accomplished at a cost equivalent to a few basis points on assets, there is no excuse.

### **A RISK MANAGEMENT STRATEGY FOR MITIGATING RISK IN THE FUTURE**

A rule-based or principle-based risk assessment and reserving system will bring control over the

income producing assets of banks, insurance companies and other regulated entities. The actuarial profession is uniquely qualified to develop, recommend, implement and monitor a risk-adjusted investment return system. Ideally the results would be reflected in the financial statements of all regulated fiduciary organizations. This system will come at a cost, but that cost is minuscule compared to the current cost of the bailout of financial institutions, accelerating unemployment, and the devastating results of overbuilding, overspending and home equity stripping. These far-reaching implications must lead to a change in behavior for all.

The following is a proposal for subprime mortgages. Similar analytical work should be done for other asset classes, and the actuarial profession can address these in time.

### **A RISK-ADJUSTED RETURN PROCESS FOR SUBPRIME MORTGAGES**

Specifically, the calculation of a risk-adjusted return for subprime mortgages would need to incorporate at least the following facts:

- Subprime borrowers were by their very nature impaired borrowers.

- Housing prices are cyclical and will eventually revert to a mean appreciation rate, meaning prices have to fall to get back in line.
- Artificially expanding the number of qualified borrowers will exacerbate unsustainable home price appreciation by immediately increasing demand but not supply, which would eventually catch up.
- Borrowers caught in the frenzy of buying property will migrate to mortgage products that allow them to qualify for required loan amounts, usually by allowing them to overstate their ability to pay.
- Continual topping up of mortgage amounts to property value means that during a period of unsustainable housing price appreciation, eventually there will be insufficient collateral value.
- Allowing cash out refinancing via topping up meant borrowers often had taken out all their personal equity, and these borrowers have less incentive in making loan payments when prices fall.
- A significant number of subprime borrowers were investors, buying multiple homes. They had very little incentive to make payments if they had no recoverable equity.

### **RISK ASSESSMENT**

A mortgage banker lends money to a borrower with the expectation that the borrower will repay the loan amount plus interest at an agreed schedule. The risks involved in a mortgage loan can be described as follows:

1. The risk of not receiving priced-for interest income:
  - a. Borrower not making mortgage or interest payments.
  - b. Need to reduce or not increase interest rate due to borrower inability to pay.
2. The risk of not recovering the principal borrowed:



- a. Borrower defaulting and the subsequent recovery on the asset is less than what was owed.
- b. Need to reduce the principal owed due to drop in housing collateral value.

The likelihood a borrower will default on mortgage payments varies with:

1. The borrower's ability to pay, measured by:
  - a. An expected debt-to-income ratio.
  - b. Using debt payments for the mortgage, and all debt payments.
  - c. Using verifiable income.
  - d. May include assessment of longevity in job, quality of industry.
  - e. May assess ability to stay employed.
2. The borrower's willingness to pay, measured by:
  - a. How often delinquent or defaulting on mortgage debt payments.
  - b. How much equity the borrower has at risk.

The likelihood that the collateral is less than the principal varies with:

1. The loan to value (LTV) of the mortgage:
  - a. An increasing LTV is an indication of declining borrower equity in the property and an increased risk of loss.
2. The risk that housing prices will drop prior to a recovery is measured by:
  - a. Developing a sustainable housing price trend line (national, regional?).
  - b. Using as the recovery value the value determined by the lower of the trend line or the actual property value.

## APPLICATION OF RISK-ADJUSTED RETURN METHODOLOGY

Each mortgage loan in a portfolio is assessed independently. The expectation of recovery

of principal, and payment and timing of interest owed, will be used to calculate a risk-adjusted return then for each loan. Each loan should be periodically revalued and reserved, monthly, quarterly or annually.

The fact that the portfolio is cut up, securitized or borrowed against does not change the overall risk-adjusted return, but would affect the relative return for each piece.

Application of this methodology gives the best estimate of the portfolio value under the risk assumptions used. Every measurement period this value will be updated and adjusted as experience dictates, including adjusting the risk assumptions to reflect expected future experience. As loans pay off, or are settled, those amounts would be directly reflected in the financial statements with an offsetting release of whatever reserve amounts had been held.

While it is easy to describe how this risk-adjusted return and reserving system should work, the details need to be agreed on. It makes sense to tackle this challenge now though, while home values are falling back towards equilibrium and the government is assisting banks and insurance organizations financially because of the lack of such a system.

## CONCLUSION

The need for comprehensive risk management is widespread, far exceeding the scope of merely residential mortgages. The concepts outlined above apply effectively across a wide spectrum of income producing assets. Still, securities created from subprime residential mortgages provide an unfortunate-yet-interesting example of the danger of investors being (and continuing to be) unable to drill down to analyze the granular performance of individual loans in the portfolio. In recent years, the vast majority of subprime originations focused

on packaging subprime assets into securities in a manner designed to maximize their selling price (rather than their yield to investors), even to the extent of including wholesale assignments of portions of those subprime portfolios to AAA credit pools.

This dichotomy of insurance risk management practices between income producing assets and the liabilities they fund must change. We have experienced the folly that the current fair value of an asset is best measured by its last trade price, when it is evident that such trade price was not based upon an open and objective valuation. A market price determined by the anonymous interaction of a variety of independent value-assessors, having access to all necessary valuation information, would much more accurately reflect true value.

In fact, this is essentially the implementation of the Delphi Method, described in an October 2005 report published by the SOA, in this case specifically with respect to asset value. Actuaries are well practiced in futures forecasting using experience and expectation, so there is no reason why we as actuaries and insurers cannot execute this method. Open access to data and objective valuations by insurers and actuaries who are striving to find the most accurate risk-adjusted value will serve us all well.

If we do this in the future, we will have learned our lesson well. **A**

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