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Tom Savage (President of AIG Financial Products)

In the mother of all derivative debacles which nearly brought down the insurance colossus AIG¹⁷⁵ the villain is a relatively recent financial product known as the credit default swap (CDS). How could one of the premier global insurance company, consummate in the art of underwriting risk, lose its way in writing insurance against credit risk? How could a derivative akin to a form of insurance policy against bond default unleash the default AIG itself?. First we need to explain how CDS became a key linchpin of the securitization revolution to understand AIG’s collapse.

SECURITIZATION AND CREDIT DEFAULT SWAPS

Between the subprime crisis of 2007 and the demise of the insurance colossus AIG stands the securitization revolution which made consumer finance more accessible to American households. Securitization, at its simplest, transforms old fashioned

¹⁷⁴ Brady Dennis and Robert O’Harrow. “A crack in the system” *The Washington Post* (December 30, 2008).

¹⁷⁵ It required an unprecedented bail out by the US federal government — now exceeding \$150 billion and counting.

and illiquid automobile loans, home mortgages and credit card receivable into liquid, tradable fixed income securities which institutional investors such as pension funds can readily purchase (see Box A).

Box A. What is Securitization?¹⁷⁶ First pioneered in the United States by Ginny Mae and Freddie Mac in the mid seventies the technology of securitization has truly transformed consumer finance. By repackaging illiquid consumer loans such as residential mortgages, automobile and credit card receivables — which are traditionally held by commercial banks, thrifts, finance companies and other financial institutions— into liquid tradable securities, securitization is a form of elaborate “disintermediation” which results into a lower cost of consumer finance. As illustrated in Figure 1 a typical securitization transaction is structured around six building blocks:

1. **Origination** — carried out by the financial institution which traditionally financed the transaction. It consists of managing the credit-granting process (“booking” the loan) to consumers applying for a loan to facilitate the purchase of a home, automobile or the use of a credit card.
2. **Structuring** — creating a legal entity generally known as a special purpose vehicle (SPV) for the sole purpose of the transaction using the loans as the asset collateral for issuing bonds. The SPV would typically purchase without recourse the receivables/loans from the originators who are usually invited to be one of the credit enhancers— admittedly the ultimate incentive in performing as reliable loan originators.
3. **Credit enhancement** — improving the credit risk profile of the original loans by procuring insurance coverage against default from insurance carriers such as AIG. Because default rates on large portfolios of small consumer loan can be accurately gauged through actuarial techniques it is relatively easy to price the insurance premium for enhancing credit. This assumes that consumer loans are granted under normal and consistent prudential rules and that the information disclosed is accurate which was not the case in the subprime crisis. This is where credit default swaps (CDSs) — by providing insurance against bond default — plays a critical role in making securitization a cost effective technique.
4. **Underwriting and placing** the newly-created securities with appropriate investors and finally.
6. **Servicing** the loans by collecting interest and principal repayments from borrowers to insure the proper cash-flow disbursement to note-holders.

¹⁷⁶Jacque, Laurent L. “Financial Innovations and the Dynamics of Emerging Capital Markets” in *Financial Innovations and the Welfare of Nations* edited by Laurent L. Jacque and Paul M. Vaaler (Kluwer Academic publishers, 2001), pp. 1–21.

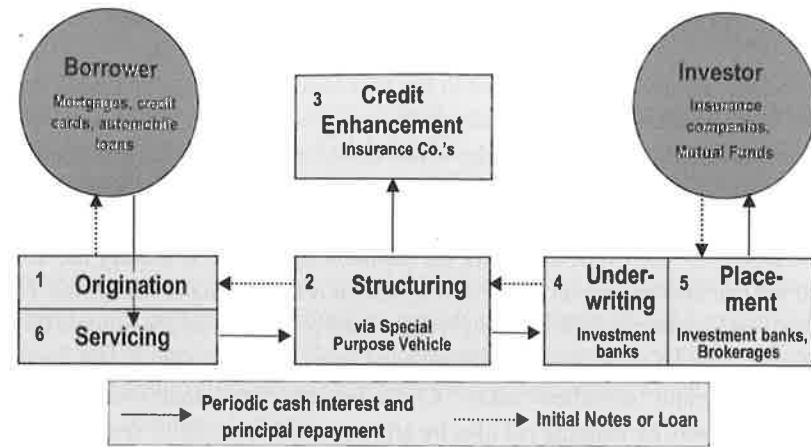


Figure 1 Building Blocks of Securitization.

Most importantly the technology of securitization hinges on credit enhancement of the newly issued securities also known as mortgage-backed securities or MBSs (because they are collateralized by the cash-flows of the original borrower’s mortgage). Credit enhancement is about providing some form of partial or full insurance against the risk of default and concretized either through more traditional bond insurance and more recently through credit default swaps. As a result, the credit-enhanced securities are better-rated and can therefore be issued at a lesser yield. Of course, credit enhancement only makes sense as long as its cost (often as low as 35 to 50 basis points) is less than the resulting reduction in interest rate paid out by the issuer of the mortgage-backed securities.

AIG, with its AAA credit rating, was a much sought after provider of such protection and indeed readily obliged by building over the last decade a portfolio of credit default swaps which had reached \$500 billion in notional value by 2008. AIG would lend its strong credit rating to lesser rated securities which as a result would now enjoy the AAA rating of the insurance carrier. AIG would receive a fee for providing the protection from default to investors. So far so good. As for any insurance coverage provided by an insurance carrier such as AIG the two key questions to answer are: what premium to charge and how much of that premium should be reserved to pay for future losses. Before answering these two questions let us review further CDS as financial derivatives.

WHAT ARE CREDIT DEFAULT SWAPS (CDSs)?

Credit default swaps were introduced in the mid-nineties as a new and more flexible form of bond insurance. Credit default swaps are over-the-counter contracts whereby the buyer (insured) agrees to pay the seller (insurer) periodic fees (insurance premium) in exchange for receiving protection against default of a loan/bond to a single borrower ("reference entity") or collection of loans such as collateralized debt obligations (CDOs¹⁷⁷). The event triggering the payment of the loss is usually the debtor's default but can also be a credit rating downgrade or restructuring of the debtor. Unlike bond insurance policy whereby the buyer purchases protection on a loan/bond he owns (see Box B), the buyer of a credit default swap may not have any material relationship with the debtor (so-called "naked" CDS). Purchase of a credit swap is therefore motivated not only by hedging but also by arbitrage and speculative reasons.

As an illustration consider the pension fund TIAA-CREF holding on January 1, 2008 \$100 million of 5 year bonds issued by Lehman Brothers with a coupon yield

Box B. How Do Credit Default Swaps Differ from Bond Insurance? *Bond insurance is provided by regulated insurance carriers to entities which own the bond being insured. Its purpose is clearly of a hedging nature unlike CDSs which allow anyone to place a bet on the risk of a firm's bond default. Banks or any unregulated entities writing CDSs are not required to set aside loss reserves (but are nonetheless subject to regulatory capital¹⁷⁸) and may hedge themselves by selling CDSs to third parties. Counterparty risk for anyone purchasing a CDS is a real issue mitigated by the posting of margin which should be updated on a periodic basis — but not on a daily basis as in the case of exchange-traded products. Buyers of CDSs are not required to own the underlying bond being insured (naked position) and often purchase them for speculative reasons. Indeed the market value of CDSs will fluctuate as the creditworthiness of the reference entity improves or worsens. The notional amount of outstanding CDS is considerably larger than the actual amount of underlying bonds on which the swaps are written. At the time of its default Lehman Brothers owned \$125 billion in bonds but the notional amount of CDSs written on those bonds approached \$500 billion.*

¹⁷⁷ CDOs are bonds whose income payments and principal repayments are based on a diversified pool of instruments including corporate, municipal and consumer mortgage debt. CDOs are "sliced" into tranches corresponding to the riskiness/seniority of interest/principal cash-flows paid by constituent debt instruments. Senior tranches are least risky and pay a low interest rate. Most junior tranches are most risky and pay the highest interest rate.

¹⁷⁸ Regulatory capital refers to the minimum amount of capital (mostly equity and retained earnings + preferred stocks) that regulators mandate insurance companies need to hold in order to meet insurance claims in a timely manner.

of 7.50% and purchasing a CDS from AIG for a semesterly fee/premium of \$350,000 to protect itself against the default of Lehman Brothers. TIAA-CREF is committed to making 10 payments through the life of the 5 year bond as long as Lehman Brothers is solvent. Should Lehman Brothers default — as it did in September 2008 — AIG will pay the full \$100 million to TIAA-CREF.

Were credit default swaps written by AIG fairly priced¹⁷⁹? Was AIG properly reserving for potential losses? Unlike traditional insurance products such as life or property & casualty where the insurance carrier amply reserves for each risk it underwrites AIG never reserved in any meaningful way for the credit default swaps that it was writing. In part its CDS valuation models consistently showed a miniscule risk of default and in part because CDS are not traditional insurance products subjected to the same stringent capitalization requirements and regulations which are imposed on the rest of the insurance industry.

A STEALTH HEDGE FUND AT AIG

Interestingly CDSs originated out of a separate unit known as AIG Financial Products (AIGFP) which was created in 1987 as the brainchild of three ex-bankers from Drexel Burnham — a Wall Street investment bank best known for pioneering the high risk, high yield "junk" bond market. For the first 10 years of its existence AIGFP prospered on selling products as plain vanilla interest rate swaps. By 1997 the unit was generating \$100 million of income with a staff of 125 and abiding by the grand bargain it had struck with AIG: ride on the parent AAA credit rating — necessary to be competitive in the business of complex financial derivatives — but never jeopardize it. The relationship was altered when JP Morgan approached AIG Financial Products in 1998 with a proposal to credit enhance (write insurance against default) on collateralized debt obligations (CDOs). Initially AIG Financial Products was reluctant to enter this new business as its ongoing success was primarily based on hedging by mitigating risk exposure whenever possible rather than speculating. Predicting corporate default is indeed different from traditional insurance underwriting and hedging CDSs that AIGFP was then writing was expensive; this made this new credit risk underwriting inherently speculative. It took fancy simulation models developed by Gary Gorton — a finance professor at the Wharton School (University of Pennsylvania) — to convince

¹⁷⁹ Pricing CDS is a thorny issue. At its simplest, the fair value of a CDS spread is determined when the risk-adjusted present value of a loss triggered by a credit event for the reference entity is equal to the present value of premium payment over the life of the CDS.

AIG Financial Products that it could sell CDSs, collect the premiums and still faced a stunning 99.85% chance of never having to pay out.¹⁸⁰

Originally, the CDOs created by JP Morgan and other financial institutions were written strictly against corporate debt. By 2003, as the real estate boom was gathering momentum, the composition of CDOs started to include an increasing amount of mortgage debt secured by real estate — so-called “mortgage-backed securities” (MBS). Increasingly the share of private label MBSs — that is, MBSs which do not carry a guarantee from Fannie Mae or Freddie Mac — steadily increased so much so that by 2005 it accounted for 29% of all MBSs. As provider of credit insurance AIG Financial Products was a prime beneficiary of the rise of the private label MBS markets. AAA-rated AIG was offering for a fee a guarantee that the US government once provided. However what AIG Financial Products failed to realize was the emerging trend of subprime lending: AIG was insuring CDOs whose share of subprime mortgages was steadily increasing (it reached two-thirds of the total MBS market).

With considerable demand for hedging these mortgage-backed securities which were fueling the housing construction boom AIG Financial Products' revenue (insurance premium) soared from \$737 million in 1999 to \$3.26 billion in 2005 with operating income accounting for 17.5 percent of the AIG's total operating income. CDSs provided a much appreciated sense of security as investors could embrace higher yielding MBSs, no longer having to worry about credit risk since AAA-rated AIG was assuming it. Unlike its many siblings in the extended AIG corporate family, AIG Financial Products did not believe in proper reserving and capitalization of the insurance products it was selling. As the President of AIG Financial Products so eloquently remarked:

“The models suggested that the risk (about credit default swaps) was so remote that the fees were almost free money . . . Just put it on your books and enjoy the money.”¹⁸¹

Because of its faulty business model it misled itself, its parent and investors in reporting a profit margin of 83% in 2005 and unsurprisingly it lavished on its employees outlandish salaries and bonuses more akin to what hedge fund managers are accustomed to than insurance underwriters actually earn:

“Mr. Cassano and his colleagues minted tidy fortunes during these cotton years. Since 2001, compensation at the small unit ranged from \$423 million to \$616 million each year, according to corporate filing. That meant that on average each

¹⁸⁰ Brady Dennis and Robert O'Harrow. “A crack in the system” *The Washington Post* (December 30, 2008), p. A01.

¹⁸¹ Brady Dennis and Robert O'Harrow. “A crack in the system” *The Washington Post* (December 30, 2008).

person in the unit made more than \$1 million a year. In fact compensation expenses took a large percentage of the unit's revenue. In lean years it was 33 percent; in fatter ones 46 percent. Overall AIG Financial Products paid its employees \$3.56 billion during the last seven years.”¹⁸²

The situation started to unravel for AIG in March 2005 when all three major rating agencies downgraded AIG's notation from AAA to AA. This was coming in the wake of investigation by the Securities & Exchange Commission and the New York Attorney-General that had forced AIG to restate its financial statements as far back as 2001, reporting lower earnings and paying a fine of close to \$1.6 billion. Hank Greenberg — architect of AIG meteoric rise and much celebrated chieftain of the US insurance establishment — had been forced to a humiliating resignation. The rating downgrade triggered an increase in collateral posting to counterparties as AIG was now contractually forced to satisfy covenants of the CDSs it had written. In an effort to vindicate his tenure as CEO of AIG and his savvy risk management Greenberg testified to Congress that:

“AIG Financial Products reportedly wrote as many credit default swaps on CDOs, in the nine month following my departure as it had written in the entire previous seven years combined. Moreover, unlike what had been true during my tenure, the majority of the CDSs AIG Financial Products wrote in the nine months after I retired were reportedly exposed to subprime mortgages. By contrast, only a handful of the credit default swaps written over the entire prior seven years had any subprime exposure at all.”¹⁸³

Indeed by late 2005 AIG had written CDSs on reference entities that contained subprime collateral — \$80 billion of it or approximately 20% of its total CDS portfolio. The seeds of AIG's demise had been sown — the subprime crisis in due course would sink the firm!

THE MORAL OF THE STORY

In the end AIG ignored the basic core principles of finance and insurance. “There is no free lunch” in life and the fact that AIG was naïve enough to believe that it could underwrite billions of bond insurance coverage without having to ever pay on

¹⁸² Morgenson, Gretchen. “Behind Biggest Insurer's Crisis, a Blind Eye to a Web of Risk” *The New York Times* (September 28, 2008).

¹⁸³ Maurice Greenberg statement to The United States House of Representatives Committee on Oversight and Government Reform (October 7, 2008).

losses is truly mystifying when it comes from one of the colossus in the insurance world.

Second, even though there may be some debate as to whether CDSs are more akin to financial than insurance products it remains that CDS are closely related to traditional insurance products and that valuation of any insurance business is actuarial in nature. By extracting from long-dated loss tables the probability of facing default the insurer is able to charge a fair premium and will accumulate appropriate reserves so that when losses do hit **they can be paid off**. More fundamentally there is a **reason why — for generations — insurance companies have thrived on selling life insurance contracts or coverage policies on property and casualty risks but have avoided business risk**. It has to do with the fundamental nature of risk and the insurance carrier's ability to measure it: mortality table for life insurance products have a great virtue — they are reasonably stationary from an actuarial point of view and each loss (when someone dies) is statistically independent from another loss (someone else death is unrelated unless there is an epidemic). Similarly floods, fires, tornados are acts of nature and are statistically uncorrelated. Business risk — that is the risk of defaulting — is different as the population of firms (and their insured loans) are subject to the vagaries of business cycles in unison (so-called domino effect): in other words, probabilities of default on business loans are highly correlated and much more difficult to gauge with accuracy.

And even if one can gauge in probabilistic terms the likelihood of default on loans it is generally easier to do it with small consumer retail loans than with larger business loans. Actuarial tables on default of mortgages and automobile loans have by and large shown great stability over the last 75 years as long as the prudential rules of loan granting are respected. However reliability of these tables hinges on the assumptions that each mortgage or automobile loans is granted under the same prudential rules. Clearly the subprime crisis signaled a major departure from past practices and had a lot to do with the rules of mortgage lending being ignored: no down payment required from the home buyer (instead of the usual 20–30 percent initial down payment) and after-tax income failing to be at least three times the carrying cost of home ownership (mortgage interest + principal repayment, real estate taxes and insurance cost). Once actuarial projections of future default are corrupted by changing underlying premises setting fairly valued insurance premia on credit default swaps becomes also flawed. As AIG believed that risk of default on mortgage-backed securities it was credit enhancing was miniscule it was under-pricing its insurance protection, over insuring and under-reserving. Unsurprisingly disaster struck AIG when default rates on subprime mortgage-backed securities started to accelerate in 2008.

POSTSCRIPT

The principal rationale for the US government's decision to rescue AIG — but not investment bank Lehman Brothers- was the fear of "systemic" risk and mayhem that the failure of AIG would unleash on the global financial system.

Bailout. On September 16, 2008 The Federal Bank of New York agreed to loan as much as \$85 billion to AIG in exchange for an equity stake of 79.9% in the firm. This amounted de facto to a nationalization of AIG. As the subprime crisis spiraled out of control, the US government's line of credit had to be increased in short order to \$122.8 billion (October 8, 2008) and \$ 166.8 billion (Nov 10, 2008). On March 2, 2009 AIG reported a record 4th quarter loss of \$60 billion and received an additional Treasury injection of \$29.8 billion raising the total bailout to \$182.3 billion. On March 2009 it was learnt that Wall Street received as much as \$90 billion in payment from AIG with most of the funds going to Goldman Sachs and Soci t  G n rale — some saw the rescue of AIG as a "backdoor bailout" of Wall Street banks.

Exit. Targeted divestitures (most notably AIG's sale of a majority stake in AIA in an initial public offering raising \$20.5 billion in Hong-Kong) and restructuring paved the way for AIG to return to profitability and full repayment of its rescue package to the US government. According to the U.S. Department of the Treasury as of December 2012 the Federal Reserve Bank of New York had provided a total \$182.3 billion to AIG, which paid back a total \$205 billion, for a total positive return, or profit, to the US government of \$22.7 billion.

Questions for Discussion

1. What is the difference between a credit default swap and bond insurance?
2. Why is securitization central to AIG derivative debacle?
3. Is assessing credit risk any different from assessing property & casualty risk?
4. Was AIG's expertise in underwriting property & casualty risk transferable to insuring credit risk?
5. Would you expect a CDO to be riskier than any single constituent loan which make up the CDO?
6. Explain how AIG was exposed to the subprime crisis. Could AIG have protected itself against the subprime crisis? How?