

# **The Making Of A Beautiful Thing**

(Or a financial weapon of mass destruction)

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*(Author's note: All is based on true story, mainly due to author's lack of imagination to make things up. However, since almost all the people, banks, agencies, and other entities are still alive, the author may have chosen, on his own discretion, not to use some of their real names, not for protecting their privacy, but rather for fear of getting sued. Moreover, all things, written here, are solely author's own personal view, do not whatsoever represent the views of his current or former employers.)*

## **A Triple-A Company Without Capital**

The phone woke me up on a Sunday morning. It was still early, too early for anyone to call me on a weekend day. I grudgingly picked up the phone. Before I could say anything, a voice came through. It was loud and impatient, even a little rude, at least inconsiderate. "Hey Captain! Are you awake?" I was only half awake, but I knew it was BK.

BK was one of the youngest in our group, the CDO team of one of the biggest banks in the United States. He was about 27 years old, just 3 years out of college. He was straight as an arrow, and to him, the world was black and white. There were only two kinds of people in the world, the ones he liked and the ones he hated. For the people he liked, he gave them various nicknames. But for the people he hated, he simply called them all "donut", because donut was a circle, looked like a zero which means nothing. He thought the people he hated knew nothing; they were all idiots, therefore they were "donuts". I must have been among the people he liked so I was "captain". BK was smart, hard working and liked to read, hard to imagine he grew up as a rich white kid in a southern state. He was an extremist, elitist, and racist, and was unafraid to say so. One of his favorite books was "The Bell Curve", a 1994 best-seller but highly controversial because it appeared to endorse the theory that on average, certain racial groups (supposedly Asians and Jews) scored higher in IQ tests than others. To the people who worked under him, he was an extremely hard and tough boss, and was somewhere in between being mildly obnoxious and simply an asshole. He showed no respect to the junior team members. People who worked in his team were expected to leave after midnight and came to office on weekends. I didn't report to him and I was much older than him, so at least he was polite to me and usually did not bother me on weekends.

So I was a little surprised when he called me on early Sunday morning. "Hey Captain, I was thinking about Atlas." "Yeah?" I was trying to keep awake. Atlas was

the deal we had been working on for almost two months now. I was not too excited on hearing the word Atlas. It had been pretty hard work, understandably, because we were trying to set up a company and we wanted it be rated AAA. To get a company to be rated AAA is by no means an easy job. Although the company we were trying to set up was much different and much simpler than a bank, but still it was going to be a financial company. Just to give you an idea how hard it was, think about this, non of the major US banks were rated AAA. Most of the banks were rated below AA.

We were doing something new. The rating agencies had not seen or rated anything like this. So the first impression was very important. Usually when we started a rating process for a new deal, we held conference calls with them and told them about the deal over the phone. Not this time. For this new company Atlas, we dressed up and went to the agencies to meet their senior managers face to face. All three major rating agencies told us that they were happy to take up the challenge and work with us to create a new and cutting edge financial company. However, one of the more famous agencies, Sun Base, also told us that to give a company AAA rating, their policy is for the company to have a minimum capital of \$300 million US dollars. Plus, we were told that we needed to build a model to quantify the potential financial loss this company could withstand under stressed market conditions and use that to determine additional capital needed. Three hundred million dollars was not a small amount. We could not use any of our bank's own money since we needed this company to be totally independent of our bank. So we needed to raise the entire capital required from investors. That was not easy and we could fail if we could not find enough money.

I was still half asleep when BK's voice came through the phone, "Why do we need any capital? I don't think we need any capital. We need zero capital." BK always spoke in a short and succinct way. I never heard him using three sentences to just say one same thing. So he was very wordy and redundant today, but that not only woke me up sufficiently but also get me really excited. I knew immediately what he was talking about. No capital, non, zero! Of course, it was so obvious! Why didn't I think of it before? "Donut!"

It was an Eureka-type of moment for me, and I was completely awake now. Hanging up the phone, I was getting ready to go out to play my routine Sunday morning soccer game. When I started driving, I was still a little light-headed. When a policeman stopped me, I knew I committed two crimes: speeding and passing another car illegally. The police officer was a handsome and polite young fellow. He asked me: "Do you know why I pulled you over?" I replied innocently: "Not really." So we went back and forth. Without raising his voice and still very politely, he said, "Let me ask you one final time, did you do something wrong?" I looked at him and paused a few long seconds. "Yes, I did". He smiled, "If you answered any other way, I'm going to give you a ticket."

I drove away thinking, “What a great country!” The sky was blue, the air was clear, the soccer field was big and empty; even the police was so nice. And most unbelievably, we could set up a triple-A company without any capital!

### **BK’s Last Straw**

BK joined our bank’s CDO group right after college as a first year analyst. His boss was a laidback southerner whose demeanor resembled a Carolina redneck more than an investment banker. Naturally they clashed. After one year, BK got a bad review, zero bonus and was almost fired. Then he found Huaping and New York City.

For historical reasons, our CDO group was split in two teams, one was based in bank’s headquarters in Charlotte, and the other was in New York. In 2001, the whole CDO team had less than 20 people, and only three were in New York. Those three in the big apple city was led by a TBA (Taiwanese Born American) Huaping Chang. He went to the US as a teenager, and like many children grew up in a Chinese family, excelled as a student and eventually graduated from MIT. Unlike many other second generation Chinese, he could speak fluent Chinese and even more amazingly, he kept his Chinese name.

Around the same time when smart MIT graduates went to the silicon valley and helped to launch the history’s most fantastic IT revolution – the “new new thing”, in NYC a small number of financial specialists had quietly worked on something also new and almost as “fantastic”. This new financial instrument has a very academia name “collateralized debt obligations”, or CDO. Ever since I got into this field, I had trouble explaining to people asking me what I did in my profession. Every time, ten minutes into my description of what a CDO was, the listener would politely nod and say something like “very interesting”. I knew he had no clue what I was talking about. One benefit I got from the financial crisis in 2007 and 2008 was that I didn’t need to explain any more. All I needed was to utter the three-letter word and people would immediately nod understandingly. They probably still didn’t know exactly what a CDO was, but they certainly were capable of grasp what a CDO could do, much alike I know perfectly well how much damage a nuclear bomb can induce without knowing how it really works.

Almost five years ago Mr. Warren Buffett referred to financial derivatives in general as “weapons of mass destruction”. It probably would not be too far-fetched to use this phrase for CDO since many people believed that CDO was one major culprit for the current mass destruction of the financial institutions around the world.

Back in the year of 2000, when BK was on the brink of being fired, he called Huaping and tried to grab the last straw. Huaping and his two other colleagues were sitting at a quiet corner of the New York trading floor, working on a new deal which

later turned out to be perhaps the first real estate CDO. Huaping took BK under his wings. After I joined two years later, we then started a joy-ride of the great CDO wave for the five years following.

### **The Boss' Private Box**

About the same time when BK made that fateful phone call to Huaping, I was sitting in Mr. George Steinbrenner's private box at the Yankees stadium watching my favorite pitcher Roger Clemens winning the battle with the visiting team, the Chicago White Sox. The Yankees had been the richest team in the Major League Baseball (MLB) in recent years, simply because its owner George Steinbrenner was willing to spend millions of dollars to get the big ticket players such as Roger Clemens and A-Rod – the most expensive player in baseball. A big spender, George Steinbrenner also expected big return from the team. Nothing less than a world series could please him. He always seemed to hang over everyone's head, thus earned a well deserved nickname, "the boss". At least in New York, the boss was a larger than life figure. So when I sat in the leather sofa in the boss' private box that cool summer evening, beer in hand, watching the game from such a vantage point, I couldn't help but feel important. But really, I was just a "nobody".

A "nobody" working on the buy side is "somebody". That's how it works. In the games of seller (Party B) and buyer (Party A), Party B always takes care of Party A. I was working for Citibank's PBG, the Private Banking Group, which was the biggest buyer in the budding business of CDO. We were the paying customer, so we were the Party A, well treated and pampered by Party B. Of course, such pampering must involve golfing.

Barbara Piasecka, a Polish girl, came as a student to America, and worked as a cook and chambermaid for the billionaire Seward Johnson, the son of the founder of the Johnson & Johnson. She later became Mrs. Johnson, Seward's third wife. They lived near the famous New Jersey town of Princeton. After her husband died, she moved to Monte Carlo in Monaco, and converted their estate in New Jersey into a country club and their residence the clubhouse. No wonder, that clubhouse is the most beautiful clubhouse I have ever seen; and the golf course is the nicest course I have ever played on. I was not much of a golf player, neither were any of my colleagues. But it didn't matter. We started the morning with a banquet, served by well-groomed and white-gloved handsome waiters. The silverware was made of real silver which somehow made the food taste more expensive. After my playing partner and I splattered the golf balls in trees and ponds, and dug many ugly holes in the beautiful fairways, we sat in the gorgeous clubhouse, beer in hand. We smoked a cigar which was hand prepared and cut on the spot. I always thought that smoking a cigar was not for enjoyment. Smoking a cigar was to make one feel that he was important, a "somebody".

This easy job, associated typically with a buy-side Party A position, could get boring. After a couple of years, I was hungry for more action, more uncertainty, more challenge. But honestly, what I was really looking for, was more money. In mid 2002, I jumped sides. I left the comfortable buyer's job and joined the tough life of a seller. But that was the start of the real fun. After I joined the CDO team with Huaping and BK, I realized I just got on the roller-coaster ride. It was fast, dangerous, powerful, exciting and fun, and, I need to fasten my seat-belt.

## **Financial Engineering**

My 6-year old son had a classmate whose dad was a US diplomat working in the American consulate in Hong Kong. So when the USS Shiloh, a US Navy missile cruiser, came to visit Hong Kong recently, all the boys in my son's class went on board to check out the real thing, not their warship toys. When the navy officer greeting us said to the kids, "Please remember this is a working ship, it's like visiting your dad's office. Someone is working here. Please be quiet and don't run." It struck me that this was my first time ever to be on a real battleship, and the people in the pretty uniforms were not tour-guides, they were the elite United States navy fighters. USS Shiloh was a relatively small ship. But it had all kinds of missile launchers and guns, plus two helicopters. With all these bells and whistles, it impressed upon any visitors that this was a weapon of highest technology and the most awesome destroying power. What was even more impressive was its central control room. The room was laid out like a bank's trading floor, open space, rows of computers, large over-head screens, sophisticated phone systems with microphones and speakers. The difference was, in this room, there were many buttons of various colors. We were told these buttons were the triggers for all the missile launchers and the guns. If the USS Shiloh was engaged in a battle, all the fighting would be done here in this room. With the modern high-tech graphics, it must feel like playing a computer game, except that when you push a button here in this room, real people may get killed.

On board of the USS Shiloh, I was thinking that the US President George Bush, as the highest commander of the US military, must have frequented such high tech warships and all other magnificently powerful arsenals for hundreds of times, and besides feeling really proud of the technology achievement, he may have also felt certain invincibility which may have made it easier for the president to pull the trigger to start a war. On the height of the Wall Street innovation in the early years of the new millennium, the financial engineers with supreme confidence must have similar feelings of their invincibility. They were working for the most powerful and the richest financial institutions; they were right at the center of the financial universe; they were trading, dealing, creating new financial instrument everyday.

It may not be a gross exaggeration to say that the modern financial system was

largely built by engineers, well, at least the derivatives market and the so called “structured products” market which became uncontrollably huge. Especially during the last decade of the last millennium, Wall Street had grabbed a large number of Ph.D.s in mathematics, statistics, physics, and other quantitative fields. These so called financial engineers were building platforms and infrastructures for trading and financing with sophisticated mathematical models and black-box computer codes. It felt like the whole capital markets were operated on the trading floors filled with rows and rows of computers. People use computers to build financial instruments, do trades and make billions of dollars flowing through in the market place around the world. Much like the military invasion and the destruction of Iraq by the US forces that were pretty much played out from a control room full of computers but thousands of miles away from the real battlefield. The politicians and army generals issued orders and glass-wearing, expressionless and faceless staffers, who had never seen a battlefield, pressed computer keyboards, and the war was started and finished.

When we drew the blueprint of the financing company, we knew exactly what we were to build, how to build. We were going to build a company of humongous size, \$12 billion dollars, precisely, on a computer designed model. It was a model of high mathematics, and detailed simulation of almost every aspect of the company. Assets of the company were “total return swaps”; the portfolio of these assets could be as large as \$12 billion, and could contain thousands of individual bonds, loans, and other types of financial securities. The model would not only simulate the act of each individual asset but also their correlated behavior. The liabilities were “commercial papers” and “mid-term notes”, with maturities ranges from 30 days to five years. Moreover, the “margin” arrangement between the borrowers and the company was also modeled. Just imagine the level of difficulty, the types of assets ranged from simple things like bonds and loans, to more complicated structured securities like Residential Mortgage Backed Securities (RMBS), Commercial Mortgages Backed Securities (CMBS), other securities backed by all kinds of collaterals including consumer credits (ABS), and most interestingly, various types of CDOs. Then, the details, like the old saying goes, “the devils are in the details”. The timing, the mismatch of the timing of the cashflows of assets and liabilities, the price movements, the rating changes, the defaults and recovery, etc. all of these nuisances, obviously needed to be “accurately” modeled, calculated and simulated. Today, if someone tells me that all these can be simulated by an elegant mathematical model with any realistic accuracy, I will be tempted to say that he’s probably an overly confident idiot.

But that was exactly what we did in 2003, back in the hay days of the world economic prosperity, when full of miracles were created by financial engineering. We told the world we could do it, and the world believed us. That included the powerful rating agencies, whose words worth millions of dollars. This financing company was going to get the top ratings and became a powerful funding machine, so powerful that we named it after the mighty Greek god, Atlas.

## **The Game of Leverage**

Atlas was a great idea for making money. We called it a “highway toll-booth”, you just sit in the booth and collect money from every car that passes by. We also called it “cash cow”, because a cow eats grass and produces milk. Here with Atlas, we put in very little resources and it produces huge profits. Although the structuring of the company employed complicated tools in financial engineering, the business idea was very simple.

In the year of 2003, a particular type of fund was very popular which was called the “hedge fund”. It was not clear how the name came about, but the purpose of such funds was by no means to “hedge” risks anymore in recent years. On the contrary, most hedge funds were set up with the sole purpose of seeking the maximum return and were not in fear of taking higher risks. One particular type of risks is called “leverage”. Leverage is like a magnifier: it magnifies your profit if the market moves in your favor, but it also increases your loss when the market turns the other way. A very simple way to leverage is to borrow money to invest. Suppose you buy \$100 stock, but you only put in \$50 of your own money. You borrow the other \$50 to make the \$100 purchase. Then you are two times “levered”. If the stock price goes up \$1, namely 1%, your profit will be 2%. But if the stock price drops \$1 or 1%, your loss will also be 2%. Ignoring any transaction costs, roughly speaking, if you leverage two times, your profit or loss will double the actual price move of your investment.

## **Cost of Borrowing Money**

The idea of Atlas was to lend money to such hedge funds for their leveraged investment. But where would Atlas get its money to do this? By borrowing. There is a cost to borrowing money – it is called the cost of funding. For Atlas to make a profit, the cost of its funding must be lower than the lending rate it charged the hedge funds. It is easy to understand because that is how the banks make money, at least, a traditional bank. A bank pays its depositor 4% and lends to a loan borrower 7%, and pockets 3% as its profit. A bank can do this because, well, because it is a bank! Because everyone has faith in a bank and knows it is safe to put money in a bank as deposit, and is willing to accept very low interest rate for this safety. Now Atlas is not a bank. It is a company which specializes in lending money to hedge funds. This certainly sounds a little scary. Would I be willing to lend money to Atlas? Probably not, unless someone whom I trust tells me it is safe to put your money in it. And that “someone” is a rating agency.

Currently there are three rating agencies which are widely accepted and trusted globally. For an investor to buy bonds, a major concern is the bond’s default risk which is the risk that the issuer of the bond is not able to pay back the principal to the

investors. These rating agencies are powerful authorities who are to determine the worthiness of all the companies which issue debt, and give these companies “ratings”. The investors will use these ratings to assess the riskiness of their investment. The highest rating a company can have is AAA. Below the AAA-rating, it is AA which most global banks are rated at. So to buy a bond from a AAA-rated company is even safer than putting your money in a bank. And if you get 3% from your bank deposit, it only makes sense you would get even lower interest from a AAA-rated bond, right? Which means, a AAA-rated company can borrow money at a very low cost, on theory, it could be even lower than a bank is paying for its deposit.

Well, that was what we were aiming at for Atlas. We would get Atlas the highest rating AAA for a company so we could borrow money at the lowest cost.

### **Borrowing Short Term Money for Long Term Investment**

If you go to a bank to make a term deposit, the longer the term the higher the interest you can get for your deposit. So for Atlas, not only we wanted to get the highest rating, but also we wanted to just borrow money for the shortest term. Luckily for us who were seeking short term borrowing, there was a huge and extremely active market for doing this which is called “commercial papers”, or CP. Issuing a CP is indeed one of the cheapest ways for a company to borrow money. So the decision was easy, Atlas would borrow money from the CP market.

By the same token, Atlas would lend money for longer terms. As a matter of fact, the longer the loan the higher the fee Atlas could charge. So in a typical case, Atlas would borrow money for 30 days, and would use this money to lend to a hedge fund for 8 years. What happened when the 30-day was up and Atlas needed to return the money to the lender – the CP investors? Simple, Atlas would borrow money for another 30 days, issuing another 30-day CP. This way, Atlas was “rolling” its 30-day short debt.

It all sounded very well except for a small problem. What if there is no one willing to lend Atlas 30-day money anymore? Or the 30-day money suddenly becomes very expensive? Well, we will find some banks to standby and give Atlas “emergency” loans to pay off the 30-day CP if Atlas could not “roll” its short term debt. These standby banks are called “liquidity providers”. Of course Atlas needed to pay a little fee to these liquidity provider banks.

### **Pricing the Liquidity**

However, the interesting thing, or the trick of the arbitrage, was that nobody seemed to know how to price the “liquidity”, because nobody knew how to assess the

risks of providing such liquidity. In theory, the risk occurs when the short term debt can not be rolled over. Since Atlas would have the highest ratings, it was likely that such a risk would be a market wide condition, where the short term debt prices would drop so much that their yield would be as high as the long term debt.

If we believe the saying, “there is no bad bond, there is only bad price”, we would think it reasonable that the liquidity risk would occur when the 30-day Commercial Paper yield gets as high as the yield of the long term bond. And when that occurs, the loss of the liquidity provider would be the price drop of the short term Commercial Paper to the level of a long term bond. We started with the most commonly used interest rate models and used the historical data to calibrate the model parameters. The whole modeling and calibration process seemed very scientific and the foundation looked solid. As part of the bank’s standard model control procedures, the model as well as the parameters were carefully validated by the risk management.

Since the liquidity facility was often huge, and it affected the liquidity providing bank’s balance sheet and capital charge, the liquidity pricing attracted much attention from the bank’s senior management, as well as from senior managers of several affected departments such as Treasury, Finance, and operations. Incredibly, after endless meetings participated in by all these various divisions and numerous senior managers with abundant industry experiences, it was eventually accepted that the “fair market” pricing of the liquidity of Atlas calculated by the model we created was valid.

That liquidity price, thoroughly examined and validated by both senior management as well as the quantitative risk management, came out to be nearly zero. The most interesting thing was back in the year of 2003, the low liquidity price surprised no one. It had been a widely held belief that such liquidity was worth very little indeed.

## **Achilles Heel**

In the ancient Greek myth, the undefeatable warrior Achilles, when he was an infant, was dipped in the river Styx by his mother holding onto him by his heel. His whole body touched by the water became invulnerable to wounds except his heel. Achilles, as powerful as he was, eventually died from an arrow piercing through his heel.

The financial crisis which started in mid 2007 was a complex problem and each clever observer would offer at least one different explanation as for why it happened. But this much was clear and almost had no dispute: the arrow of “subprime” hit the financial system’s Achilles heel, the “liquidity” in the system, and that started the big crisis. The first sign of it was the fall of several financial structures whose liquidity facility collapsed. These structures invested in long term bonds of the so called

“subprime” mortgages. The money used to buy these bonds was raised by these structures from borrowing short term debt. Although the design of these structures was very different from that of Atlas, the fatal weakness, its Achilles heel, was pretty much the same. The short term lenders of these structures fled with their money on hearing the first bad news of “subprime” and they never returned.

It was not different from a run on the bank. When people got the slightest hint that the bank might be in trouble, they took their money and ran. If the bank could not come up with enough cash to meet the withdrawal, it might become insolvent. So when the short term investors escaped from these grand financial buildings in fear of the “subprime”, they were left with two choices, either they had to sell their “subprime” bonds at fire-sale prices, or they needed to draw money from the liquidity providing banks.

At the peak of the market around 2006, the “subprime bonds” were selling at historically high prices. Financial engineers were busy constructing these highly leveraged investment vehicles. All the commercial banks and investment banks were providing liquidities to these vehicles. The liquidity providing banks thought they were facilitating short term needs, and did not expect these “short term liquidity” needs to tie up their huge amount of capital and eventually made them suffer big losses.

The Achilles heel in these financial structures escaped everyone’s attention. The liquidity facilities were not rated explicitly, and the provider banks were not required to consolidate the risks on their balance sheet. Looking back at the unfolding of the crisis, it became apparent that the “weak-link” was in the liquidity facility of these seemingly well built architectures.

### **Dealing with Rating Agencies**

After BK’s early Sunday morning phone call, we told all three rating agencies that the capitalization we intend to provide for Atlas was actually zero. Sun Base, the agency which told us that their policy required at least \$300 million dollars for any AAA-rated company, immediately shut its door on our face and basically told us that we were day-dreaming. The senior relationship manager at Sun Base covering our bank, Nick, was nice and warm guy. He and I were on very friendly terms and almost like buddies. In fact we came from very different background and we really did not have a lot of things in common. But then we found out that we both went to Brown University which was pretty rare, since Brown was so small and not very well known. I remember once I was wearing the university T-shirt, and so many asked me why there was the word “Brown” on it. I was tired of explaining so I simply told them it was the color of my T-shirt for color-blind people in case they could not tell.

Nick's response to my request of zero capital for Atlas was, "Sorry, my friend. I wanted to help you, but it's our policy. I can't give you AAA rating unless you capitalize your company with \$300 million dollars. I can probably try to lower that requirement although it's extremely hard. But to go down to zero, you guys must be crazy." I told him that whether they wanted be involved in rating Atlas, it was their choice, but we were determined that we would not put in that much capital.

The other two agencies were more flexible. They did not have pre-set minimum amount of capital requirement. Mount Moon is a very old agency which started providing rating services for corporations more than 80 years ago. It is very reputable and certainly has global investor's faith in it. The lead analyst, Carlos, assigned to rating Atlas was the smartest guy I have ever been associated with. He was a former Bankers Trust derivatives trader, and definitely had a trader's charisma. Explaining to him your idea, before you could finish your sentence, he already got it. The greatest thing about this guy was that he was not afraid of making decisions on the spot and not afraid of taking responsibility. He was a rating agency analyst but acted totally as a trader thinking on his feet. He also talked very fast with his heavy south-American accent. I did not know exactly how old he was, but I was told that he was in his 50's, and he just had a new born baby with his wife who was a beautiful Peruvian half of his age. From the very beginning, he understood us and he knew exactly how he would approach Atlas to quantify the risks. He would build his own model and told us that it was a pretty straightforward project. I was thinking to myself, "What a great pleasure to work with such a smart guy!"

The third agency, Fair Lake, was clearly behind the other two in the ratings market share, but was quickly catching up. Usually for the more complex deals we had done, investors would like to have ratings from two agencies. While the ideal would be the top two agencies, Sun Base and Mount Moon, but most investors would also accept Fair Lake as the second rating agency on the deal. Since Atlas was such a new and complicated structure, we knew it would not be an easy job to get the highest ratings. We would not need all three agencies, but nevertheless, we still liked to work with all of them and keep all in the game just in case one of them would not cross the finish line. The team leader from Fair Lake was Liz, a lady originally from south-east Asia who liked to ask tons of questions. The main analyst was Alan, one of the nicest persons and most soft spoken guy I had ever met. Alan and Liz, occasionally with two other people, were very detail oriented, called us everyday and asked us about everything. To work with them was painful and slow, but we were chugging along. I had no doubt in my mind that among all three agencies, Fair Lake was the one most likely to get to the finish line with us. That was, if we wanted them to.

### **SPV – The Special Purpose Vehicle**

Our 8-person team at Citibank used to manage over \$6 billion dollars CDOs for

our investors. Each of such CDO was a company (called Special Purpose Vehicle, or SPV) incorporated in one of the so called “tax heaven” jurisdiction which in most cases was an island, such as Bermuda, Cayman Islands, or Channel Islands. The main reason why a SPV is used to do a CDO or any other types of securitized deal is to isolate the investment assets from potential bankruptcy risk of any related entities. For example, if I invest in a pool of mortgages, I would just want to take the risks of the mortgage borrowers, not the mortgage issuing banks or any other institutions serving the mortgages, or any related parties. These SPV does not have real employees – it out-sources all the work to other companies. The most important work includes the asset portfolio management, the administration and the trusteeship. These jobs are hard; particularly the administration and trustee work can be very labor intensive.

But there was also a job which involved nothing more than keeping an address and a mail box. I always thought that if only I could be this guy hired to maintain a mail box for hundreds of these SPVs. I would not need to have any special skills or knowledge, and need do absolutely nothing, because no meaningful mail would be sent to this address anyway. I would just drive my expensive BMW to play golf on the stunningly beautiful course on the edge of the ocean. What a life!

The funniest things about an SPV are its board and its stock holders. The stock holder of an SPV is typically a charitable organization. But don’t think that setting up a CDO is charity work though. Holding stock in an SPV has no economic significance. The stock value of a billion dollar SPV can be as little as one dollar. The more interesting part is an SPV’s board. Members of our group were the board members of these companies. Every year, we travelled to the islands to attend the board meetings. These meetings often lasted for 3 days, with one day for golfing, one and half day shopping and sight seeing, and the rest half day for a meeting just to go through formality in an utterly meaningless way.

### **The Company Must Be Independent**

The CDO, or the SPV, is created by the bank, but it must remain independent. It can not be seen as a subsidiary of the bank, and the bank can not be seen as its parent, otherwise, the bank would need to put its SPV on its balance sheet, which is pretty much the end of the world. Why? Because if these SPVs appear in a bank’s balance sheet, the bank’s asset will be increased many fold. Worse, in most cases, these assets are risky assets. So the bank must set aside enough capital for these risky assets. This will certainly affect the bank’s return on capital, which will negatively impact upon the bank’s financial performance. Therefore, the bank’s stock would fall, eventually, the bank CEO’s wallet would suffer. So you can see, whenever we do a CDO, or set up any kind of SPV, the first thing on our checklist is to go to an accountant and if there is the slightest doubt about its off-balance sheet treatment, it’s a non starter. The key word is “consolidation” which means including the SPV in the bank’s balance sheet.

Some smart minds have been engaged to create very clever schemes which have fooled accountants so that a company, although it had a lot of risks in the SPVs it created, did not have to consolidate. Because of this, a company could appear to be a lot less risky and much healthier than it actually was. There used to be a company which was touted as the best company in the world, the most desirable place to work, and had the smartest employees (well, the last point might be true). Then the company fell. This company was Enron, or to call it by its more colorful and perhaps more appropriate name, “the falling angel”.

Falling with Enron was Arthur Anderson, one of the “big five” world’s renowned accounting firms. The US Financial Accounting Standards Board (FASB) quickly issued Fin 46. It was an interpretation instead of a standard just because FASB wanted to issue this in a relatively short period of time. The main purpose of Fin 46 was to make those smart people’s life hard. Those smart people, who lived on making SPVs, needed to be really creative to continue their line of work to make a living. Becoming creative, they did. They continue to make hundreds of thousands of SPVs which eventually helped to bring down the once powerful giant investment banks Bear Stern and Lehman Brothers.

### **Don’t Leave a Message When You Call**

When we first conceived the idea of creating a financing company, we knew we could not afford to have it on our bank’s balance sheet. Since this company would have a large amount of assets and these assets would be mostly risky (hedge funds were attracted to more risky assets in seeking higher return), we would need to hire the best accounting firm to give us a clear opinion regarding the independence of this new company. Naturally, we requested the service of one of the “big four”.

Most of the accounting work regarding the consolidation issue was around the Appendix A in the Fin 46, which required building a quantitative model to calculate the “expected loss” and the “expected return”. Our team proposed a highly sophisticated mathematical model using a Monte Carlo method. This is one of the most popular and very effective methods to solve a mathematical problem in finance. Randomness is the basis underlying the betting and gambling, which are the core business of the famous casino, Monte Carlo, in Monaco. One of the common things in finance and gambling is that in both cases, the future outcome is unknown. The stock price going up or down may very well be determined by flipping a coin – head means stock going up; tail going down. According to some of the modern finance theorists, if the market is completely efficient, the price movement will be totally random. To prove this theory, the Wall Street Journal ran continuously a test in which several experts would use their expertise to pick stocks against a monkey throwing darts to randomly select stocks. After a certain period of time, the performances of the experts

and the monkey were compared, and there was no statistically convincing evidence to show that the experts performance was superior to that of the dart throwing monkey.

I'm pretty sure that the Wall Street Journal had done this experiment simply to have some fun. But we were genuinely serious about this. We built the complex mathematical model and composed dozens of pages of computer codes to simulate the future financial market movements. For each potential future movement, the model would calculate the "loss" and "return" for the company. After tens of thousands of such simulations, we would get the "expected loss" and "expected return" by certain types of averaging the individual outcomes. The model was built by our team which was a front office business desk. According to the bank's policy, any models used for P&L (profit and loss) and financial statement calculations would have to be validated by a back-office quantitative analytical team. The validator was a bright young guy with a Math masters degree from MIT. He worked diligently for a month and actually rewrote his own computer code and eventually was able to reproduce the exact same results. He was happy with the model and authored a 20-page validation report to express his happiness.

However, that was not the end of it. The accounting firm we hired to issue an opinion regarding the consolidation treatment also sent a team of two Math Ph.Ds to check on the model. One of them flew to Charlotte from New York to meet us in person several times. The other worked from his office in Texas and communicated with us through internet and phones. The Texas guy, George, was not a cowboy. He was a Chinese whose English had a heavy southern province accent. He was a thoughtful patriotic. Living in Texas, the heart of the America, his own heart was always with China. Whenever we were on the phone, we would spend only 5 or 10 minutes on the model but would talk for 30 minutes about a certain plan to go back to our motherland to serve the country.

It was a long and painful process, but after numerous endless and boring meetings and a lengthy and tedious model validation, the accountants finally prescribed to us a clean bill of health, announcing that the company Atlas would not need to be consolidated with the bank's balance sheet.

Years later, there were not many exciting things I could remember about our dealing with the accounting firm, but one thing stood out in my memory. Once I made a phone call to one of the accountants working on our deal and only got his answering machine. I made the mistake of leaving a 5 second message asking him to call me back. In the next fee statement sent to us by the accounting firm, the 5-second voice message was charged for a 15-minute (the smallest charging unit) accountant fee, which, if my memory serves me correctly, amounted to about \$200 dollars. This probably qualifies as the most expensive 5-second phone message in the history.

## **Beautifully Scary Financial Architecture**

The most wonderfully scary architecture in the city of Beijing is the CCTV tower. No one in his right mind would believe it can actually stand like that. But incredibly, it does stand like that, beautiful but very scary to look at. Atlas, our financing company, when we built it, was even more scary if it could be seen as a building. Now use your imagination. Atlas borrowed billions of dollars and lent right away to hedge funds, which promised to return the borrowed money, or otherwise, to give up their invested risky assets. In the mean time, Atlas had no capital itself. It ran its billion-dollar business largely on a bunch of complex mathematics models. It was not only scary, it was spectacularly frightening!

Mount Moon's analyst, the former derivatives trader, Carlos, loved Atlas at the first sight, which was not a coincidence. He thought Atlas was strangely daring, dangerously beautiful, and above all, not conventional. He had absolute faith in himself, his mathematical ability to model the very complex financial instrument, his supreme power in accurately grasping the hidden real risks. We loved the guy, not only because he was the easiest to work with, always responsive and always knew what he was talking about, but more, we loved the guy because he had a big ego. His ego made him to think that he was always the smartest person in the room. He obviously made the decision from early on that the architecture of Atlas would stand. So he did his own work to support the concept and he believed it was worthy of the highest ratings if designed properly.

While the Mount Moon was basically a one-man show, Fair Lake was all about team work. They would not even speak to us unless there was the whole group of them on the calls or in the meetings. They were following the rule book to each single word. There was only a small problem: there was no rule book to follow for Atlas. Probably to compensate for the lack of guidance of their existing rating criteria for this, they put in a lot of resources. Their team working on Atlas eventually grew to five people, the largest I had ever seen for a rating team dedicated to a single transaction. Still, the progress was very slow. There was just too much back and forth on each tiny detail, and endless discussions at each turn of the road.

We seemed stuck in low gear with Fair Lake. More bad luck, the quick-handed Mount Moon's resourceful Carlos was also slowed by a new born baby. As a dedicated father, he simply stopped work. We dared not to ask Mount Moon to change to a new analyst. Usually, rating a deal, no matter how complicated the deal was, for such an established agency with such a long history, should not depend on an individual analyst. But this time, in case of Atlas, it did make a huge difference who the analyst was, and we would do anything we could to keep Carlos as our lead analyst.

Just as we were in this hopeless situation without going anywhere, a phone call

came from Sun Base. Nick, their senior relationship manager who covered us, phoned in to have a check on how we were doing on Atlas. “We are doing fine”, we told him. “Can we still join?” We pretended that we did not care, “Well, it depends. Are you still asking for at least \$300 million dollars for capital?” He paused and then said, “Let’s talk”.

So we started to “talk” with Sun Base. And the “talk” went on and on and on, for a whole year. For a period of four months, we conducted daily conference calls with the Sun Base team, particularly with their quantitative analyst, Cristina. She was a brilliant math Ph.D. from Romania. She immediately understood the big picture, but her rigorous training instilled a deep suspicion. She seriously doubted that it was within human being’s capability to build such a comprehensive computer program to simulate this complex company with any accuracy. As a solid mathematician, she knew very well that in building such unbearably complicated financial architecture, we had to cut a lot of corners. She requested this daily conference call and spent one hour every day for four months, just to make sure she agreed with us that each corner we cut was minor enough that the whole system was indeed safe. We often conducted conversations which would occur only between the two math Ph.Ds. We would also occasionally be carried away by our discussions of things like the limits of mathematics, and the philosophical (ethical?) values of financial engineering.

In the end, she approved the model. I truly did not know whether she approved it because she knew at the bottom of her heart that it was beyond a human being’s ability to model such a thing, or she fundamentally accepted the reasonableness of an imperfect mathematical model. Mount Moon’s Carlos finally came back from his happy sojourn. Without much of further communication with us, he simply announced that he was done with his quantitative work, and our adventurous financial architecture was good to go. Fair Lake’s team leader, Liz, left the firm which conveniently offered us an excuse to cease their rating service. I felt really sad because I liked Alan and the rest of the team.

After on-site due diligence by both rating agencies, the deal was officially closed. After two long years, Atlas was completed. Standing as one of the most strangely beautiful architectures, in the new millennium’s world of high finance, shoulder to shoulder with numerous others fantastically and heavily financial engineered structures.

## **Epilogue**

Soon after the closing of the deal, I left the United States. I heard that the financing company, Atlas, made so much money that the stock holders of the company had 100% of their money back in the first year of operation. It came not as a surprise, it was fully expected. The capital of the \$12 billion company was so tiny – it

needed just around \$10 million dollars. This was about 1200 times leveraged, roughly 100 times more leveraged than a typical commercial bank in the USA!

Not only did Atlas made a lot of money for the bank and its stock holders, it also helped us to create other award-winning structures. In the following two years, we used Atlas as the main funding source for two deals, each of which won that year's "best deal of the year" by well-known magazines. There were other banks which wanted to replicate its success. Sun Base senior manager Nick told me that not long after we closed Atlas, Deutsche Bank hired away one of his rating analysts who worked on Atlas and tried to create one of their own. The four members of the Atlas team in our bank all moved on to better positions. BK became the head of the CDO group; another colleague was promoted to the head of the Corporate and Investment Bank treasury. The most junior member in the team went to New York and joined Citigroup, and became a team leader who closed many deals thereafter. I was sent to Hong Kong to pioneer the bank's Asia businesses.

When I look back, the two years I worked to create Atlas were the most exciting times in my Wall Street career. It may not compare with the entrepreneurs creating the "new new thing", the so called "most spectacular legal creation of wealth", in the Silicon Valley. Nevertheless, we experienced a similar creative process. Just a handful of people put their heads together, started from a simple idea, and set to work on it. The ultimate driving force is nothing but the overflowing confidence typical of the time – the power of financial engineering was so awesome, so uninhibited, and so capable that we truly believed that there was nothing we could not accomplish. However, the macro environment also could not be more cooperative. The Fed Chairman Alan Greenspan was the champion of financial innovation, and was fighting off regulatory advances on all fronts. We had enjoyed a most friendly time to create something that was totally unimaginable in another time.

About three years after Atlas started its operation, the US financial industry went into one of its worst crises in history. Atlas, the once top rated financing company, like so many other financial architectures bravely conceived and beautifully built by imaginative financial engineers, was blamed as the main culprit for causing the crisis and for destroying the world financial systems.

Was it really true? Are these structures truly the financial "weapon of mass destruction"? We are still in the middle of the crisis, and it is too early to draw a conclusion. There will be a time when the dust is settled and the crazy financial world goes back to normal. When that time comes, I will sit down, sip my tea or beer, and I will look back and tell the rest of the story about Atlas.