

Weapons of Mass Destruction: OTC Derivatives and the 2008 Financial Crisis

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In 2002, Warren Buffet included a warning in his annual letter to the shareholders of Berkshire Hathaway which now seems eerily prophetic: “We view [derivatives] as time bombs, [as] financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal” (12, 14). These hidden dangers were painfully revealed in 2008 and 2009, when the ballooning housing, stock, and mortgage-backed security markets imploded simultaneously, bringing about the worst domestic recession since the Great Depression (“Financial Crisis Response”). Measured from 2006-2009, the “credit crisis” increased unemployment from 4.6% to over 10%, reduced US stock market capitalization by almost \$5 trillion, decreased real gross private investment by a staggering 31.42%, and resulted in the federal government doling out over \$1.1 trillion of aid to prevent the failure of well-established corporations including AIG, JPMorgan Chase, General Motors, and the GSEs Fannie Mae and Freddie Mac (Kolb 261-269). Unraveling the complex series of events that created the financial crisis remains challenging, since “no single cause [of the crisis] can be identified” (Kolb xi). However, one factor lies at the center of this web of causality: over-the-counter, mortgage-backed derivatives. The 2008 financial crisis clearly illustrates how the unregulated over-the-counter (OTC) derivatives market has the inherent tendency and capacity to create securities capable of toppling financial markets.

To begin, it is important to understand the basic types of derivatives and the two different markets in which they are traded. In general, derivatives “are financial instruments whose promised payoffs are derived from the value of something else, generally called the ‘underlying’” (Stulz 173). Furthermore, “The term derivative comes from how the price of these contracts is derived from the price of some underlying commodity, security or index or the

magnitude of some event” (Dodd 1). Derivative contracts are financial instruments with no intrinsic value outside of the worth of an underlying asset; without the support of an underlying, the derivative itself becomes worthless. Additionally, derivatives are often contracts between two parties reflecting a difference of opinion about the future value of the underlying asset. Each member of the contract relies on a “counterparty”, who “is responsible for the other side of the trade” (Zucchi). The financial security of the counterparty is crucial to the validity of the derivative, as contracts are made with the understanding that each counterparty will fulfill his or her obligations. The risk associated with the financial security of the counterparty is called “counterparty risk” and is especially important in the private, over-the-counter derivative market. Before jumping into the two types of derivative markets, however, it is important to understand the most common types of derivatives: options, swaps, and futures and forward contracts.

Options, the first category of derivatives, are defined as a “contract that offers the buyer the right, but not the obligation, to buy (call) or sell (put) a security or other financial asset at an agreed-upon price (the strike price) during a certain period of time or on a specific date (exercise date)” (“Option”). Options demonstrate the two-sided nature of derivative contracts, as the writer of an option believes that the underlying asset will move in the opposite direction of what the option buyer expects. For example, if an investor purchases a call option, which is the right but not the obligation to buy an asset at the strike price, she believes the asset will be worth more than the strike price at the end of the option, allowing the option to be “exercised” for a profit. On the flip-side, the writer of a call option believes the asset will decrease in value, making the option to buy worthless at maturity and allowing the writer to collect fees from the buyer for the privilege of owning the option. Futures and forward contracts rely on this same difference of belief and are designed like options, except this time the contract must be

exercised upon maturity. A forward or future contract “obligates one party to buy the underlying at a fixed price at a certain time in the future, called ‘maturity,’ from a counterparty who is obligated to sell the underlying at that fixed price” (Stulz 174). Both forwards and futures are often used for commodities trading, where the party obligated to buy attempts to lock in a lower price for the commodity than the market price at maturity, while the party obligated to sell hedges risk by ensuring a fixed price even if the commodity value falls in the future. Each party believes the opposite of its counterparty, facilitating the creation of the derivative.

Finally, “A swap is a contract to exchange cash flows over the life of the contract” (Stulz 175), many times based on an interest rate or currency exchange rate. In the case of ‘vanilla’ interest rate swaps, one party exchanges a fixed-interest loan for the variable rate loan of a second party (Stulz 175). The cash flow of payments from one party, then, is directed to the loan held by the other party, giving rise to the term “swap”. Like futures and options, swaps rely on a difference of opinion between two parties about a rate or underlying asset, with each party seeking to exchange positions with its counterparty. Importantly, at the maturity of either a swap, futures contract, or option, one party to the trade “wins” and comes out with a profit, and the other party “loses” and comes out with a loss (or, at best, with less profit than if the contract had not been made). So, at the end of a derivative contract, money or assets are simply shifted from one party to the other. In this way, it is hard to argue that derivatives create economic value; rather, they facilitate the migration of assets from one person to another. As in a poker game, where the money only changes hands, derivatives create wealth for one party by taking it from another.

After understanding the different types of derivatives available, it becomes necessary to define the difference between the over-the-counter derivative (OTC) market and the exchange

traded (ET) derivative market. “Exchange” implies a public, “central market in which all participants can observe the bids, offers and execution prices of all other participants” (Dodd 3). Organizations like the Chicago Mercantile Exchange and Chicago Board of Trade handle a majority of domestic exchange-traded derivatives (Carruthers 387), and basic options on stocks and bonds are available to the average personal investor. Importantly, ET derivatives are “standardized, fungible, and of limited variety . . . [and] the host exchange provides clearing services and allows for price discovery and a high degree of both transparency and regulatory oversight” (Carruthers 386). ET markets benefit from a formalized exchange acting as a third-party “clearing house”, responsible for “settling trading accounts, clearing trades, collecting and maintaining margin monies, regulating delivery and reporting trading data” and “for the fulfillment of the contracts” (“Clearing House”). This places a responsible third party in-between derivative contracts, standardizing trading practices and significantly decreasing counterparty risk.

On the other hand, the over-the-counter market “involves private bilateral transactions that can be uniquely customized to the needs of a corporate client. There is little transparency, no price discovery (the terms of the transaction are not made public), no clearing, and no regulatory oversight” (Carruthers 386). Instead of being traded on a standardized exchange, these OTC derivatives represent a private agreement between two parties, exposing both participants to significant counterparty risk because of the lack of an official clearing house. Without this supervising, organizational clearing house, OTC contracts can fail if either party defaults on his or her obligation because the agreements are made privately. Additionally, OTC markets are “characterized by a very high level of innovation” because “no regulatory approval . . . is necessary in order to introduce into the market a new kind of swap” (Carruthers 394). This precipitates the creation of exotic, complex derivatives based on unstable and oftentimes

ambiguous underlying assets, sometimes even on other derivatives. Counterparty risk, the lack of a clearinghouse or regulatory oversight, and constant innovation make the OTC market far riskier than the ET traded market. Unsurprisingly, it is in the OTC market that the 2008 crisis developed.

Specifically, the combination of two OTC derivatives precipitated the crisis: “single name credit default swap or ‘CDS’ contracts . . . [and] structured financial instruments such as mortgage securitizations and collateralized debt obligations or ‘CDOs’” (Whalen). A collateralized debt obligation “is a new security based on a pool of assets” and a collateralized mortgage obligation, or CMO, “is a particular kind of CDO—one that is based on a pool of mortgages” (Kolb 23). Relying on explanations in the book “The Financial Crisis of Our Time” by Robert Kolb and the video “The Crisis of Credit: Visualized” by Jonathan Jarvis, the creation of a CMO can be imagined as the flow of a river. First, a local bank lends money to a home-buyer as a mortgage. The local bank then sells this mortgage to a large financial intermediary, beginning the flow of the mortgage downstream. The financial intermediary, like Goldman Sachs or JPMorgan Chase, collects hundreds or thousands of these mortgages into a security called a collateralized mortgage obligation, which is divided like a waterfall into different levels, called “tranches”. As mortgage payments flow down the derivative river from homeowners and into the CMO, the money first washes into the “senior tranches” of the CMO, which are considered the safest investment. Once the obligations of the senior tranches are filled, the leftover money trickles farther down the security waterfall, filling the middle “mezzanine” tranches and then the riskiest bottom level, called the “equity” tranche. Each tranche is rated by a rating agency and then sold to investors, with mutual funds and pension funds buying the safest, lower-yielding senior tranches and hedge funds and other speculators purchasing the higher yielding equity tranches. Every step of the process is profitable for every participant.

The local bank sells the mortgage for a profit, the investment bank packages the CMOs for a substantial fee, and final investors benefit from the interest paid by homeowners on their mortgages that floats down the CMO river.

The other type of derivative that created the crisis, the credit default swap, or CDS, acts as an investment insurance policy that transfers the risk of default on a loan or a bond from the buyer of a CDS to the seller of a CDS (Zabel). In a CDS contract, “the buyer of protection agrees to pay premiums to a seller of protection over a set period of time”, while “the seller of protection agrees to pay the buyer an amount of loss created by a ‘credit event’ related to an underlying credit asset (loan or bond)—the most common events are bankruptcy, restructuring or default” (Zabel). To help illustrate, imagine Blake, the manager of a large hedge fund. Blake’s hedge fund recently purchased millions of dollars of bonds and Blake wants to protect himself in case the issuer of the bond defaults on the loan and is unable to repay Blake his principal investment. To hedge his risk, Blake enters into a CDS contract with JPMorgan Chase, who agrees to repay Blake in case of a “credit event” where the bond issuer is unable to make payments. In exchange, Blake pays JPMorgan a fee which becomes pure profit if the credit event never occurs. However, if the event does occur, Blake is protected and JPMorgan becomes responsible for compensating Blake his losses, *swapping* default risk from Blake to the bank.

Beginning in the early 2000’s and leading up to the financial crisis, an important shift in this credit default swap market occurred: banks began writing CDSs on their CDOs (Zabel). As discussed, CDOs and CMOs (which, again, are CDOs backed by mortgages) are simply pools of assets that make regular payments to investors, a process very similar to the interest payments made on standard bonds and loans. Because of this, CDS contracts can be created between parties based on CMOs, with the buyer of protection insuring himself in case home buyers

default on their mortgages and the payments stop trickling into the CMO tranches. This combination of debt obligations and CDSs became a powerful and profitable force for two reasons. First of all, financial intuitions used CDSs to ensure that their CDOs received higher ratings from credit rating agencies like Moody's and Standard and Poor's. Instead of creating a CDO stable enough to actually earn an AAA rating, the highest rating from Standard and Poor's and indicating a highly safe investment, "it often turns out to be much cheaper to effectively rent a higher rating from an AAA firm like the former AIG", which benefited the insurer because "collecting payments from the issuer for the default insurance is free money—as long as the issuer does not default" (Kolb 118). This process makes the CDO "safer" because a seller of protection, like AIG, agrees to cover payments in case the underlying asset of the CDO defaults, leading to a security that more investors purchase because of the perceived security of an AAA rating.

Moreover, CDSs allowed banks and financial intuitions to free up capital. When holding a risky bond or CDO, banks are "required to hold a certain percentage of capital to cover the risk . . . varying with the risk of the bank's investment portfolio" (Kolb 119). The opportunity cost of sidelining this capital in favor of reinvesting it encourages banks to seek an alternative: the CDS. Holding a CDS on these risky investments, which transfers the true risk of the investments to someone else, reduces "the demanded capital from 8 percent of the value of the risky bonds or CDOs to just 1.6 percent" (Kolb 119). Because of this, CDSs allow banks to hold less dead capital collateral against their CDO investments since the bank itself is no longer responsible for the risk of the CDO; the CDS seller now bears this risk. In the end, both CDO creators, who co-opted the creditworthiness of CDS sellers like AIG to garner a higher credit rating, and CDO buyers, who utilized CDSs to free up capital for reinvestment, found

incentives to combine CDOs with CDSs, a noxious cocktail that left the financial markets on the precipice of disaster.

The simplicity of creating these derivatives and the massive profitability of both originating and investing in them led to massive, frightening growth in both the size and complexity of the OTC derivatives market. As Carruthers notes in *The Journal of Comparative Economics*, “. . . in 1986 the total value of exchange-traded derivatives was more than the total value of OTC derivatives, [but] by 2008 the total value of OTC had become ten times greater, despite the fact that the exchange-traded market had grown 100-fold” (391). The OTC market grew to a notional value of over \$450 trillion by 2008, skyrocketing more than nine fold from just ten years earlier (Carruthers 391). Large financial institutions controlled much of the growth, as JPMorgan Chase increased OTC derivatives holdings by 400% to over \$80 billion from 2001-2008 and CitiBank and Bank of America grew OTC holdings from \$5 billion to \$32 billion and \$8 billion to \$35 billion, respectively, during the same time (Carruthers 391). At the same time, by 2007 and only 11 years after its creation in 1997, “the CDS market had a notional value of \$45 trillion, but the corporate bond, municipal bond, and structured investment vehicles market totaled less than \$25 trillion”, implying that “a minimum of \$20 trillion were speculative ‘bets’ on the possibility of a credit event of a specific credit asset not owned by either party to the CDS contract” (Zabel). The former AIG sold massive amounts of credit protection, in the form of CDSs, eventually holding “\$527 billion worth of risky debt” by 2007, with “much of this debt being in the form of CDOs backed by home mortgages” (Kolb 119).

Because of this massive growth in both the swap market and the entire OTC market, complex, unclear, and risky derivatives developed. The CDS market developed tangled interrelationships, with “Some CDS contracts . . . [passing] through 10-12 different parties” (Zabel), making it nearly impossible to decipher liability in the case of a credit event. Financial

institutions also created synthetic CDOs, a process where firms repackage pieces of other CDOs and credit default swaps that reference tranches of other CDO's into new CDO's that hold little or no real assets themselves (McLean, Nocera 263-266). These newly created synthetic CDOs derived their value from other CDOs and CDSs instead of tangible assets; the process layered derivatives upon derivatives. Frighteningly, synthetic CDOs “existed solely to make complex bets on securities that existed somewhere else in the system (which, as often as not, were themselves bets on securities that existed somewhere else in the system)” (McLean, Nocera 267-268). In short, the OTC derivatives market became a cobweb of securities, “a tangled hairball of risk” (Janet Tavakoli, qtd. in Mclean, Nocera 313), with CDOs based on other CDOs made up of other CDOs, ad infinitum. Without regulatory oversight, nothing but a lack of creativity could prevent the conception of new and ever more complex derivatives. And, unfortunately, the financial industry is never at a loss for ingenuity.

With all of the discussion about synthetic CDOs and the complexity of the OTC market, it is easy to forget the main underlying of these complex securities: mortgages. And, as it turns out, these underlying mortgages were far from safe. Driven by an artificially low interest rate environment and increasing demand from investors for more CDOs, local banks began giving mortgages to high-risk homebuyers with low credit scores, oftentimes without proof of income or a down-payment (Jarvis). These mortgages, called “subprime” mortgages, were immediately sold, for a profit, to a larger financial institution who quickly packaged the mortgages into CMOs, insured with CDSs, which were then sold to the final investors (or sometimes purchased by the financial institutions themselves). All along the way, the risk of these subprime mortgages was passed along down the CDO river, so banks continued writing subprime mortgages and financial institutions continued packaging them into CMOs; the process was simply too profitable to stop. Eventually, “subprime mortgage originations

accounted for 25.7 and 31.0 percent of all new mortgages in 2005 and 2006, respectively” (Kolb 52), and “By 2007 subprime . . . mortgages accounted for 25 percent of all mortgage securitizations” (Kolb 46). This put the entire cobweb of CDOs and CDSs, based in one way or another on these subprime mortgages, at severe risk.

Inevitably, this risk ballooned into a catastrophe. “By the second quarter of 2008, almost 4.5 percent of all mortgages were in foreclosure”, after never exceeding .4% before 2000 (Kolb 61). Consequently, “The failure of mortgages to pay as promised made the mortgage-backed security constructed from these nonpaying mortgages less valuable” (Kolb 62), leaving financial institutions with “losses [that] devastated the reported earnings of firms . . . leaving them with a diminished capital position” (Kolb 62). One massive firm in particular, Lehman Brothers, filed for bankruptcy on September 14, 2008, which “set off a derivatives chain reaction affecting Lehman’s counterparties and directly caused the credit crisis” (Hera). This chain reaction reverberated across the financial industry, resulting in massive losses for the final investors in the CDOs and leaving many investors demanding payments from firms that sold insurance as CDSs. However, the firms selling the swaps, who were responsible for covering losses as per the contract, had nowhere near enough collateral to cover the escalating claims: “In simple terms, as the risk of higher subprime mortgage defaults increased in the CDOs, the credit default swap values decreased due to the risk of anticipated higher pay-outs by the CDS seller” (Zabel).

In conjunction with this issue, recall the synthetic CDOs and the multilayered derivatives concocted by derivative creators. As some CDOs and CDSs plummeted in value, the effect cascaded across all the other CDOs and CDSs based on the original securities, accelerating the effects across the entire OTC market. For firms trying to sell CDOs, “the market . . . was falling away beneath their feet” (Kolb 63), as investors riddled with losses

refused to invest anymore, bringing the market to a stand-still. In summary, all across the market, money stopped flowing into CDOs due to defaults, investors stopped buying the securities, firms holding the credit responsibility in the form of CDSs could not pay, and, initiated by the failure of Lehman Brothers, the complex fabric of layered derivatives amplified initial CDO losses. The OTC market, all the financial institutions involved in creating it, and all the hedge, mutual, and pension funds that invested in it collapsed. And thus the “Great Recession” was born.

While placing blame for the recession solely on the OTC market may oversimplify the issue, it becomes clear that unregulated and highly complex OTC derivatives lay at the center of the crisis. As Rona Hera notes in his article for the *Business Insider*, “the underlying systemic risk, and the primary reason for the ‘too big to fail’ doctrine whereby governments were compelled to save financial institutions at any cost, lies in over the counter (OTC) derivatives.” It is possible to condemn the OTC market in this way for three reasons. First of all, the creation of highly profitable CDOs incentivized banks to initiate subprime mortgages. Because the mortgages were immediately sold down the CDO river, the risk of the mortgages became irrelevant to the intermediary institutions; in this way, CDOs actually catalyzed their own collapse. Second, CDSs were utilized to lower the requirements for holding capital collateral and to unfairly earn a higher credit rating on CDOs.. This served to hide the true risk of the created securities and allowed firms selling CDS protection to create swaps that they could never insure, creating a ticking time bomb of swaps in the case of defaults. Ironically, CDSs were used to mask the risk that circled around and destroyed the swaps themselves. Third, and most importantly, the lack of regulation in the OTC market permitted firms to layer derivatives into synthetic CDOs with no asset holdings themselves and to package parts of CDOs and CDSs into other CDOs. This eventually created a domino effect that grossly

amplified the damage caused by subprime defaults. Ultimately, OTC derivatives created, propagated, and concealed the risks of the mortgage-backed security market and therefore must bear a majority of the responsibility for the collapse.

In the end, the structural features of the OTC market itself, including a lack of regulatory oversight, heightened counterparty risk due to the absence of a third party clearinghouse to stand in the middle of transactions, and the endless number of possible derivative creations paved the way for the dubious practices that initiated the 2008 crisis. In recognition of these problems, Congress passed the *Dodd-Frank Wall Street Reform and Consumer Protection Act* in 2010, which began an effort to “reduce systemic risk through mandating central clearing of previously unregulated derivative instruments, and by requiring more capital and liquid collateral to back derivative trades” (“Dodd-Frank” 1). However, the Dodd-Frank Act allows firms to opt-out of many clearing activities and excludes “non-financial” firms and many types of derivatives from oversight (“Dodd-Frank” 4-5). Despite these excellent preliminary efforts, the notional value of the OTC market still stands at over \$600 trillion (Hera), exposing the market to the possibility of another bubble, especially given the creativity of derivative writers. When considered in its entirety, the OTC derivative market environment incites speculation, complexity, and opacity, putting the financial industry perpetually on the precipice of a disaster. Without further regulatory oversight and a complete movement towards public, cleared exchanges, the possibility remains for a repeat of the Great Recession. Until then, the OTC market, as Warren Buffet realized in 2002, will remain inherently capable of ballooning into an untamable, explosive financial weapon of mass destruction.

Works Cited

- Buffet, Warren. "Chairman's Letter." Letter to the Shareholders of Berkshire Hathaway. 21 Feb. 2003. Berkshire Hathaway, 21 Feb. 2003. Web. 2 May 2014.
- Carruthers, Bruce G. "Diverging Derivatives: Law, Governance and Modern Financial Markets." *Journal of Comparative Economics* 41.2 (May 2013): 386-400. *ScienceDirect*. Web. 2 May 2014.
- "Clearing House." *Investopedia*. Investopedia US, n.d. Web. 2 May 2014.
- "Dodd-Frank's Title VII — OTC Derivatives Reform." *Ernst & Young*. Ernst & Young Global Limited, 2013. Web. 2 May 2014.
- Dodd, Randall. "The Structure of OTC Derivative Markets." *The Financier* 9 (2002): 1-4. *FinancialPolicy.org*. Web. 2 May 2014.
- "The Financial Crisis Response: In Charts." *Treasury.gov*. The Department of the Treasury, Apr. 2012. Web. 2 May 2014.
- Hera, Ron. "Forget About Housing, The Real Cause Of The Crisis Was OTC Derivatives." *Business Insider: Finance*. Business Insider Inc., 11 May 2010. Web. 2 May 2014.
- Jarvis, Jonathan. "The Crisis of Credit: Visualized." Online video clip. *YouTube*. YouTube, 22 Jan. 2011. Web. 5 May 2014.
- Kolb, Robert W. *The Financial Crisis of Our Time*. New York: Oxford UP, 2011. Print.
- McLean, Bethany, and Joseph Nocera. *All the Devils Are Here: The Hidden History of the Financial Crisis*. New York: Portfolio/Penguin, 2010. Print.
- "Option." *Investopedia*. Investopedia US, n.d. Web. 2 May 2014.
- Stulz, René M. "Should We Fear Derivatives?" *The Journal of Economic Perspectives* 18.3 (Summer 2004): 173-92. *JSTOR*. Web. 2 May 2014.

Zabel, Richard R. "Credit Default Swaps: From Protection to Speculation." *Robins, Kaplan, Miller & Ciresi*. Robins, Kaplan, Miller & Ciresi LLP, Sept. 2008. Web. 2 May 2014.

Zucchi, Kristina. "Derivatives 101." *Investopedia*. Investopedia US, 29 Jan. 2009. Web. 2 May 2014.