

2. Outline and assess the role of financial derivatives and the institutions that created and held them in the financial crisis of 2007–09. Hence, discuss the implications for regulatory reform of derivatives contracts, the markets in which they are traded and the participating financial institutions

Introduction

This paper is divided into two sections. The first section is split into sub-sections; A, B and C, outlining the role of three derivatives in the lead up to the crisis. Section two introduces several regulatory proposals present in the literature. This paper attempts to balance the views of several authors, often with contrasting ideas regarding the same proposals.

Section One: The recent financial crisis – role of main derivatives and institutions

This section will briefly summarise three of the main bond derivative contracts that may have played a role in the recent financial crisis of 2007-09; CDOs (and securitisation more generally), credit default swaps (CDS) and repurchase agreements (REPOs).

A. CDOs

Securitisation is the process of offloading risk from a bank's balance sheet by pooling together various loans (often mortgages) and packaging them together. In the lead up to the crisis these packaged mortgage bundles were often made up of subprime and alt-A mortgages – that is individuals who are of high default risk. The bundles were then transferred to a separate entity called a special purpose vehicle (SPV) or structured investment vehicle (SIV) that was set up for this sole purpose. The most common of these asset-backed securities (ABS) is collateralised debt obligations (CDOs). ABS as a market rose

in value from \$0.1trillion in 1990 to over \$1.6trillion in 2006 (page 271, G&M 2010). CDOs are divided into different 'tranches' in order of default risk, with the top 'senior' tranche usually rated AAA and considered reasonably safe and the bottom 'toxic waste' tranche unrated by the agencies and very risky. Investors in each tranche receive their investment back only when higher tranche holders have received theirs.

One problem with offloading risk from the bank to other parties through securitisation is that without the bank bearing any of the risk, they have less incentive to lend responsibly (page 7, Brunnermeier 2008).

The various tranches available to investors provide a range of investment opportunities for investors across all risk tolerance and preference levels. The structured nature of CDOs also allowed institutions such as money market mutual funds (MMMFs) to invest in senior tranches made of several lower-rated loans - they could previously only invest in AAA rated bonds.

The agencies rating these securities have been criticised since the crisis. Moody's, Standard & Poor's and Fitch operate in a three-way oligopolistic market, competing against one another. Since it is the institutions originating the securities that pay the agencies for ratings, there may be a conflict of interests which has led to favourable ratings on structured securities such as CDOs. The complexity of CDOs and other ABS meant that any inflated ratings were more difficult to spot than with plain "vanilla" bonds (page 15-16, White 2010). The possibility of inflated ratings was increased by the market structure of the agencies, which are competing against one another for the custom of institutions originating securities. "Ratings shopping" for the best rating became an issue (page 86, Bolton et al 2012).

B. CDS

A CDS is an insurance contract for the owner of a particular bond or tranche of CDO, to buy to protect his or her self from the event of default. The 'buyer' of the CDS makes regular payments to the 'seller' until the underlying asset (bond or CDO tranche) matures. The seller pays nothing unless the underlying asset defaults – this is known as a 'credit event'. In this instance the seller makes a one-off payment to the buyer.¹

Brunnermeier (2008) argues that investors with a position in a senior tranche of a CDO (rated AAA), that were also purchasing a CDS to further protect against default, had reason to believe this was a safe investment (page 4).

However, in the years leading up to the crisis, CDSs were increasingly bought by investors who did not own the underlying asset in the contract, and so were essentially betting that the bond would default in order to receive a pay out from the seller. This is known as 'naked CDS'.

There are three main risks connected with CDS. Firstly 'credit risk', the most obvious risk that one party defaults on the agreement, so the buyer fails to make payments to the seller for example. The second is 'funding risk' where the buyer cannot make the good faith deposit, a form of insurance premium paid to begin with to protect the seller. The final form of risk associated with CDS is 'market risk', which is out of the control of the two parties. Falling housing prices are widely regarded as the trigger for the crisis, and as the CDOs for which the CDS were purchased upon were made up of subprime mortgages which defaulted at an alarming rate to begin the crisis, CDS was very much open to market risk.

¹ EC372 Topic 8 Note on Credit Default Swaps

C. REPO

Pension funds, mutual funds and other such entities saw growth in the amount of money they were managing as securitisation rose to prominence in the early 2000s, and these institutions demanded a safe investment for their cash that provided some return but was still highly liquid. This was a key driver of the REPO market at the beginning of the 21st century (section I.C, G&M 2010). A repurchase agreement (REPO) is when an investor purchases an asset from another in exchange for payment, with the agreement to reverse the deal at a later date for a later fee, all agreed in the original contract. The 'haircut' on the REPO is the difference between the market value of the asset on collateral and the purchase price of the REPO agreement – this provides the selling party with insurance.

One key advantage of REPO agreements is the exemption from chapter 11 bankruptcy. Investors in a REPO agreement reserve the right to terminate the agreement when the opposite party becomes insolvent, so for investors in REPO agreements with banks, they are able to terminate the agreement if they become worried about that bank's solvency (page 276-277, G&M 2010).

This is an advantage for investors, however this liquid characteristic of REPO agreements opens the market to a possible 'run', and this proved to be the case in the crisis, with a 'run on repo'. Investors feared banks' insolvency and quickly sold collateral at a large scale, which in turn caused investors to increase haircuts (page 279, G&M 2010).

Most REPO agreements also include a third party – an intermediary or 'clearing bank', who matches the two, parties together and facilitates the transaction. The two 'clearing banks' in the US are JP Morgan Chase and Bank of New York Mellon. The 'clearing bank' is not exposed to the transaction risks, but can become vulnerable if the value of collateral falls

below the amount owed to it from the two parties. As collateral was sold quickly, the value of it did fall, and the two 'clearing banks' in the US became exposed (page 6, Copeland et al).

Another problem with the REPO market is the difficulty in valuing it accurately. The collateral received in a REPO transaction can then be reused again in another transaction – this is called rehypothecation. The extent to which rehypothecation exists is unknown, so the REPO market is impossible to measure accurately. This being said, BIS economists Peter Hördahl and Michael King report that the US market was worth \$10trillion at the end of 2007 (page 278, G&M 2010).

Section two: Regulation

This section will briefly outline the objectives of effective regulation, before analysing several regulatory proposals from the literature, drawing on the objectives outlined.

The three objectives of regulation used here are those outlined in EC372 Topic 8 notes.

Firstly, regulation aims to ensure that financial intermediation assists, and does not hinder, economic performance in the non-financial sector. Therefore, it aims to provide an environment for economic growth and other key indicators.

Secondly, regulation should support state law and reflect an open and honest hand of rule.

Regulation should be transparent and open to the public to see, and no criminal activities should be allowed, nor should dis-honest operations within financial intermediaries or markets.

Finally, regulation should be punitive to those restricting competition between banks by extracting gain from the guilty parties, this is 'regulatory capture'.

To summarise from section one, the main derivatives discussed were CDOs, CDS and REPO. CDOs may need some regulation to make them more transparent, as the complexity has led to investors not knowing much of what they are trading in. CDOs also relied heavily on steady upward trend in house prices, so the institutions issuing the loans and mortgages may need to take more care in who they lend to. With CDS it was apparent that these were used more as a speculative instrument than the insurance contracts they were designed to perform as – through the growth of ‘naked CDS’. The market for CDS also relies heavily on responsible behaviour by financial institutions, as the CDS contracts specify an underlying asset which is often a tranche of a CDO. REPO appeared to be a highly complex market which was difficult to value due to rehypothecation. Fear of bank insolvency led to a ‘run on repo’ in the midst of the crisis, as REPO holders feared that the institution on the other side of the agreement may become insolvent, and many investors exercised their right to terminate the contract- leading to increased haircuts.

One large problem outlined in Lo (2012) is the ‘too big to fail’ issue. Failure of a large interconnected financial institution can affect negatively the domestic and even world economy, so this is a major concern for regulators, as we highlighted in the first objective of regulation. Subsequently, banks may realise their strong position and abuse that power by behaving irresponsibly, knowing that governments will bail them out if they fail. Johnson and Kwak (2010)² suggest removing this ‘too big to fail’ problem by breaking up the banks, to reduce their power within the financial economy and remove this implicit ‘promise’. Roubini and Mihm (2010)² agree with this regulatory proposal, claiming it could be done

² Three references indirectly from Lo (2012):

Johnson & Kwak: ‘13 Bankers: The Wall Street Crash and the Next Financial Meltdown’ (2010)

Roubini & Mihm: ‘Crisis Economics: A Crash Course in the Future of Finance’ (2010)

Rajan: ‘Fault Lines: How Hidden Fractures Still Threaten the World Economy’ (2010)

through either new legislation, or left to antitrust authorities like most anti-competitive markets. Rajan (2010)² also acknowledges the 'too big to fail' problem, but disagrees with J&K and R&M, suggesting restricting size of banks is too crude is ineffective. Rajan instead suggests removing the promise to bail them out and transferring the risk to the institutions themselves. Antitrust authorities should perhaps consider the competitiveness of large financial institutions if they have the power to act irresponsibly.

A commonly debated topic in bank regulation is whether one bank should be allowed to operate as both a commercial and investment bank. In 1933, Carter Glass argued that the conflicts of interest that arise from operating in both sectors makes separation of the two areas in the public interest and thus the Glass-Steagall Act was introduced, outlawing universal banks (page 810, Kroszner and Rajan 1994). This was repealed in 1999, but Rajan (2010) and R&M (2010) believe it should be brought back in even stronger form following the crisis of 2007-09 (page 164-165, Lo 2012). Lo (2012) comments that although Roubini and Mihm offer reasons for the return of the Glass-Steagall Act, they avoid the difficult questions over how it would be implemented. In contrast, Kroszner and Rajan (1994) show empirically in their study of the U.S pre-1933, universal banks performed better than independent investment banks, offering support to the repeal of the Glass-Steagall Act that followed five years on. It therefore appears that even with the same author present in both papers (Raghuram Rajan), assessment of two different time periods can provide differing conclusions over whether commercial and investment banking should be separate.

Highlighted in G&M (2010) is the issue of MMMFs explicitly promising \$1 per share for investors, with no outlay for the MMMF itself. This free insurance provides MMMFs with a cost-advantage over banks that pay for deposit insurance and may have led them to act

even more irresponsibly than banks did (page 270, G&M 2010). Subsequently, as part of the run on short-term debt, MMMFs experienced a net cash outflow of \$234billion in the last three months of 2008 (page 280, G&M 2010). The Group of Thirty Proposal suggests removing this guarantee, or make MMMFs pay for deposit insurance – Gorton and Metrick (2010) agree with this proposal. However, implementing this regulation appears difficult, as Gorton and Metrick (2010) note that an industry worth \$4trillion may have some say in losing its main cost-advantage over rival investment lobbies. MMMFs grew from holding \$4billion in liabilities in the 1970s to around \$3.8trillion at their peak in 2008 (page 269, G&M 2010).

Another form of short-term debt that experienced a ‘run’ was the REPO market, as discussed in section one. Gorton and Metrick (2010) highlight REPO as an important area for regulation, alongside securitisation and MMMFs. G&M propose allowing banks to operate in the REPO market using only US treasury securities and liabilities of the Narrow Funding Banks for which they suggest are introduced throughout the paper (special purpose banks that control and regulate securitisation in general). Non-banks may operate if they obtain a license, and may use any type of security as collateral, but there would be minimum haircuts, which in turn would limit the extent of rehypothecation (page 287, G&M 2010).

G&M do acknowledge however that minimum haircuts would not prevent *all* runs on REPO.

Finally, with a large proportion of blame pointed at credit rating agencies for inflated ratings of CDOs, there is an argument to regulate these more strictly. Bolton et al (2012) proposes up-front fees from institutions to CRAs to eliminate the possibility of ‘ratings shopping’ and recommends these ratings be made public immediately. However, White (2010) claims that any regulation in the securitisation industry may stifle innovation; this is always the problem

with regulatory proposals and if it leads to reduced economic growth it may be violating the first objective of regulation outlined at the beginning of section two.

Conclusion

In section one three derivatives were briefly described and explained. This section discussed the advantages and disadvantages of CDOs, CDS and REPO, and outlined their contribution to the crisis. It was found that securitisation was the result of increased innovation which allowed banks to offload risk from their balance sheets, but this transfer of risk may have led to irresponsible lending from banks to subprime mortgage borrowers. The complexity of CDOs made them difficult to value and rate, and investors treated AAA-rated tranches of CDOs like they were AAA-rated treasury securities, but in reality tranches were 'rated on the edge'. CDS were increasingly used for speculation rather than to protect against CDO default and REPO contracts were subject to a run on the market due to their exemption from chapter 11 bankruptcy. Rehypothecation also made REPO markets difficult to accurately value. All three of the derivatives were open to market risk, and with housing prices assumed to consistently rise over time and CDO contracts backed by highly correlated and poorly packaged subprime mortgages a fall in the housing market sparked a run on all forms of short-term debt.

Therefore arguments arose as to how to effectively regulate the derivatives contracts, the markets in which they operate and the institutions that participate, keeping in mind the objectives of effective regulation. Section two outlined these objectives and discussed then evaluated several proposals that appear in the literature. The key problems being addressed were the opaqueness of modern banking, the issue of 'too big to fail' banks and whether the Glass-Steagall Act should re-emerge to reduce conflicts of interest in universal banks. What

appeared clear from all of section two was that depending on the individual's point of view, the best response by authorities can wildly vary. As highlighted by Lo (2012) in his introduction, there is no single root cause of the crisis, and there is no single set of regulation that has been agreed to be the ideal solution. The overall objective should be to use what we have learnt from the crisis to avoid similar events in the future. The overriding feeling appears to be that institutions should be held more accountable for their actions and Roubini and Mihm (2010) also suggest proactively defusing housing bubbles, but do not explain how.

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