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Structured Credit: Dominoes and Dynamite

Barrie Wilkinson and Andy McGee, Partners in Oliver Wyman, say that structured credit has become a dirty term in the financial services industry. Mortgage-backed Securities (MBS) and Collateralised Debt Obligations (CDO) were at the heart of the sub-prime crisis in 2007, and individual credit derivatives and guarantees that exist between the various players are now prolonging and deepening the crisis during 2008. The different forms of arbitrage developed through structured credit technology have enabled banks to operate with leverage never seen before. Regulatory arbitrage allowed banks to transfer risk-weighted assets from their balance sheets without transferring a commensurate level of risk and this in turn allowed banks to take on more risk without the need for more capital. Rating arbitrage, made famous through CDO technology, allowed banks to transform BBB instruments into AAA instruments with the wave of a magic wand. By holding assets in complex off-balance sheet vehicles, banks were able to give the appearance that their leverage ratios were in line with historical levels while, in reality, the downside risk associated with these assets remained with the bank.

The growth of the credit derivative swap (CDS) market has meant that the failure of one bank can lead to a domino effect with almost every major financial institution affected either directly or indirectly. CDS contracts have allowed banks to take on greater exposure to underlying loans and bonds on the assumption that the net risk (after accounting for the risk-mitigating effects of any CDS protection) was manageable. In reality, many of these hedges are no longer worth the paper they are written on as the counterparties that wrote the protection do not have sufficient capital to meet all of their obligations. The most obvious example of this are the monoline insurers who wrote many hundreds of billions of dollars of credit protection with only a small fraction of this amount held as capital to support any potential claims. It is comparable to a game of musical chairs: only when the music stops is it apparent that there are not enough seats for everybody.

This paper aims to identify the inherent weaknesses in the structured credit market as it has developed over time and offers possible ways forward for those products least susceptible to such weaknesses. It will also hopefully assist the reader to see through the economic fog that has obscured the underlying problems within the market.

The rise and fall of structured credit

It is important to recognise that the development of structured credit was driven by several fundamental benefits it provided – albeit theoretically – to the financial system:

- *Enhanced diversification of risk within the financial system:* The advent of structured credit allowed assets that would otherwise have remained on bank/financial service company balance sheets to be sold to the broader market. This commercial activity allowed financial institutions to reduce their concentrations to specific asset classes, whilst placing the assets with the broader investor set who could better diversify them with the broader market portfolio
- *Improved liquidity, and broadened investment and hedging opportunities:* The advent of the CDS market, which was structurally more liquid than the cash bond and loan markets, dramatically improved the ability of banks to understand the market price of credit. In addition, by establishing a two-way market it created the opportunity for banks to hedge their structural risks. CDOs and the associated indices (Itraax and

CDX) made it possible to trade, hedge and bet on correlations, thereby giving practitioners the ability to measure, monitor and mitigate systematic risk in credit portfolios

While the fundamentals for the development of structured credit were positive, in recent years, a number of shortcomings were revealed, five of which in particular played a key role in the subsequent failure:

- *Limited data* contributed to the market and the rating agencies' dramatic underestimation of the risk in many instruments
- *Moral hazard*, which was significant and poorly controlled, thus exacerbating this underestimation
- *Re-securitisation* concentrated the risk among a small number of players rather than spreading the risk across the broader market
- *Counterparty risk* created a complex web of interdependencies across the market leading to increased systematic risk
- *Systematic risk* increased further with the failure of pricing and the resultant moral hazard

Limited data

The dramatic growth of the structured credit market corresponded with a period of relatively benign experience in many of the asset classes (especially mortgage and commercial real estate) that underlie the securities. As such, rating agency and market participant models were unable to anticipate the potential for loss since they were built on data from these benign periods. For example, few models could anticipate the impact of negative home price appreciation since it had not been seen during the period of model development. The many good years of performance within the structured asset classes (which in fact provided very little indication of the true risk) suggested that possible losses would be similarly low on a forward-looking basis.

Moral hazard

The underestimation of risk was greatly exacerbated by three sources of moral hazard within the system. Firstly, the separation between originators and risk holders led to a general decline in underwriting standards. As long as a risk factor was not taken into account within the agency models or by investors, originators had little incentive to include this factor in underwriting standards. Economic theory suggested that the relative performance of the

different securities would be a control for moral hazard and that the market would punish those issuers and mortgage originators with a poor performance track record. This assumption turned out to be wide of the mark: performance could only be observed once the crisis was well under way, and the consequence was a collapse of the entire market rather than individual under-performing managers. Secondly, while securitisers clearly had incentives to argue down subordination levels, given the importance of structured credit to their business models, rating agencies did not have the right incentive to hold a firm line.

Re-securitisation

The third major source of failure was the ultimate concentration of risk facilitated by re-securitisation. A good illustration of this is CDOs of asset-backed securities (ABS). In the past few years, these re-securitisations became popular outlets for certain tranches of MBS and other securitisations and the ABS CDO market became increasingly concentrated in mortgages. At the same time, banks began to hold increasingly large portions of the AAA tranches of their own securitisations' risks which would have been more costly or more difficult to sell on to the market. This development meant that a great deal of confidence was attributed to the belief that the AAA rating assigned to these securities was correct. It is now apparent that the assumptions underlying these rating models were seriously flawed. Not only was the risk of the underlying mortgage collateral underestimated but, perhaps more seriously, the models also massively underestimated the degree of correlation across investments. As it turned out, it *was* a possibility that all investments in the portfolios could lose their value simultaneously. Investment banks that were structuring the deals had their own models, but these tended to include only minor variations of the same agency methodologies and parameters.

As liquidity continued to flood the market and volumes grew, the proportion of business driven by rating agency model arbitrage and spread hunting increased. Instead of creating a more efficient allocation of risk across the market, these processes merely divided up the same risk (with the extraction of several layers of fees along the way).

Banks that opted to hold onto a large piece of the AAA risk at low spreads, or the risky first loss tranches, violated the fundamental purpose of getting such risk diversified in the market.

Counterparty risk

Pushing greater credit risk exposure onto end investors through derivatives contracts without an exchange or clearing house created significant counterparty risk and therefore new sources of systematic risk. Only a small number of banks acted as counterparties for a large portion of the credit derivatives market, which created massive inter-linkages across the system.

The spectre of counterparty risk has haunted financial markets particularly since the collapse of Lehman Brothers. The CDS market is particularly vulnerable to counterparty risk due to the existence of “wrong way risk” which captures the risk where the probability of a counterparty defaulting increases as the exposure to that counterparty increases. By way of illustration, take the scenario of buying credit protection on Goldman Sachs from Morgan Stanley. Clearly there is a good chance that if Goldman Sachs defaults, the claimant will fail to recover its money from Morgan Stanley since the fate of Morgan Stanley is in some part driven by the survival of Goldman Sachs. In fact, this example is not as unlikely as it might seem, since the vast majority of CDS contracts are underwritten by only a small number of financial institutions whose fates are inextricably linked. While the trillions of dollars of CDS exposures net down to something more reasonable once the effects of netting and collateral agreements have been taken into account, there remains a general sense that the degree of systemic risk in the system is still beyond a desirable level.

The main initiatives currently underway to address this issue focus on migrating existing bilateral CDS trades onto an exchange-traded platform. Under such an approach, the exchange would act as a single counterparty for all trades, thus vastly reducing systemic risk through the existence of daily margin calls and multi-lateral netting. Another way to reduce inter-bank derivatives exposures would be to force banks to fully collateralise any mark-to-market (MTM) exposures as they emerge. Banks already force hedge funds to post collateral to cover any derivatives exposures, but banks appear to have been happy to build up unsecured exposures to other banks. If an inter-bank derivative exposure exceeds a pre-defined collateral threshold (typically around \$100 MM), a bank would be forced to post collateral and only for the portion of the exposure that exceeds the threshold. These thresholds are generally in place to avoid the administrative headache of posting collateral

for every minor movement in the MTM of the various trades between banks. Having been burnt by large counterparty losses on events such as the Lehman default, banks may now feel that the increased administrative burden is a small price to pay and therefore opt to reduce these thresholds to zero.

Systematic risk

All four of the above market failings have had the effect of increasing systematic risk in the underlying markets. Because the security market was not able to systematically price for risk or to control market hazard, the primary markets responded by originating increasingly riskier loans. The increased supply of loans in turn drove up prices in underlying asset markets (e.g. home prices, commercial real estate and private equity targets) which, when the system unwound, exacerbated the size of the damage. Finally, by failing to distribute much of the risk, systematic risk was concentrated in a smaller number of institutions, many of which have recently teetered on the brink of collapse. At the time of writing, this threat appears to have been brought under control by massive government-backed bailout programs. The recent recapitalisation and part-nationalisation of large chunks of the global banking industry appears to have been the only way to stop the rot that has threatened to destroy the banking industry.

Which parts of the market are likely to survive?

Firstly, it is important not to throw the baby out with the bath water: not all of the products in the market contributed to the crisis. At one end of the spectrum there were instruments like CDO-squares that had an unfathomable complexity and rested on poorly-founded assumptions. At the other end of the spectrum is plain vanilla CDS, which is a relatively transparent market that has sustained its volumes during the credit crunch due to the need to hedge-out name-level exposures and counterparty risk. Even these simpler instruments suffered from massive underpricing, however, since they were often repackaged into synthetic CDOs in order to tap into demand for yield from AAA investors.

So, which of the various types of structured credit instruments have a future? In general, we believe that the future viability of the various instruments depends on the following tests:

- Is the instrument sufficiently *transparent* to enable investors to take their own view on the risks and markets to determine a value for the instrument during periods of stress?
- Does the instrument serve a *valuable purpose* beyond arbitraging regulations or the creation of fees from repackaging?
- Is the end-to-end process free from *moral hazard*?

Those markets with the longest track records – such as the MBS market – are likely to survive into the future. The MBS market serves a valuable purpose: it funds pools of mortgage assets and transforms illiquid mortgage collateral into one of the most liquid asset classes in the world. MBS instruments have a long history of credit and prepayment behaviour to enable investors to take a view on the risks involved. Now that these markets have experienced a significant downturn, data exists to better evaluate and correctly price the risks involved in many of these loans. That said, the size of the MBS markets (outside of the US Agency MBS market) is likely to shrink substantially. The recognition of significantly higher risk in sub-prime and Alt-A loans will continue to drive primary markets to re-price risk, strengthen underwriting and ultimately reduce supply. In addition, the re-emergence of this market will require better mechanisms to deal with moral hazard, and may ultimately require greater risk retention by the originator.

The CDO and collateralised loan obligation (CLO) markets are the markets that are likely to undergo the greatest contraction. CDO technology aims to transform collateral of a certain credit quality (e.g. a portfolio of BBB bonds) into a series of tranches with ratings ranging from AAA down to an unrated equity tranche. This transformation can only be made possible if the underlying assets have a low degree of correlation. The investment grade CDO bondholders are generally unaffected unless almost all underlying bonds default simultaneously, which is highly unlikely if the correlation between the assets is low. However, only a small subset of the collateral used in the CDO market passed the low correlation test. Investment grade corporate loans, by contrast, pass this test because high quality corporates tend to default for different reasons and their high credit quality ensures that they are unlikely to all default at the same time.

Any assets with lower credit quality, such as leveraged loans and sub-investment grade loans, tend to have more equity-like characteristics which means that they usually have much higher

correlations between them, particularly during a downturn. It is more difficult to effectively structure investment grade CDO classes using such underlying assets and to give investors certainty about limited risk. Given these realities, the originate-to-distribute leveraged loan CDO market is unlikely to re-emerge. However, bespoke CDOs that meet a clear business purpose with risk retention by the securitisers (such as CLOs used to diversify bank balance sheets) are likely to re-emerge.

When CDO technology was extended to the repackaging of MBS/ABS collateral the assumption of low correlation broke down dramatically. The chance of two corporate borrowers defaulting simultaneously is low because the fate of both companies can be driven by firm-specific factors such as strategy, management quality and business mix. The default risk of two BBB MBS bonds, however, is driven by a common systematic variable – property values. All of the specific risk has already been diversified away by the underlying MBS structure, thereby leaving only systematic risk behind at the second stage of re-securitisation. In short, when one of the BBB MBS bond defaults, the rest go with it – even the senior-most CDO investor (super-AAA) can be left with nothing. As such, most CDOs of structured finance instruments (MBS, CMBS, etc.) will disappear in the future. Diversified ABS CDOs with limited concentrations in any one asset class (which is where the ABS CDO market began) may re-emerge, but significantly smaller in size.

Conclusion

The recent crisis has revealed that the entire structured credit market was built on shaky foundations and the whole market has now collapsed. Even if some of the issues raised in this paper can be addressed, it seems clear that the structured credit market will clearly never again reach the heights seen in recent years. As with the bursting of the internet bubble, we now understand the limitations of structured credit technology and it has become apparent that what is required is a reappraisal of what this technology can realistically deliver. We will also need to revise our view that certain applications of structured technology are inappropriate. As with the invention of dynamite, we have learnt that useful tools can be dangerous when in the wrong hands.

As discussed above, some of the more exotic uses of the technology are likely to become permanently redundant. The markets that do survive the crisis are likely to be based upon the

use of simple and transparent technology that has much less potential for the generation of large fees for the players in the market. Market development will also be largely on hold until the market calms and the appetite for credit risk returns.

Finally, opaque strategies that aim to maximise short-term gains while creating large downside risks will likely be stamped out by stakeholders, most notably financial regulators and diligent board members. Those players wishing to survive will need to adapt their approach to a much harsher market and regulatory environment where only true value creation will be rewarded.

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