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## The Role of Data in a Financial Crisis

This first chapter serves to provide context for the rest of the book – setting out the causes of the 2007–2008 Financial Crisis (the Financial Crisis) that swept the global financial markets well over a decade ago and has substantially impacted the banking and finance industry as we know it today. It was this turbulent period that provided the impetus for the substantial body of financial regulation that has been introduced over the last 10 years, as well as the enhanced legal data requirements that this body of regulation imposes, extending beyond the business and operational needs for such legal data.

In subsequent chapters we will further examine the Financial Crisis through various lenses, as some of the more pertinent aspects of recent financial regulation (such as regulatory capital requirements, margin for uncleared derivatives and recovery and resolution planning) are considered in detail. It is impossible to adequately consider legal data within the banking industry without reference to the Financial Crisis. The substantial regulatory change that has occurred affects how banks conduct business; therefore, legal data, once initially important for business optimisation and business processes, is now mandated for regulatory compliance.

For the purpose of this book, any reference made to the ‘Financial Crisis’ should be taken to mean the financial crisis of 2007–2008 and its subsequent impact. In the context of this book, by legal data, we are usually referring to legal agreement and/or legal opinion data, or that representing financial rules and regulations.

## The Financial Crisis – Looking Back

The world of finance has undergone a tremendous period of change, including much retrospective questioning and attempted diagnoses, since the Financial Crisis. Albeit with the benefit of hindsight, the seeds and signs of impending trouble were undoubtedly present and grew in the build-up to the dramatic events of 2007. Many of the effects of the issues that came to light during the Financial Crisis unexpectedly compounded each other, catching out investors, dealers, banks, regulators and politicians.

Most put the cause of the Financial Crisis down to the rapid expansion of the securitisation markets and a backdrop of accommodative monetary policies serving to heighten the value of the housing market prior to 2007. Sub-prime borrowers were encouraged to take out more and bigger mortgages – in effect, creating an inflated ‘housing bubble’.

Some also attribute the Financial Crisis to finance professionals who lost track of the risks they were generating by entering into securitised deals, compounded by a lack of regulation. Bank regulation in respect of the level of capital that banks need to hold based on the Basel Accords played a part in encouraging unconventional banking practices to optimise regulatory capital treatment, contributing to the Financial Crisis. The repeal of the Glass-Steagall Act removed the previously mandated separation of investment banks and depository banks, effectively providing a stamp of approval for a universal risk-taking bank model. Financial firms were allowed to move significant amounts of assets and liabilities off-balance sheet, into complex structures such as structured investment vehicles (SIVs), having the effect of masking the real risks, in particular, capital and leverage involved, only to be unmasked and unravelled during the full force of the Financial Crisis. Furthermore, the over-the-counter (OTC) derivatives market was substantially unregulated, however, it increased exponentially in volume and complexity. From supposedly being a risk-mitigant tool at heart, their usage quickly became a significant source of systemic risk in the midst of the Financial Crisis.

Overall, the explanations given for the Financial Crisis are still hugely contested. Perhaps this is because of the undeniable complexities of the subject and the banking system as a whole, leading to an oversimplification of its causative features, or maybe it is because of the tendency to lay blame or scapegoat on particular actors in the financial markets.

It is crucial, however, to remember that banking is ultimately about taking risks. Without the assumption of risk by those financial firms best placed to assume and manage the risk, there is no banking business and therefore no financial intermediation system. The issue was the inability to identify activities that were too risky for the banks to undertake, both by the banks themselves and by their regulators.

Within the financial markets, there was a natural incentive for the underpricing of systemic risk by financial institutions. Absent regulation, they were not commensurately burdened with the costs of the broader systemic risks, fostering and, in many cases, rewarding risky behaviour. Through the Financial Crisis, the public at large ultimately bore the burden of the market failure, due to the 'too big to fail' view of the largest financial firms.

Regulators' forecasts of serious problems and 'dire prophesies' years in advance of the Financial Crisis were largely ignored, partly because of the successful lobbying by the very financial institutions that are today either bankrupt or had to be rescued with government funding. For instance, the failures of the two federal agencies (Fannie Mae and Freddie Mac) were preceded in 2005 by a successful \$2 million campaign by Freddie Mac to lobby Congress from restricting their own investments in higher-risk mortgages. These same agencies, banks and other institutions provided assurances that their lending practices (including those enabling loans without adequate documentation) were 'safe' based on evaluations of past data.

Data played a significant role through a failure to provide business intelligence on the underlying causes of the Financial Crisis, occurring not only at the individual firm level but also at the broader industry and supervisory level, and being unable to aggregate and derive the required intelligence in relation to the rising systemic risk beforehand. At the individual firm level, it is a significant failure that the data available and used to supposedly optimise the business decisions, in fact, could not even ensure survival in many cases.

Given this, it is welcome, and not surprising, that a number of the regulatory responses to the Financial Crisis have been to increase the banking data requirements, from transaction to trade and legal agreement-level reporting.

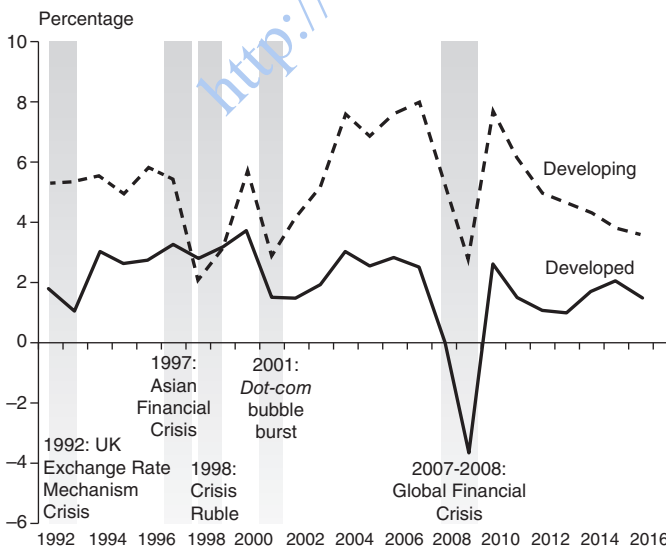
There have been issues identified concerning:

- the scope of data available (i.e. that within the shadow banking system, such as hedge funds and the OTC derivatives market);
- the understanding and governance of the data available;
- the quality of the data; and
- the way in which the data was used to derive the required business intelligence.

To better understand the role data should have played prior to the Financial Crisis, and needs to play going forward, from both business optimisation and regulatory perspectives, it is worth considering in more detail some of the causes of the Financial Crisis.

## Causes of the Financial Crisis

The economic backdrop of the financial system is particularly crucial to explaining the onset of the Financial Crisis. Some commentators attribute the start of the Financial Crisis to the American Federal Reserve's change of policy post-2001. In the wake of the *dot-com* bubble bursting, the American Federal Reserve lowered their interest rates to 1% in an attempt to keep the economy strong. The implication of this low rate was a low return on investment for investors, causing them to limit their investment activities, but also an increase in borrowing. Many banks used this abundance of cheap credit as leverage. Essentially, this involved borrowing to amplify the outcome of a deal; using debt to, for example, buy larger quantities of a product than cash flow would otherwise allow and then selling that product for a huge profit, even after the cost of interest (see Figure 1.1).



**Figure 1.1** The impact of the 2007–2008 Financial Crisis on global GDP growth

The monetary policy increased financial institutions' willingness to take on risky assets, driving the demand for collateralised debt obligations (CDOs) and collateralised loan obligations (CLOs). These combined risky mortgages together with other financial assets before *slicing* them into different tiers, or tranches. Each slice – or tranche – would be made up of securities with different financial terms, meaning that they could then be marketed to investors based on the presumed level of risk. These tranches were prioritised such that the most senior tranche related to the lowest risk assets – offering safer assets, but a lower return. The most junior tranches would relate to the riskiest assets (and offer the highest returns), and if underlying assets defaulted, the tranches affected first would be the most junior ones, rising to more senior tranches as the level of losses increased. The aim was to construct a portfolio of well-diversified assets and reduce risk through diversification. However, the quality of the CDO/CLO depends on the quality of the assets in the portfolio and most importantly, on the correlation of different tranches, which is managed by a CDO/CLO manager.

Furthermore, there was an increased use of synthetic products – for example, a synthetic CDO where the underlying asset, such as a mortgage, is instead replaced with a synthetic equivalent, such as a credit default swap (or other derivatives). With a limited number of actual assets to meet the demand of these products (surely another data metric of note in assessing the build-up of systemic risk), these synthetic products thrived, being cheap and easy to create. In fact, synthetic issuance jumped from some \$15 to \$60 billion in the space of a single year in 2005, valued notionally at around \$5 trillion. For example, the value and payment stream of a CDO would be replaced with premiums paying for 'insurance-like'<sup>1</sup> credit default swap protection on an underlying reference asset(s) from defaulting. This allowed speculative views to be taken on the underlying assets, even when they didn't ultimately exist. These assets hence offered a way to obfuscate the true risks being introduced into the global financial system and amplified, for example, the sub-prime mortgage bubble. The data available – used by the regulators and market participants – was incomplete, inaccurate or simply not fully understood in terms of the caveats to it (partly due to the sheer complexity of financial products and engineering).

In 2006, interest rates in the USA started to rise in an attempt to control inflationary pressures. This meant that homeowners began to struggle to make mortgage payments, especially in respect of sub-prime mortgages that had grown in the previously easy credit/low-interest-rate environment. Bank traders started to feel the impact of declining interest in CDOs/CLOs based on the growing issues with the underlying assets. There was therefore a repackaging of this risk by splitting out the problematic parts and creating new CDOs/CLOs with them – with large commissions and fees continuing to be paid both to traders and the CDO/CLO managers. Ironically, in many cases, the banks selling the CDOs were actually the investor, lending most of the funds to their clients in order to purchase them. This was a clear failing in the data aggregation to understand the vicious circle being

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1 With apologies to the legal and regulatory correctness of this statement!

created, partly driven by the opacity of the inherent synthetic derivatives in these products, which increasingly formed a part of the more and more complex financial product engineering. Consider the CDO-cubeds that were created, a CDO that invested in CDO-squareds (which are CDOs that invested in other CDOs). As Les Leopold states in his 2009 book *The Looting of America: How Wall Street's Game of Fantasy Finance Destroyed our Jobs, Pensions, and Prosperity and What We Can DO About It*:

*But what if you can't sell all the bottom tranches of the CDO-squared securities? You guessed it. You form another pool of these untouchables ... and tranche away again.*

The modelling assumptions that had been used to manage the risk and diversify it ultimately failed in the Financial Crisis and could not sustain the plummeting asset prices at the very heart of these products. This left financial firms holding boxes of worthless (or close to!) CDOs/CLOs that could not be sold or used as collateral, despite rating agencies' seals of approval (yet another data shortcoming exposed in the Financial Crisis). This undermined the credit rating agencies' data, relied upon by investors to determine the level of risk, leading to a loss of confidence in the market. The Financial Crisis also exposed the potential effect of conflicts of interest, with the very same credit rating agencies that the banks relied upon to create the CDOs/CLOs being paid by the banks to provide the credit ratings that acted as a seal of approval to investors.

As the Financial Crisis started to unfold, financial institution traders, finding it harder to shift the CDOs/CLOs containing elements backed by riskier assets, would split these elements out and create new ones that effectively bought these 'toxic parts'. By creating new CDOs/CLOs, they were able to earn their commissions, with the CDO/CLO managers buying these new CDOs/CLOs with the traders' banks themselves lending most of the money to buy them. Effectively, the bank selling the CDOs/CLOs was itself the customer. As a higher and higher proportion of these CDOs/CLOs failed to sell, again they would be sliced up and the worst bits sold into new CDOs that the traders created, recursively self-dealing.

The OTC derivatives market was identified as one of the chief villains in the global crisis (Warren Buffet had famously previously labelled them as 'financial weapons of mass destruction' in 2003). As largely unregulated, bilateral arrangements, OTC derivatives were somewhat of a black-box to regulators. Their complexity resulted in significant information asymmetry between those using such products and the regulators. The well-documented derivatives troubles of Bear Stearns, AIG and investment banks post-crisis ultimately showed the lack of understanding of their inherent risks for even the supposedly most sophisticated of users. Derivatives originally came into being as a means to manage risk, as a protection against a possible catastrophe or market event. For example, farmers would enter into a contract where they would agree to sell their crops at a certain time in the future for a predetermined price. This meant that should the crops be negatively affected by bad weather or disease, the farmer could ensure he or she would

still make money and a good living. But what started as a way to hedge risk could also be used as a speculative tool. The issue is that when packaged products become so complex that no one truly understands their underlying level of risk, they cannot be reliably used for the purposes of safely generating returns. Many banks who entered into derivative contracts did not know or understand the full extent of their liabilities. Moreover, the number of derivative contracts that were entered into, accumulating these risks, was huge and sufficient to cause financial disruption with the backdrop of the other market stresses developing.

An underlying problem at the heart of the Financial Crisis was that new instruments in structured finance (including derivatives and securitised and collateralised debt instruments such as syndicated loans, collateralised mortgage obligations and credit default swaps) developed so rapidly that the market infrastructure was not prepared when those instruments came under stress. Because of the complexity of many of these products, investors were unable to make independent judgments on the merits of investments, and the risks of aggregate effect market transactions were obscured. Moreover, regulatory requirements such as record-keeping and reporting were insufficient and fragmented, as they had not had time to be developed, nor did regulators ever realise the seriousness of the situation. Many commentators argue that regulators mishandled the Financial Crisis. They failed to exercise proper oversight of financial institutions and were unable to keep economic balances in check. According to *The Economist*, lax capital ratios proved to be the most significant regulatory shortcoming: regulatory rules prior to the Financial Crisis failed to define capital strictly enough, enabling banks to smuggle in forms of debt that did not have the same loss-absorbing capacity as equity. Essentially, banks were too highly leveraged and operated with insufficient equity to protect themselves in the event of disaster. Had they been in place, regulators could have been made aware that systemically vital institutions were without adequate capital and that the market was at risk of collapse. The problem is that, as explained by the economist Brian Wesbury, the crisis could never have been on the dealers trading with these instruments. He describes the financial climate in the run-up to the recession as being like a system of traffic lights and argues that when a traffic light is green, you will never see a driver get out of their car to check the traffic light at the adjoining junction is red so that it is safe to cross the intersection. Likewise, when interest rates are down to as low as they were, it is only natural that banks and investors will leverage and make the most of seemingly good opportunities. The onus should have been and – even more so – is now on the regulators to ensure that the system and its inherent risks are properly managed.

The chasing of short-term profits and individual incentivisation schemes encouraged an unsustainable level of short-term risk-taking and reliance on financial modelling. Simply consider AIG. This major insurer of debts via credit default swaps placed 'blind faith in financial risk models' and for a few years their small elite staff of financial modellers generated large incomes for the firm (and equally large bonuses for individuals). However, that later turned into decimating losses for AIG as the mathematical credit risk models developed, and the data they provided, were ultimately incorrect. There was significant underestimation of the likelihood of sudden large events, which are especially important in the credit markets as the tail of a distribution is key in predicting the defaults that typically have a low probability of occurrence and a failure to consider inter-related systematic risks.

In fact, the regulatory community had itself not been alert to the growing systemic risks and if anything was misled by the data, in terms of scope, timeliness, accuracy and aggregation. In an article entitled ‘Market-based risk is changing banking’, the then leaders of the banking and capital markets sector of the FSA claimed:

*From ‘hold what you originate’ the business model of banking is shifting to ‘underwrite to distribute, and buy what makes sense to hold.’ Banks are shifting to market-based risk management [...]. Traditionally, banks originated loans to customers, which they held on their balance sheet until maturity. Banks still originate loans, but aim to reduce their exposure, either by selling participations in the loan to other investors – not all of them necessarily banks – by securitising the loans, or by buying credit protection in the derivatives market. At the same time, banks are buying exposures to credits not only through purchases of participations in loans originated by others, but also through selling credit protection and buying collateralised debt and loan obligations (CDOs and CLOs) [...]. Regulation supports this move towards market-based risk management. Under Basel 2 and the Capital Requirements Directive, capital regulation is moving in the direction of economic capital. Capital is now assessed in line with risk, and the new capital regulation framework gives much more adequate recognition for credit mitigation factors such as derivatives and securitisation. (Financial Times 2007)*

Ultimately, of course, it is hard to argue, post-crisis, that the recognition of these factors was, in fact, misled. In most cases, the data available did not allow recognition that, rather than dispersing the risks, many turned out to be concentrated in entities that were unable to bear them. For example:

- Conduits and SIVs held the assets with substantial leverage coupled with maturity and liquidity risk – therefore very vulnerable to classic bank ‘runs’.
- Banks ended up with indirect exposures (through contingent credit lines, reputational risks and counterparty credit exposures) to many of these vehicles (despite assuming, from their knowledge of the risks and supporting data, that the risks had been transferred away).

## Systemic Financial Contagion

The seriousness of the onset of financial contagion demonstrates the importance of the regulatory landscape in avoiding future systemic failures in the financial sector. Once the Financial Crisis had fully started to take hold, the market was overwhelmed with firms trying close-out trades at the same time. However, different financial institutions were also inter-related and dependent on each other, as they had all been borrowing from and transacting with each other. Cross-default clauses in financial contracts, which will be discussed later within this text in detail, demonstrate part of the problem when it comes to the interconnectedness of financial institutions. Standard default and termination clauses in financial contracts mean that if a party to the contract fails to perform its financial obligations, the other party can terminate the arrangement. Cross-default clauses put a party into default if they default on another obligation under a separate

contract with a third party. This can have a domino effect; if one party defaults under one relationship, other defaults are triggered elsewhere.

Additionally, when – during the Financial Crisis – counterparties started to default and could no longer rely on failed institutions' promises to fulfil their commitments, financial institutions began to lose trust in one another, causing them to withhold short-term credit. This became known as the *credit crunch* – a crisis caused by a sudden reduction in the availability of liquidity in the financial markets. Gokay (2009) describes the credit crisis as being comparable to a heart attack:

*Every modern economic activity depends for their day-to-day activities on continuous borrowing and lending. [...] If it is not dealt with properly, the whole system immobilizes. That is why all those governments rushed to interfere, pouring billions of dollars into private banks, hoping the recipients will use the cash to start lending and borrowing again.*

Financial contagion can occur on both a domestic and an international level and can be observed via co-movements in exchange rates, stock prices and capital flows. However, this is not a problem that can be resolved purely by the inflow of more capital into the market. It is not likely that the financial sector will ever start trading or lending again with the same relaxed attitude, even once liquidity has fully improved. Moreover, the influx of regulatory requirements is now seemingly a thing of permanence.

## The Legal Data Consequence

Each of the identified vulnerabilities that helped cause the Financial Crisis or increase its intensity (lack of capital, liquidity risk and so on) catalysed banking regulatory reform. Such regulatory reform has included the introduction of:<sup>2</sup>

- The US Dodd–Frank Act
- The Basel Committee's Third Accord
- The European Market Infrastructure Regulation (EMIR)
- The Alternative Investment Fund Managers Directive (AIFMD)
- The Market Abuse Regulation (MAR)
- The Markets in Financial Instruments Regulation (MiFIR)
- The Foreign Account Tax Compliance Act (FATCA)
- Client Assets Sourcebook – Client Money and Assets Rules (CASS)
- Margin for Uncleared Derivatives Regulation
- Securities Financing Transaction Regulation (SFTR)
- Recovery & Resolution Regulation [such as Recordkeeping Requirements on Qualified Financial Contracts (QFC) and the Bank Recovery and Resolution Directive (BRRD)]

Accordingly, the sector has been hit by a torrent of new regulatory requirements. Many of the above regulations mandate, or indirectly require, a number of data

<sup>2</sup> This list contains a number of overlaps and inconsistencies, and has a focus on US and EU regulation, but is intended to present a good picture of the coverage of regulated themes, rather than anything remotely approaching a comprehensive list.



reporting requirements, from the reporting of transactions to that of key contractual terms. Ultimately, many financial instruments, and therefore their consequences that need to be better understood, managed and regulated, simply consist of a series of complex contractual obligations – or legal data. It is this legal data that is the subject of this book, seeking to demystify and provide guidance on some of the challenges that exist in ensuring this data on the contractual obligations is complete, accurate and ultimately useful, from the perspective of business optimisation, operational management or regulatory compliance. Increasingly, there is criminal liability attached to ensuring operational effect is given to meeting regulatory mandates, significantly increasing the burden of reliance on legal data by senior management at financial institutions, such as in the context of the treatment of client assets and money.

It should be noted that the post-crisis regulatory response, whilst large-scale in the changes made to the fundamental banking infrastructure in many parts, has also brought out and increased differences in standards and expectations globally. There is also an increasing need to maintain data on the regulations themselves and to be able to understand the cumulative impact for an impacted firm – yet again, a significant data challenge. In an ever-increasingly globalised world, this also, with the prospect of regulatory arbitrage it brings, raises the challenge for supervisory bodies utilising data to be on top of the consequences of regulation.

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