1 Opening case study: the financial crisis

Introduction

There have been many financial crises over the last thirty years, but the crisis that emerged in 2007 and peaked most dramatically in 2008, commonly referred to as *the* financial crisis, was like no other. By the late summer of 2008, most of the world's largest banks, and many smaller ones, were carrying massive liabilities in respect of derivative securities linked to US subprime mortgage valuations. These valuations were in free fall, but the derivatives were so complex that the banks often had only a vague grasp of their own exposures, let alone those of the many other banks with which they traded on a daily basis. A string of major banks either collapsed altogether or survived only through massive injections of government funds. And as the banks became reluctant to risk lending to each other, the banking system as a whole came perilously close to collapse. The system survived, but the crisis quickly shifted to the rescuing governments, most of which were already over-borrowed, generating a global national debt crisis. Meanwhile the uncertainty associated with the crisis led to widespread economic recession, exacerbating national debt problems and prompting further austerity measures, and deepening recession. As of 2013, the effects of the financial crisis still dominate the world economy and the politics of both Europe and the USA, and they look likely to continue doing so for many years yet.

Apart from its economic effects, the financial crisis has also impacted enormously on the way people think about finance and the financial sector. This sector has always been treated with a certain amount of moral suspicion, but events have thrown a spotlight on its practices, and many people don't like what they see. They particularly dislike the way the sector appears to continue thriving, paying massive bonuses, earning large profits and paying little taxes, while the public at large have, as a consequence it

seems of the banks' excesses, to suffer unemployment and austerity. But there is also much more widespread criticism than before of the specific practices of the sector.

In this opening chapter we set the scene for the rest of the book by presenting a case study of the core events leading up to the crisis and the immediate responses to it. This case study draws mainly on the "official" account of the crisis as experienced in the USA, *The Financial Crisis Inquiry Report*, but, unlike that or the many other published accounts of the crisis, it makes no attempt either to provide a definitive account (impossible, given the space limitations) or to apportion blame.[1] In the tradition of business school case studies, it is intended simply to provide a basis for the discussion of ethical issues and not to illustrate either good or bad ethical practice.

The financial crisis

The context: easy money and deregulation

The new millennium had not started well. A technology and Internet stock market boom had peaked in 2000 and had been followed by the inevitable bust, and by a series of high-profile corporate collapses, including those of Enron and WorldCom, at that point the world's largest ever corporate bankruptcies. The 9/11 terrorist attacks had badly hit confidence and the major world economies had gone briefly into recession.

The financial sector had not come out of the dot.com bubble looking particularly good. A number of investment banks had been charged with various offenses relating to the fraudulent promotion of client company shares, and both banks and accounting firms had been deeply involved in the fraudulent misrepresentation of earnings at Enron and WorldCom. The economic impact on the sector was, however, modest. The traditional

[1] Financial Crisis Inquiry Commission 2011. Although the conclusions of the report are politically loaded, with a Democrat majority offering one set of conclusions and Republican minorities alternatives, the report is indispensable for its comprehensive coverage and in its concern to elucidate the facts as a basis for judgment. The Commission interviewed over 700 witnesses, received a mountain of documentary evidence and employed a staff of over 80 to sort and analyze it all and build a publicly accessible library of testimony and resources. For other accounts of the crisis, see Bitner 2008; Davies 2010; Jickling 2009; Morris 2008; Muolo and Padilla 2010; Posner 2009; Shiller 2008; Stiglitz 2010; and Tett 2009.

banking sector continued its long-term growth with barely a blip, accounting for about $7 trillion in loans and deposits by 2004. The rapidly growing shadow banking sector, made up mainly of the investment banks and money market mutual funds, was more heavily affected, but only briefly. Having roughly doubled in size in just four years from 1997 to 2001, it grew more slowly for a couple of years, but nevertheless matched the traditional sector in loans and deposits by 2004, after which its growth accelerated again at its previous rate. The financial sector was also increasingly well rewarded. While average bank pay from the 1940s to the 1980s had been roughly in line with average pay in other sectors, by the early 2000s it was almost double, with a substantial proportion of pay tied to short-term performance bonuses and, for senior managers, share price-based incentives.

By 2004, the major economies were out of recession and interest rates, especially in the USA, were at a record low. The low US interest rates were partly engineered by Alan Greenspan at the Federal Reserve to stimulate economic growth through domestic spending and the housing market, but they were also a natural consequence of a lot of money looking for safe investments. With oil prices double what they had been in 2001 and still rising steadily at over 25 percent a year, industrial growth in the developed world was limited, but the oil-producing countries were flush with cash. The Chinese economy was also growing rapidly on the basis of its manufacturing exports and building up massive dollar reserves. Much of this money was being invested back into US government bonds and other low-risk securities, pushing down interest rates across the board.

The banking sector by this stage had been heavily deregulated. In the USA, the strong regulatory framework created in the mid-twentieth century had been steadily eroded, culminating in the repeal of the Glass-Steagall Act, which had for decades prevented commercial banks from taking on risky investment banking activities. The large commercial banks, led by Citigroup, were now heavily involved in investment banking activities and had also taken over much of the savings and loans sector (the US thrifts, similar to UK building societies). The investment banks had diversified aggressively beyond their core advisory and underwriting activities into deposit taking through money market mutual funds and into speculative trading, especially in the derivatives markets, both for clients and on their own accounts. Despite a series of high-profile crises during the 1990s, culminating in the collapse of the pioneering hedge fund Long-Term

Capital Management, these markets had remained almost entirely unregulated and indeed had been formally exempted from regulatory oversight in the 2000 Commodity Futures Modernization Act.

Meanwhile, the UK and other countries had also deregulated their financial sectors, and in some of the more radical cases, such as Ireland and Iceland, this had led to the rapid growth of high-risk banking sectors out of all proportion to their host countries' economies. Internationally the Basel II rules for the regulation of commercial banks had replaced the traditional requirement that banks maintain a fixed percentage of their assets as equity capital with more flexible requirements based on the banks' own analyses of their risk profiles using a measure called Value at Risk (VaR). In the USA, a similar but looser and effectively unsupervised regime had been introduced for the investment banks.

Under these conditions, the financial sector was growing rapidly in both scale (between 10 percent and 20 percent each year) and scope (expanding into new areas of derivatives trading), and was stretching its resources to the limit to exploit new opportunities. This stretch was reflected in the banks' leverages, the ratio between their assets or liabilities and underlying equity capital. Traditionally, for every $1 million of capital, banks would borrow about another $11 million, giving them about $12 million to lend or invest (leverage of 11:1 or a capital ratio of 1/12 or about 8 percent). The change in their activities had increased the risk of their lending and investment, and increasing leverage meant increasing that risk still further. But it also meant higher share price valuations relative to a bank's capital base, and so higher stock-based compensation for the top executives. It also enabled a higher level of the kind of those risky activities – predominantly proprietary derivatives trading – that fed into the bonus pool.

Not all commercial banks increased leverage in this period: JP Morgan Chase and Wells Fargo, for example, remained relatively conservative in this respect. But the more aggressive banks increased it significantly, with Citigroup, the most aggressive of all, leading the way. The same was happening at all the investment banks and at most of the European banks. By the time of the crisis, leverages of 35:1 to 45:1 were commonplace in both commercial and investment banks, meaning that banks only had equity cover for a 2–3 percent loss in asset value. In some cases, moreover, the official figures hid higher values still, as risky assets were placed off balance sheet or parked overnight (sold and repurchased) at the end of each

accounting period. For the US mortgage agencies Fannie Mae and Freddie Mac, leverages reached 75:1.

Common sense would suggest that a 3 percent dip in asset values is not that improbable and that for banks to risk insolvency as a result of it was crazy. But the statistical models used assumed: (a) that the risks to which the banks were exposed were largely uncorrelated, so that their total portfolios were much less risky than their components; and (b) that the sizes of any losses were subject to normal distributions, so that really large losses were extremely unlikely. As Nassim Taleb has pointed out, the way in which the banks' value at risk was expressed also seems designed to give the impression that things are less risky than they are. A VaR of one day, 1 percent and $10 million sounds as if a $10 million loss is very unlikely, when what it signifies is that on two or three trading days each year, *at least* $10 million will be lost. Even assuming normal distributions, the "at least" is highly significant, and if the distribution tails are longer (as critics like financier George Soros and mathematician Benoit Mandelbrot had long been insisting), it is massively so.[2]

Within the financial sector, a number of areas were particularly buoyant at this time and one of these was mortgage lending. Here US deregulation in the 1980s had been followed by a house price bubble, extensive fraud and the collapse of many of the traditional thrifts. Much of the thrifts' business had, however, been taken over by the commercial banks and, fuelled by the Fed's low interest rate policy, the market was again booming. Mortgage originations, having run at around $100 billion a year up to 2000, had risen to $300 billion in 2003, over $500 billion in 2004 and were set to keep rising. A growing proportion of these new mortgages were, moreover, subprime mortgages. Against a historic average of under 10 percent, these were accounting for 21 percent of the mortgage market by 2004, an increase from around $10 billion a year to around $200 billion a year. This growth in the mortgage market came at a time when real wages in the USA were actually falling. But with low interest rates and easy access to mortgages, even for those with a poor credit history and no earnings record, the housing sector was booming. Average US house prices doubled in the first six years of the century, and people increasingly took advantage of house price rises to remortgage and release money for spending.

[2] Mandelbrot and Hudson 2008; Soros 1998; Taleb 2004.

Another boom area was the sale of asset-backed securities, commercial bonds issued by the investment banks and secured on a package of underlying financial assets such as car loans, credit card debt and student loans. A substantial and growing part of this market, valued at between $3 trillion and $4 trillion, was in mortgage-backed securities, with the majority of new mortgage loans being securitized. And by 2004 these had given birth to a new kind of security, the collateralized debt obligation (CDO). A third area of rapid growth was in derivatives, including credit default swaps (CDSs). Central to any understanding of the financial crisis is an understanding of how these CDOs and CDSs worked.

The products: the strange world of mortgage-backed securities

Traditional building societies and thrifts were mutual organizations that took deposits from savers and lent to borrowers. Much of the time, no other institution was involved. For many decades, however, American thrifts have been able to sell on mortgages (i.e., the income streams from the mortgages together with the underlying security) to other institutions, notably the Federal National Mortgage Association (known as Fannie Mae) and later also the Federal Home Loan Mortgage Corporation (known as Freddie Mac). The basic idea was to encourage home ownership. Left to their own devices (and working under tight regulations), the thrifts could only lend as much as they could borrow from their savings depositors, but by buying up mortgage loans, these institutions effectively took them off the thrifts' books and so made it possible for them to make new loans without raising new deposits. The agencies repaid the thrifts the costs of their mortgages and took over entitlement both to the interest and repayments, and to the security of the properties should the homeowner default.

The original institution, Fannie Mae, started life as a government agency, but this meant that the government had to pay for the mortgages and hold them on its own balance sheet, and by the early 1970s Fannie and Freddie, though government-backed, were private corporations. They could still pass on their mortgages to a new government agency, Ginnie Mae, but they could also securitize and resell them on the markets. What this meant was that a whole load of mortgages would be bundled together and sold to a specially created company, which in turn would issue interest-paying bonds, backed by the mortgages as security, to investors. Each

investor ended up, in effect, investing in a small proportion of a lot of mortgages. Because houses were seen as an ultra-safe investment, and because Fannie and Freddie were only allowed to buy "conforming" mortgages which met high underwriting standards and were therefore especially secure, these were attractive investments. Moreover, because the interest paid by homeowners on their mortgages was much, much higher than the interest paid out on other safe investments like government bonds, there was scope for all of the originating thrift (the company that first set up the mortgage), Fannie or Freddie and the securitizing company to take hefty fees and still leave investors in the mortgage-backed securities with a very attractive interest rate.

Initially, securitization was limited to "prime" or "conforming" mortgages, but in the 1980s investment banks saw a money-making opportunity and began buying up, securitizing and selling "non-conforming" loans: mortgages issued on the basis of lower deposits, or poorer credit records or ability to pay on behalf of the homeowner; mortgages on variable rates, such as teaser mortgages that offered very cheap rates for the first few years but then became much more expensive; adjustable-rate mortgages that left it to the borrower to choose how much, if anything, to pay back (option ARMs), and even allowed in the early years for repayment levels that increased the amount owed; "piggy-back" mortgages, provided on top of a conforming mortgage so as to provide a higher overall loan level; mortgages right up to or even in excess of a property's assessed value; and "no-doc" mortgages that charged high interest rates but required no evidence of ability to pay. These "subprime" mortgages were much more risky, but the interest rates were correspondingly higher and with rising house prices and the security of the underlying properties, they still seemed to be "as safe as houses." They could also be "tranched," which is where things start to get a bit complicated. To explain, let us look at a typical deal from 2006, CMLTI 2006-NC2, with a value of just under $1 billion, which was used as an illustration in the *Financial Crisis Inquiry Report*.

CMLTI 2006-NC2 was based on 4,499 mortgages that were originated by New Century Financial, a Californian mortgage lender. All these mortgages were subprime, so failed to meet normal underwriting standards (or at least what had been normal underwriting standards before the 2000s) in one way or another. They were bought up by the banking conglomerate Citigroup and were sold on to a separate company set up by Citigroup, which owned

the mortgages and issued the securities. (This arrangement kept the deal off the Citigroup balance sheet, so that the debts didn't count when it came to calculating its capital ratios.) For securitization purposes, the mortgage pool was divided into 19 tranches (see Table 1.1), each of which offered investors a different interest rate and repayment schedule and a different priority claim on the flow of payments associated with the mortgages. Note that the tranches were not based on different sub-pools of mortgages, just on different risk-return relationships relating to the pool as a whole. To complete the offering, each tranche was given an investment rating by the ratings agencies (Moody's, Standard & Poor's and Fitch). This was effectively an opinion, paid for by the securitizing company, as to how safe an investment in that tranche was likely to be.

The idea behind the product was that there was a sufficient flow of interest payments from the underlying mortgages for Citigroup to take a generous securitization fee and still find investors for all the tranches, each one appealing to different investors with different risk-return profiles. The yields here were based on the London Interbank Offered Rate (LIBOR), which in theory was the rate at which banks lent to each other. It only transpired much later that the rates declared by the banks were not always those actually paid, but were systematically manipulated to their advantage.[3]

As with the banks' value at risk calculations, the ratings provided by the agencies were based on standard statistical assumptions. In this case they were also referenced to historically low rates of mortgage defaults (under, of course, very different conditions). The banks, which were paying for the ratings, also made it pretty clear what they wanted for their fees. Thus, although the underlying mortgages were all subprime, it was assumed by the ratings analysts that only very few would default and that even in that event, much of the security would be recovered. The tranching loaded the risk of default onto the lowest tranches, ensuring that the higher ones got impeccable ratings. In this case 78 percent of the securities issued by value, comprising the top four "senior" and "super-senior" tranches, were rated AAA, or as safe as government bonds. At the other end of the scale, just 1.5 percent of the value was issued in "equity" tranches, which bore no rating and, analogous to the risk capital in an enterprise, only got anything back

[3] See, for example, www.bbc.co.uk/news/business-19203103.

Table 1.1. *CMLTI 2006-NC2*

Tranche	Value ($m)	Value (%)	Rating	Yield	Investors
Senior					
A1	155	16.3	AAA	LIBOR + 0.14%	Fannie Mae
A2-A	282	29.7	AAA	LIBOR + 0.04%	Banks, investment funds
A2-B	282	29.8	AAA	LIBOR + 0.06%	Banks, investment funds
A2-C	18	1.9	AAA	LIBOR + 0.24%	Banks
Mezzanine					
M1	39	4.1	AA+	LIBOR + 0.29%	Banks, investment funds, asset managers
M2	44	4.6	AA	LIBOR + 0.31%	Banks, investment funds, asset managers, CDOs
M3	14	1.5	AA-	LIBOR + 0.34%	2 CDOs, asset manager
M4	16	1.7	A+	LIBOR + 0.39%	CDO, hedge fund
M5	17	1.8	A	LIBOR + 0.40%	Kleros III plus another CDO
M6	11	1.2	A-	LIBOR + 0.46%	2 CDOs
M7	10	1.0	BBB+	LIBOR + 0.70%	3 CDOs
M8	8	0.9	BBB	LIBOR + 0.80%	3 CDOs, bank
M9	12	1.2	BBB-	LIBOR + 1.5%	5 CDOs, asset managers
M10	14	1.4	BB+	LIBOR + 2.5%	3 CDOs, asset manager
M11	11	1.2	BB	LIBOR + 2.5%	Unknown
Equity					
CE, P, R, Rx	13	1.4			Real estate finance company *et al.*

Source: Financial Crisis Inquiry Commission 2011, p. 116

once all the bondholders had been paid. Between those, nine "mezzanine" tranches, 21 percent of the value, were given investment-grade ratings from AA+ down to BBB-, and two further mezzanine tranches, about 2.5 percent of the value, were given junk bond ratings.

As can be seen from Table 1.1, the senior tranches of this security were bought mainly by banks and investment funds. The more risky junior tranches were bought by CDOs, a CDO (in this case a cash CDO backed by mortgage-backed securities) being yet another form of security, put together by buying the junior tranches from a range of different securities and pooling and tranching *those*. The first CDOs had been put together by the infamous Michael Milken out of junk bonds in the 1980s, but they only really took off when used with mortgage-backed securities in the mid-2000s. To continue with our example, some of the junior, higher-risk tranches of CMLTI 2006-NC2 were bought by Kleros III, effectively a joint venture between the big Swiss bank UBS, which underwrote the venture by buying the tranches and selling them to Kleros III, and a specialist CDO management firm, which structured the deal. Kleros III bought about $1 billion worth of mortgage-backed securities in all, of which 16 percent, including just under $10 million of the A-rated mezzanine tranche of CMLTI 2006-NC2, were rated A, 39 percent above A and 45 percent below A. But because the underlying mortgages now came from across the USA and the ratings analysts' models assumed that mortgage failures in different regions would be uncorrelated, no fewer than 88 percent by value of the securities issued by Kleros III, based on mortgages that fell within the bottom 10 percent of the original subprime pool, were rated AAA. And of those that were not, at least half were purchased by other CDOs, to be pooled and tranched yet again.

As the junior tranches were sold from CDO to CDO, keeping track of the underlying securities proved difficult, but at least there were underlying securities. For the finance guys, this was an unnecessary and inconvenient constraint. Enter the CDS, a form of derivative used to hedge against the risk of a borrower defaulting on a loan. As the volume of mortgage-related CDOs grew, the banks that put them together increasingly kept much of the senior tranches for themselves. This was mainly because, in the fervour of the mid-2000s, they were less easy to sell at a worthwhile margin than the higher-risk but higher-interest mezzanine tranches. Because they were seen as ultra-safe, however, the banks were happy to keep hold of them, the cost of doing so