

Draft review essay for *London Review of Books*. Third draft

## Safer than Safe

FOOL'S GOLD: HOW UNRESTRAINED GREED CORRUPTED A DREAM,  
SHATTERED GLOBAL MARKETS AND UNLEASHED A CATASTROPHE by  
Gillian Tett. Little, Brown, 338 pp., £12.99, 30 April, 978 1 4087 0167 6

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Few people's reputations have been improved by the credit crisis. One is the BBC's Robert Peston; another Vince Cable. A third is Gillian Tett, capital markets editor of the *Financial Times*. Prior to the crisis, she and her team were the only mainstream journalists who covered in any detail the then arcane, technical world of 'credit derivatives' (of which more below). Tett saw – however imperfectly – the huge risks that were accumulating unnoticed within that world, and spoke out about them.

*Fool's Gold* begins in a conference room in Nice in spring 2005. Tett admits that at that point she was baffled by the technical language – 'Gaussian copula', 'attachment point', 'delta hedging' – being spoken by the participants. However, before joining the *FT* she had conducted fieldwork in Soviet Tajikistan for a PhD in social anthropology, and the ethnographer in her re-awoke. The conference reminded her of a Tajik wedding. Those attending it were forging and refreshing social links, and celebrating a tacit worldview – in this case, one in which 'it was perfectly valid to

discuss money in abstract, mathematical, ultra-complex terms, without any reference to tangible human beings'.

Who were the key actors in the ceremony, those up on the conference hall's stage? She whispered the question to the man sitting beside her. 'They used to all work at J.P. Morgan. ... It's like this Morgan mafia thing. They sort of created the credit derivatives market.' The answer surprised her. J.P. Morgan was not Goldman Sachs: it wasn't an exciting bank. It bore the name of America's most celebrated financier, but it was 'dull': safe, boring, perhaps a little snobbish. (When its current chief executive, the now well-respected Jamie Dimon, joined the bank from Bank One, which was headquartered in Chicago, Tett reports one Morgan banker muttering 'Not another retail banker from Hicksville, USA!')

The core of Tett's fine book, which is by far the most insightful of the first wave of books on the crisis, is the story of J.P. Morgan's credit derivatives team. For all the bank's traditionalism – the door staff at its London offices wear uniforms that would not be out of place outside the Ritz – it was quietly innovative, and its blue-blooded heritage did not block all diversity. One of the team's driving forces was a young Englishwoman, Blythe Masters; another, Terri Duhon, makes no secret of her upbringing in a trailer in Louisiana; central to its technical work was an Indian mathematician, Krishna Varikooty. Boisterousness that would have horrified John Pierpont Morgan was tolerated. Tett describes how at one off-site gathering in Florida, one of the team's managers broke his nose when he was being pushed into a hotel swimming pool by drunken colleagues.

The team's pivotal innovation was a December 1997 deal they called 'Bistro' (Broad Index Secured Trust Offering). For a decade, banks had been experimenting with credit derivatives, which are ways of separating out the 'credit risk' involved in lending (the risk that borrowers will default on their obligations, failing to make the required interest payments or not repaying their loans) and making that risk into a product that can be bought and sold. Bistro helped turn this tentative activity into big business.

Bistro transferred to external parties the credit risk of loans totalling \$9.7 billion that J.P. Morgan had made to 307 companies. The scheme was an influential version of the CDOs (collateralised debt obligations) that I described in *LRB* on 8 May 2008. Like other CDOs, Bistro was divided into 'tranches', of which originally there were two. Investors in the lower or 'junior' tranche received a healthy rate of return, 375 basis points over Libor (London interbank offered rate), which is the average rate at which a panel of leading banks report they can borrow from other banks. (A basis point is a hundredth of a percentage point.) This compensated the junior investors for the fact that their investments would bear the initial losses, beyond a small reserve built up during the deal's first five years, should any of the 307 borrowers default.

Only if those losses were to exceed the entirety of the investments in the junior tranche would the holders of Bistro's senior tranche – which paid only 60 basis points over Libor – suffer. The loans that made up Bistro were well-diversified across industries, and predominantly to blue-chip companies, so losses to Bistro's senior tranche seemed unlikely enough to Moody's, one of the three leading credit rating

agencies (the others are Standard & Poor's and Fitch), that it awarded the tranche its highest rating, Aaa.

Aaa was a rare distinction. Only a dozen corporations and less than two dozen governments were judged worthy of it: neither Italy nor Japan, for example, has an Aaa rating. (As readers will know, Standard & Poor's has indicated that the UK is now also in some danger of losing its top rating.) Blythe Masters had formidable powers of persuasion, which helped when selling a deal that 'look[ed] like a science experiment, with all those arrows', as one investor quoted by Tett described Bistro's documentation. Yet 60 basis points over Libor, for an investment judged safer than the sovereign bonds of some of the world's leading economies, was the most powerful argument of all: an investor would normally struggle to find an Aaa investment that yielded as much as Libor.

For J.P. Morgan, Bistro solved one problem and potentially addressed a second. First, while the 307 corporations were low risks, even the most creditworthy borrowers can default. So \$9.7 billion in loans to the 307 corporations was a significant constraint on the bank's future lending. Bistro removed that constraint. Second, the Basel Capital Accord, signed by the world's leading banking regulators in 1988 and implemented by them in 1992, forced banks to carry reserves equal to 8 percent of their risk-weighted lending. While certain categories of lending – to other OECD banks, for example – qualified for a reduced reserve requirement, loans to even the safest industrial corporation incurred the full 8 percent, a figure that bankers felt was far larger than justified by the risks involved. J.P. Morgan hoped that the transfer of credit risk achieved by Bistro would persuade regulators to reduce that

requirement considerably, and Tett reports that Blythe Masters and her colleague Bill Demchak pushed the Federal Reserve and the Office of the Comptroller of the Currency to clarify what exactly would be needed to achieve that.

Bistro differed from earlier CDOs in that it did not, in fact, transfer to external investors all the credit risk of the \$9.7 billion of loans. The junior and senior tranches amounted in total to only \$700 million; the bank believed that the chances of losses ever exceeding that figure were too tiny for it to be worth paying investors to shoulder them. The regulators, however, demanded that the bank do something to remove that residual ‘unfunded risk’ before they would relax the 8 percent capital requirement.

The residual risk was like a topmost tranche, sitting on top of the senior tranche; it would come into play only if losses wiped out the latter in its entirety. The senior tranche was Aaa, as safe as it gets; the residual ‘super-senior’ tranche (as the J.P. Morgan team christened it) was thus safer than safe. To satisfy the regulators, however, the team turned to the Financial Products division of the leading US insurer, AIG. Sharing J.P. Morgan’s analysis that the super-senior tranche was ultrasafe, AIG agreed to insure it against all remaining losses, charging an annual premium of only a fiftieth of 1 percent of the sum insured. From the viewpoint of AIG Financial Products, it was small-scale business but apparently highly profitable: by covering an effectively non-existent risk, the firm earned \$1.8 million a year.

In that little afterthought to Bistro – what to do with the super-senior tranche – lay the germ of much of the credit crisis, especially of its disastrous effects on many of the world’s leading banks. Bistro-like deals started in the world of corporate

borrowing, but from 1999 onwards began also to be implemented in the world of consumer debt, especially mortgages. There was actually longer experience of packaging mortgages into securities than of packaging corporate debt into CDOs, and mortgage-backed securities had acquired an admirable reputation for safety.

Mortgage-backed securities have a structure like that of CDOs, with different tranches carrying various levels of exposure to risk. The safest, Aaa, tranches of those securities had impeccably default-free records, and even the riskier tranches had performed well: indeed, on average generally better than corporate bonds with the same ratings. It wasn't that people never defaulted on their mortgages – they did – but the securities were designed to take this into account, for example by building up reserve funds (analogous to but usually proportionately larger than Bistro's small reserve) that would absorb the anticipated losses. For many years, such provisions proved in general fully adequate.

What happened from 1999 on was that mortgage-backed securities, which already represented one layer of packaging of debt, then started to be repackaged into CDOs, thus creating a 'Russian doll' product: a tranched, packaged product each of the components of which was itself a tranche of a packaged product. Given their excellent reputation, putting mortgage-backed securities rather than corporate bonds or loans inside CDOs might seem a small step. Yet when in 1999 Bayerische Landesbank, which had become involved in the US mortgage market, approached J.P. Morgan to package \$14 billion of bundles of mortgages and other forms of predominantly consumer debt into a Bistro structure, there were initially serious doubts within the Morgan team.

The problematic issue was correlation, which is at the core of evaluating a CDO. Low correlation means that defaults are essentially idiosyncratic events, with the consequence that only the bottommost tranche of a typical CDO is at significant risk. In contrast, high correlation means that if defaults happen they tend to cluster, and the clustering of defaults puts investors in the higher, apparently safer, tranches at risk of loss.

Participants in the emerging credit-derivatives market tended to be confident that they had a fair grasp of the correlation of corporate defaults. The rating agencies had large databases of such defaults from which the extent of clustering could be inferred at least roughly, and other market participants often took the easily measured level of correlation between the moves of different corporations' stock prices as a guide to the correlation of their net asset values. (The link between the latter and default is that the most important cause of corporate default is bankruptcy, which can be thought of as happening when a corporation's net asset value falls below zero: that is, when its liabilities exceed its assets.) Clearly, the correlation of the asset values of two different corporations was unlikely to be zero, since general economic conditions will affect both. Nor, however, were corporate asset correlations thought likely to be 1.0, the value that indicates perfect correlation. 0.3 was a commonly-used figure. That, for example, was the standard level of correlation between the asset values of firms in the same industry that Standard & Poor's initially assumed in CDO Evaluator, the software system it began using in 2001 in the rating of CDOs.

The credit crisis has inured us to gigantic numbers – losses measured in billions or trillions of dollars – but we need to pay attention to its little numbers as

well as its big ones if we're going to understand it properly. A correlation of 0.3 was modest. If it was correct it would be highly unlikely that the senior tranche of a CDO such as Bistro would suffer a loss – unlikely enough to warrant an Aaa rating – and effectively inconceivable that the supersenior tranche would be hit.

However, the analysis that had initially produced the widely-used figure of 0.3 was of corporate debt. How could one estimate the equivalent correlation for mortgage-backed securities? Paradoxically, their very safety was a disadvantage in this respect: there was effectively no record of default that could be scrutinised for traces of clustering. Nor did such securities trade often enough for the correlation of their prices to be measured: most investors in them simply held them until they matured. Intuitively, though, it seemed conceivable that defaults in bundles of mortgages or other forms of consumer debt could be quite highly correlated, because of the likely role played by matters such as the overall unemployment level, and that could make a CDO based upon mortgage-backed securities an unduly risky product.

In an interview I conducted with her, Terri Duhon, who led the Bayerische Landesbank mortgage-backed CDO, told me that this caused some of her J.P. Morgan colleagues initially to doubt whether the deal should proceed: they argued that 'there is no way that we should be doing this because it's way too correlated'. Tett reports that Krishna Varikooty, for example, was concerned by a correlation risk that seemed to him to be unquantifiable. Intensive discussion and analysis, and very conservative structuring of the deal eventually led to agreement that it was safe to go ahead (it helped that unlike in many more recent deals the ratings of the underlying assets were high – around 95 percent had Aaa ratings – and it contained no securities based on

subprime mortgages). Yet the reservations remained, and J.P. Morgan was only ever to construct one further large CDO, and a limited number of smaller ones, in which the underlying assets were bundles of mortgages.

In consequence, the bank remained on the sidelines as the previously largely distinct worlds of CDOs and of mortgage-backed securities became increasingly linked from 2002 on. It was an encounter of two subtly different cultures, with for example quite different mathematical approaches. (Understandably, Tett, the former anthropologist, limits the more ethnographic aspect of her analysis to only one of those cultures, that surrounding CDOs.) The CDO world developed explicit and increasingly elaborate models of correlation – the ‘Gaussian copula’ that initially puzzled Tett is a correlation model – while the mortgage world handled the phenomenon entirely implicitly. In most investment banks, and also – as far as I have been able to discover – in the New York head offices of the rating agencies, separate groups or departments handled mortgage-backed securities and CDOs based on corporate debt. In the investment banks, for instance, those different departments seem to have had surprisingly little to do with each other. The two cultures never really merged; instead, the CDO, a structure invented by the corporate-debt world, was applied to the products of the mortgage world.

Members of both cultures now see the encounter as corrupting. ‘They’ – constructors of CDOs based on mortgage-backed securities – ‘took our tools’ and misused them, one specialist in corporate credit derivatives told me a few weeks ago. Those with a background in mortgage-backed securities blame CDOs (with some justice) for being indiscriminate buyers of those securities, concerned only with their

ratings and the spreads (increments over Libor) they offered. Two experienced industry observers, Mark Adelson and David Jacob,<sup>1</sup> suggest that the fatal point was when CDOs became the almost the only purchasers of the riskier tranches of mortgage-backed securities. Previously, those tranches were either guaranteed against default by specialist insurers, or bought by canny investors with their firms' own money at risk, who would carefully assess the risks involved. These insurers and investors acted as a brake on the riskiness of the lower tranches, and thus on the overall riskiness of mortgage-backed securities, and they demanded a healthy rate of return for taking on their risks. They were displaced by those buying tranches in order to package them into CDOs, who were prepared to buy them at lesser rates of return, and who cared a lot less about their riskiness, because those risks were going to be passed on to the investors in the CDOs.

With the brake removed, the construction of CDOs based on mortgage-backed securities became a fast-moving assembly line (participants frequently turn to machinic metaphors when describing the process). Brokers sold mortgages knowing that they could readily be sold on in the form of mortgage-backed securities. Instead of having to worry whether the couples sitting on the other side of their desks really had the wherewithal to keep up their payments, all that mattered was the dozen or so quantitative characteristics – such as borrowers' FICO (Fair Isaac Corporation) creditworthiness scores – that influenced rating agencies' mortgage models. The constructors of mortgage-backed securities no longer had to satisfy specialist insurers or experienced investors: CDOs had an apparently insatiable demand for those securities.

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<sup>1</sup> Their papers can be found at <http://www.adelsonandjacob.com/>

Essential to the assembly line was that the higher tranches of its final products – CDOs in which the underlying assets were mortgage-backed securities – be able to gain Aaa ratings. A critical issue was the likely correlation of mortgage-backed securities. Standard & Poor's, for example, used the same system, CDO Evaluator, that it employed for CDOs based on corporate debt, and it employed the same modest baseline correlation assumption, 0.3, for mortgage-backed securities that it initially used for corporations within the same industry. (S&P would later reduce this last figure, while increasing its assumption about cross-industry correlation. These baseline correlation figures could be increased by the analysts rating a specific CDO if it was highly concentrated in a particular industry or consumer-debt sector.) I haven't been able to ascertain the equivalent figures used by the other agencies, whose methods differed somewhat from Standard & Poor's, but the similarity of their ratings to S&P's suggest similar judgements. My focus is on S&P here simply because – commendably – it seems to have been more explicit than the other agencies in laying out in CDO Evaluator's publicly-available documentation these crucial assumptions underpinning how the system worked.

The choice of 0.3, or a number close to it, as the baseline was critical: one specialist has told me that even a moderate increase in the baseline correlation assumption, for example to 0.5, would have made many CDOs based on mortgage-backed securities much less attractive, perhaps even not economically viable. However, as far as I can discover, analysing CDOs built out of mortgage-backed securities using only modest correlation levels seems in general to have been uncontroversial. Certainly, the performance of mortgage-backed securities – which,

as noted above, had in general been better than that of corporate bonds – offered little reason to be more stringent when rating CDOs based on them. For example, S&P's statistical analyses suggested a correlation of mortgage-backed securities lower than 0.3; the latter figure was retained as a baseline because it was understood that the correlation would rise when economic conditions became less benign.

Had the world remained as it was in 2002, the agencies' assumptions and ratings might well have turned out to be perfectly appropriate. The trouble with an assembly line, though, is that it produces identical products. The only person outside of J.P. Morgan I've so far found who thought, at the time, that the correlation estimates being used to analyse CDOs of mortgage-backed securities were much too low had discovered this by accident. In a previous job as an auditor, he was checking the statistical tables that the sellers of mortgage-backed securities provide to prospective buyers. These tables show the breakdown of the underlying loans by state, FICO score, loan-to-value ratio, and so on. When checking the tables for one security, he inadvertently used the loan tape (the underlying mortgage data) for another, and found almost complete agreement. 'These deals' – apparently different mortgage-backed securities – 'were the same deal', he told me. Even geographical dispersion of the underlying mortgages across the US (a desirable feature when an individual mortgage-backed security was considered in isolation, because it reduced exposure to the vagaries of particular local housing market) had the paradoxical effect of increasingly the homogeneity of different mortgage-backed securities. In a situation of severe economic stress – falling house prices, rising unemployment – not just some of those securities would perform badly: they all would. Instead of correlation remaining modest, my interviewee came to fear that it would be nigh on

perfect.

Specialists in mortgage-backed securities in the US have not been entirely surprised at the fraud and malpractice in mortgage lending that has come to light: it was always present, and changed only in scale. (There had been an earlier US subprime crisis in the late 1990s, which only specialists seem to remember.<sup>2</sup> It was much more limited in its scale, but it revealed extensive over-optimistic accounting by lenders.) That mortgage defaults have risen, and the value of repossessed homes fallen, is not in itself surprising to specialists, although the size of the changes certainly is. At least some of them did begin to suspect that longstanding statistical relationships – for example between individuals’ credit scores and the risk of them defaulting on their mortgages – had ceased to be valid, but as far as I can tell that suspicion arose only in 2006, by which time the processes that led to the credit crisis were well underway. One problem, for instance, seems to have been that with individuals’ scores increasingly determining their access to credit and the rates of interest they had to pay, they found ways to manipulate those scores. A modest web-based industry developed which arranged (in return for fees of around \$1,000-\$2,000 per person) for people – in some cases, apparently dozens of people – with low credit scores to be added as ‘authorised users’ to the credit card account of someone with a high score and an impeccable payment record. Within one to three months, the benefits of the primary cardholder’s regular payments fed through into improvements in the credit scores of the card’s ‘renters’.

If, however, CDOs backed by mortgages had worked as the J.P. Morgan team

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<sup>2</sup> It is discussed in the final chapter of an excellent book that, while more limited in scope and more technical than Tett’s, deserves to be better known: Laurie S. Goodman et al., *Subprime Mortgage Credit Derivatives* (Wiley 2008, \$80.00, 978-0-470-24366-4).

had envisaged when designing Bistro, the losses to investors in those CDOs that the US housing bubble and its collapse have caused, though very large, would have been spread widely across the many institutions that bought the tranches of such CDOs. As Tett notes, what has shocked the members of that team – many of whom now work for other banks and hedge funds, but still stay in touch – is the concentration of such losses, especially at apparently sophisticated global banks such as Bear Stearns, Lehman Brothers, UBS, Citigroup, Merrill Lynch, Morgan Stanley and the Royal Bank of Scotland.

The primary vehicle by which risk was concentrated was Bistro's afterthought, the super-senior tranches of CDOs. Even the riskiest mortgage-backed CDOs – those that predominantly bought the 'mezzanine' (next-to-lowest) tranches of mortgage-backed securities – have super-senior tranches that are bigger than all the other tranches put together. These super-senior tranches were hard to sell to most outside investors, because the need for attractive returns on lower tranches means a super-senior tranche can offer only a slender increment over Libor. By 2005, Tett reports, that spread was as low as 15 basis points.

So many banks did as J.P. Morgan did with Bistro: they kept the super-senior tranches, sometimes insuring them via AIG or the specialist bond insurers. (Adelson and Jacob point out the resultant irony. Risks that the mortgage experts in the insurers would have charged heavily for or perhaps even declined were insured in packaged form in huge amounts – and quite cheaply – by different departments of the same firms.) If only a handful of deals had been insured in this way, it would have made perfect sense. As Tett notes, however, AIG insured super-senior tranches

totalling \$560 billion. Its bail-out by the US taxpayer dwarfs that of any bank, and as John Lanchester wrote in the *LRB* on 28 May, it keeps rising (the current total is \$173 billion), but AIG cannot be allowed to fail, because the loss of these crucial super-senior insurance contracts could bring much of the banking system down with it.

Perhaps most surprising of all, top banks also bought super-senior tranches originated by other banks. If you are a top bank, you can borrow at around Libor (that, after all, is what Libor means); if you are particularly well regarded, it may be possible to borrow at a rate a tiny bit lower than Libor. So you could borrow at Libor or below, buy a tranche that seemed safer than safe, and from it earn a slender spread over Libor. It looked like free money. It was especially tempting to traders whose banks ‘charged’ them for their use of capital, in the systems by which traders’ P&L (profit and loss) is measured, at around Libor, and credited them with the small additional spread that super-senior tranches offered. The slenderness of the spread meant that you had to do the trade on a very large scale to earn a really big bonus, so traders did just that.

As I’ve already indicated, the vulnerability of super-senior is correlation. Losses on uncorrelated assets are unlikely ever to impact on super-senior tranches. When correlation approaches 1.0, however, a CDO’s asset pool starts to behave like a single investment. It may suffer no defaults, or it may default effectively in its entirety. If the latter happens, even the super-senior tranche, safer than safe, is doomed.

As the US historian of economics Perry Mehrling points out, events in

financial markets cast their shadows ahead of them, not behind. What has haunted the banking system for the last two years is above all the shadow of the gigantic, system-wide default of the super-senior tranches of all the CDOs based on those US mortgage-backed securities issued towards the end of the bubble. (Residential mortgages have been the focus of most of the attention, but there are also lots of problems with commercial mortgages.) Although, alas, the losses will not stop there, most immediately at risk have been CDOs made up primarily of the mezzanine tranches of subprime mortgage-backed securities issued from late 2005 on. Defaults have risen enough, the value of repossessed homes has fallen enough, and the structure and composition of these securities has been similar enough, that as far as I can tell almost all such tranches have been or will be wiped out in their entirety. So if a CDO contains little else but such tranches, even its super-senior portion faces close-to-total losses. So far, only a limited part of those losses have actually been realised, but the banking system is braced for the rest of them – and, with the massive aid of taxpayers, it is hopefully now well enough capitalised to survive it and the other losses that sharp recession will bring.

Unfortunately, this analysis – that the crux of the problem has been not in CDOs per se but in the uncomfortable encounter between the world of CDOs and that of mortgage-backed securities – remains only a hypothesis. The world of corporate CDOs has itself manifested some of the phenomena of the mortgage CDO assembly line: increasingly risky loans were made to private equity firms and to other highly-indebted corporate borrowers because it was possible to package and sell on those loans in the form of CDOs. I've just come back from New York, where I questioned some of those I spoke to on the magnitude of the problems that may lurk below the

still comparatively quiet surface of this other sector of the CDO market, which, while not as large as as the mortgage sector, is still huge. My interviewees seem convinced that while the problems are real they do not approach the same scale: the amount of truly irresponsible lending to corporations was much smaller. I hope they are right.

At its heart, the tale Tett tells is a moral one. She believes that the history of the J.P. Morgan credit derivatives team shows that banking can be technically innovative while remaining responsible. Her readers may fear that the anthropologist has here simply gone native, but I don't think so. I have met a good number of those she is writing about, and have studied many of the events she has, and I largely share her judgement. In particular, J.P. Morgan's decision not to set up a mortgage CDO assembly line (despite Dimon at one point wanting one) has meant that the bank has not suffered the catastrophic losses that so many of its peers have; unlike theirs, its solvency has never been in doubt. It is too easy right now to condemn all of those who work at the heart of the financial system as either rogues or fools: for example, Tett reveals that Blythe Masters, who stands out because even today female senior bankers are relatively rare, gets hate mail. So Tett is right to emphasise that despite all the pressures and all the temptations, prudent banking was still practised – sometimes – even at the centre of history's largest-ever credit bubble.

*9 June*