

# A whale in shallow waters: JPMorgan Chase, the “London Whale” and the organisational catastrophe of 2012

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## **Abstract:**

The case of the so-called “London Whale” cost US bank JPMorgan Chase & Co. more than \$6bn. The hearings held by the United States Senate enabled this case to be carefully documented, and shed light on the errors committed by an organisation that believed it was implementing an innovative, profitable hedging strategy – but was actually taking risks that were significant and very poorly assessed.

In early April 2012, the financial press began to report on the activities of a London-based trader nicknamed the “London Whale” because he had taken enormous positions on shallow derivatives markets. As a result, his transactions were increasingly visible to his competitors – as if a whale were trapped in a small pool of water. Very rapidly, JPMorgan Chase was identified, and within JPMorgan Chase, a department in charge of carrying out risk-free investments of excess liquidity (the Chief Investment Office, CIO), and within the CIO, the individuals in charge of a Synthetic Credit Portfolio (SCP). It became known that JPMorgan Chase had stopped trading on the SCP at the end of March. This SCP had already lost \$2bn in May, with losses mounting to \$4.4bn in June and \$6.2bn at the end of 2012.

The London Whale case is one of the largest disasters to strike a bank in the past few years, and at the same time, it is a strange case for two reasons. The products involved are complex and hard to understand. Unlike the other unfortunate trading cases that have dotted the recent history of finance – from Barings to Société Générale to UBS – and also contrary to what is suggested by the term “London Whale”, the credit derivatives case at JPMorgan Chase had nothing to do with a dishonest trader. It is the story of a succession of bad collective decisions that led to a catastrophe. It is also the story of the interaction between a trendy financial product and a particular situation in a large banking organisation. What we know about this story mainly comes from the report of the US Senate Permanent Subcommittee on Investigations,<sup>1</sup> with its exhibits and testimony from the hearing, and to a lesser extent, from JPMorgan Chase's own report.<sup>2</sup>

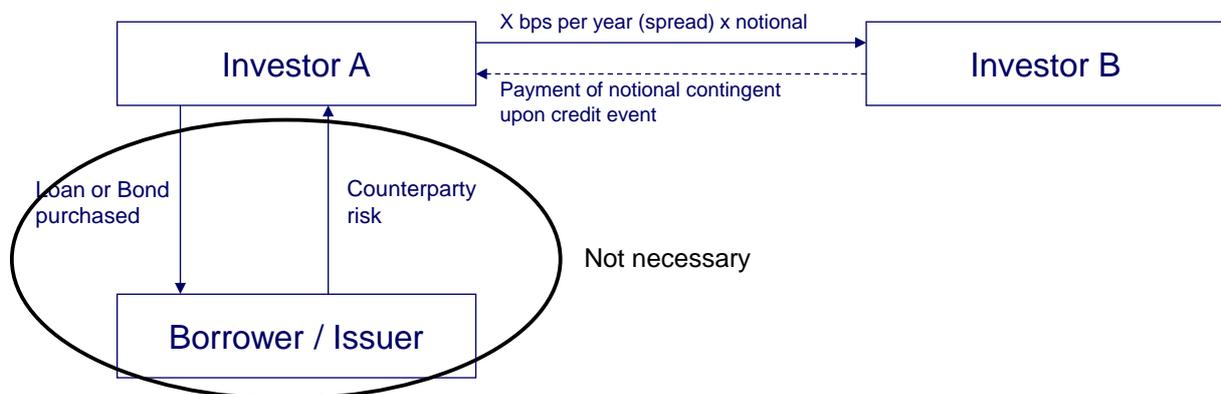
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<sup>(1)</sup> United States Senate Permanent Subcommittee on Investigations (2013), *JPMorgan Chase Whale Trades: a Case History of Derivatives Risks and Abuses*.

<sup>(2)</sup> JPMorgan (2013), *Report of JPMorgan Chase & Co. Management Task Force Regarding 2012 CIO Losses*.

The financial product involved was the credit default swap index (CDS index). A CDS is a swap agreement between a buyer of protection, which pays a periodical spread calculated in basis points (i.e. hundredths of a percent) on a notional bond of a specific issuer, and a seller of protection, who agrees to pay the full notional capital to the buyer of protection in the event of a credit event (in most cases, default). Most CDSs are quoted continuously, and their spreads reflect the change in the risk premiums that the market applies to the underlying bond issuers. These products are therefore correlated with the yield that the bond market demands of an issuer, without CDS market participants having to resort to the bond market (see Figure 1). The buyer of protection, who pays a spread fixed at the time of purchase, is betting that this spread will widen in the future, i.e. a deterioration in the market's risk perception of the issuer. Conversely, the seller of protection, who receives a spread fixed at the time of sale, is betting on a narrowing of this spread in the future, i.e. an improvement in the market's risk perception of the issuer.<sup>3</sup> In both cases, the anticipated profit is made when the position is unwound, in other words, when taking a reverse position allows the market participant to pocket the difference in the spreads.

Figure 1: The principle of credit default swaps (CDSs)



In the 2000s, CDSs became incredibly popular on the financial markets. The aggregate notional of all existing CDSs, i.e. the aggregate amount of all the bonds on which spreads are calculated, went from \$3 trillion to \$60 trillion in four years (from 2003 to 2007). Beginning with the crisis in 2008, the notional started to decline; it currently stands at only \$4 trillion. Several corporate banks used CDSs quite extensively in the years leading up to the 2008 crisis. They issued CDSs on collateralised debt obligations (CDOs), the securities backed by mortgages that turned the slowdown on the US housing market into a global financial and economic crisis. They also bought protection for these CDOs from a wide array of institutions.<sup>4</sup> AIG, the largest US insurer, sold so much protection that it required a massive bailout from the federal government, and BVP (the Berlin public transport company) had to plead to the courts that it was not financially competent in order to avoid paying JPMorgan Chase \$200m for a CDS in which BVP had sold protection to JPMorgan Chase.

<sup>(3)</sup> See F. Valérian (2016), "Crise bancaire en Islande et prophétie auto-réalisatrice: chronique d'une banqueroute annoncée (2006-2008)", *Annales des Mines, Réalités Industrielles* series, August.

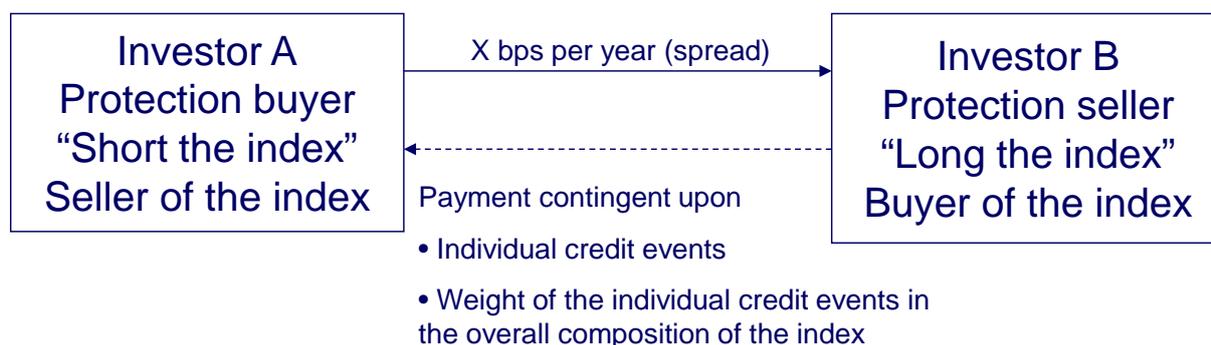
<sup>(4)</sup> On this topic, see notably: National Commission on the Causes of the Financial and Economic Crisis in the United States (2011), *The Financial Crisis Inquiry Report*, pp. 139-146.

For JPMorgan Chase and other mainly North American banks, in the mid-2000s, CDSs were a useful product that provided hedging or very high anticipated profit for the buying of protection, a steady stream of payments for the selling of protection, and trading profits with lower capital commitments than on the bond market. However, JPMorgan Chase was not the first American bank to resort to this product, and its use of CDSs before the crisis was less spectacular than Goldman Sachs in the case of AIG. In 2010, Goldman Sachs had to pay a costly penalty to the US authorities to settle the AIG case. JPMorgan Chase is a corporate bank, but also a commercial bank with sizeable deposits from its clients. Therefore, its management was presumably less inclined to risk-taking than at Goldman Sachs or Morgan Stanley before the crisis. However, in 2006, JPMorgan Chase's management decided to move to an overall hedging strategy for its lending activity. The Chief Investment Office (CIO) was made responsible for this hedging strategy. The CIO head reported directly to the president of JPMorgan, and until that point, her remit had been to cautiously invest some \$350bn in excess liquidities, representing the difference between bank deposits and loans made by the bank. Until 2006, these investments were mainly carried out by a New York-based team, in low-risk financial products such as Treasury bonds. The overall hedging of JPMorgan Chase's lending activity, now in the hands of the CIO, was turned over to a European team based in London and hired specifically for this purpose. As from 2007, this European team used the CDS index as the financial instrument for these investments.

Indeed, in 2007, financial services company Markit launched indices that enabled market participants to take positions on aggregate bond risk by sector, type of bond issuer or geographic region. These indices grouped together a large number of CDSs, each of which referred to a specific bond. With a CDS index – as with a CDS – an investor has two possibilities: buy or sell protection. The buyer of protection pays a spread to the seller of protection. In turn, in the event that one of the index constituents defaults, the seller pays the buyer an amount that is proportional to the constituent's weight in the index. In most cases, the spread is a fixed coupon determined when the index is launched, e.g. 60 basis points on a notional of 10,000, which is the index's initial value – but the value of the index changes over time. Therefore, if the index has risen from its initial value, then when a position is taken, the seller of protection pays the buyer of protection the difference between the current value of the index and its initial value. If the index has declined from its initial value, the opposite occurs: the buyer of protection pays the seller of protection the difference between the initial value of the index and its current value.

So we clearly see that the seller of protection is interested in the index going up, because then the seller profits when unwinding the position and becoming a buyer of protection. Conversely, the buyer of protection is interested in the index going down, because then the buyer profits when unwinding the position and becoming a seller. We say that the seller of protection is “buying the index” (or going long on the index) and the buyer of protection is “selling the index” (or shorting the index; see Figure 2). This functions as if the buyer of the index/seller of protection were buying a basket of bonds, while the seller of the index/buyer of protection shorted a basket of bonds. However, the amount of capital committed is much lower than for direct intervention on the bond market.

Figure 2: The principle of a CDS index, or credit derivative index



It is fairly easy to understand that there is a theoretical – and in most cases real – link between the CDS or CDS index market and the bond market. Both kinds of markets are governed by the same bond risks, and arbitrage can therefore only coordinate the upward/downward movements of a CDS index, on one hand, with the movements of the underlying bonds for the CDSs that make up the index, on the other hand. However, the value of the index moves with the supply and demand for the index, under a mechanism shared by nearly all listed financial assets. The link established by arbitrage only functions properly on markets that are deep enough to have buyers and sellers across an almost continuous price range. When a market has too few participants, a value can rise or fall substantially because not all buy or sell orders can be matched. In the late 2000s, four US banks alone held 90% of the CDS and CDS index market; JPMorgan Chase was the largest market participant. The CDS index market was shallow and therefore harboured substantial counterparty risk.

This particular feature of the market was neglected by JPMorgan Chase's teams when they received New Business Initiative Approval (NBIA) in spring 2006. This NBIA authorised them to take CDS positions to hedge the bank's cyclical credit exposure. The CDS index trading activity was launched in early 2007.<sup>5</sup> This gave rise to a portfolio of CDS index positions. This initially modest-sized portfolio was named the SCP in 2008. That year, the SCP's "notional", i.e. the aggregate amount used for the calculation of the spreads and the payments in the event of default, was \$4bn. Albeit not a meagre sum, this would only lead to maximum losses of a few tens of millions of dollars, i.e. a few percentage points of the notional – barring a market catastrophe.

<sup>(5)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, Exhibits 4 and 91.

In summer 2008, the CIO's strategy shifted. Initially, this strategy was focused on hedging and was therefore supposed to be cautious, even though the notion of hedging overall exposure to credit risk was vague because it was not implemented per security with a reduction in volatility that could be calculated for each individual risk. In July 2008, an additional factor made the CIO's trading activity more speculative, with the launch of a programme that benefited from large-scale defaults by high-risk issuers.<sup>6</sup> Here, the aim was to buy protection on CDS indices with higher-risk constituents whose bond rates were higher. The spread paid for the protection was higher than on other indices, but there was a higher probability of default by one of the index constituents, with a very high gain for buyers of protection. This strategy was not focused on hedging because it did not necessarily correspond to the purchase of bonds from the same issuers included in the index. But as a speculative strategy, its implementation was decided at an extraordinarily opportune moment, just a few months before the financial and economic crisis broke out in late 2008 and sharply increased the probabilities of default. JPMorgan Chase's strategy was coherent with its (and other corporate banks') purchases of CDO default protection.

In 2009, this strategy paid off. More specifically, one position paid off, but thanks to the structure of CDSs and their indices, a single gain is enough to make the full year very profitable. In June 2009, General Motors filed for bankruptcy. The SCP held a short position (i.e. was a buyer of protection) against a default by the US carmaker, and the CIO team turned a profit of over a billion dollars in 2009, compared with \$170m in 2008.<sup>7</sup>

Although the CIO's activity became more speculative, JPMorgan Chase's management did not regard it as such. In 2009, the crisis heightened the imbalance between loan outstandings and bank deposits, with a reduction in outstandings and a need to find low-risk investments for excess deposits. This was the CIO's assignment, and it received additional resources to grow its portfolio of positions in CDS indices.

Available sources seem to indicate that the SCP shrank in 2010. The CIO head was on medical leave for much of the year, and tensions ran high between the very risk-averse New York office and the London office, which managed the SCP.<sup>8</sup> Last but not least, the general economic context improved, credit risk diminished and the need for overall hedging against credit risk was less pressing. In January 2010, the bank made the decision to reduce the SCP. This process began in June 2010, but it was limited by the tension between the SCP's two goals, which were never indicated in a single document and therefore do not seem to have ever been reconciled: while the SCP acted as an overall hedge, it was also used to reserve the possibility of making substantial gains in the event of defaults. At the end of 2010, the SCP was maintained due to the latter goal.<sup>9</sup>

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<sup>(6)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, Exhibit 91.

<sup>(7)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, Senate Hearings, volume 1, p. 215.

<sup>(8)</sup> S. Dominus (2012), "The Woman Who Took the Fall for JPMorgan Chase", *The New York Times Magazine*, 3 October.

<sup>(9)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, p. 50.

This speculative goal also took precedence in 2011. In late 2010, the CIO head staunchly defended the SCP's governance to the inspectors of the OCC (Office of the Comptroller of the Currency), the US derivatives regulator, and emphasised that the investment decisions were made with the full understanding of the bank's management, up to its president.<sup>10</sup> Annual staff appraisals in early 2011 showed the importance of the potential sizeable gains from the SCP's trading activity: the main trader was encouraged to generate additional gains on defaults by risky issuers, and at the top of the pyramid, the CIO head suggested that the head of the London office could one day take over her position and thus win the battle against the New York office.<sup>11</sup> Beginning in June 2011, the credit markets worsened again, notably due to the euro area crisis. The CIO viewed this deterioration as an opportunity for further gains – similar to the 2009 gain on the General Motors default. The SCP changed scale, with a 12-fold increase in its notional, going from \$4bn to \$51bn in 2011. The strategy of buying protection/selling the indices strengthened in the autumn and was ultimately crowned with success: American Airlines filed for bankruptcy in November 2011, bringing in around \$400m for the CIO.

In December 2011, the CIO was again caught between its speculative and overall hedging goals. The CIO's management asked its traders to repeat their American Airlines performance, because the CIO liked “cheap options”.<sup>12</sup> However, within JPMorgan Chase's top management, questions resurfaced regarding the bank's interest in keeping such a portfolio of CDS index positions, for two reasons:<sup>13</sup> the improvement in market conditions made protection strategies less necessary, while the forthcoming new Basel 2.5 capital requirement ratios made it necessary to reduce risk-weighted assets, including the SCP's positions.

The CIO head then asked her traders to estimate the costs of unwinding the CIO's positions. The answer came on 29 December in a table with various options depending on what proportion of the portfolio would be unwound. The highest estimate was that it would cost \$516m to unwind 35% of the portfolio. The head of the CIO then asked the traders to see if it was possible to reduce risk-weighted assets without holding a “fire sale”.<sup>14</sup>

This discussion within the CIO, at the very end of 2011, was a turning point in the history of this department and its credit derivatives portfolio, and the beginning of a catastrophic turn for the worse. The reason why the costs of unwinding the positions were very high – a reason not mentioned in the internal emails and documents – was because the CDS index market was very shallow. If four institutions held 90% of a market, and the largest participant were to begin to unwind its positions, e.g. by going long on the index whereas it had been short on the index and a buyer of protection, then its new long positions would substantially increase the price of the indices, forcing the participant to offer very high prices to find a counterparty, or encouraging the other rival institutions not to act as a counterparty until a very high price level was reached, i.e. at a very high level of losses for the buyer. One possible course of action for the CIO as a whole would have been to

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<sup>(10)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, Exhibit 70.

<sup>(11)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, Senate Hearings, volume 2, p. 2008.

<sup>(12)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, p. 63.

<sup>(13)</sup> *Ibid.*, pp. 52, 60 and 61.

<sup>(14)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, Senate Hearings, volume 1, p. 229.

recognise the collective error of taking such massive positions on such a small market, and to implement the difficult, costly strategy of reducing or eliminating this portfolio. In that case, the bank's management and president would have had to be told that a strategy previously presented, and regarded for several years, as being safe and sometimes highly profitable was in fact very risky because it could not be reversed without probably costing more than all the gains of previous years.

On a collective level, from the CIO head all the way down to the traders in London, this is not what the CIO decided to do. The strategy implemented from January 2012, and largely defined by the London-based traders due to its complexity, was to attempt to reduce the amount of risk-weighted assets by adding long index positions to the primarily short index positions, while reserving the possibility of buying protection on a high bond risk in hopes of another default.

In January, an event occurred that thwarted the traders' strategy and worried them. On 19 January, Eastman Kodak filed for bankruptcy, whereas the CIO had gone long on an index that contained the Eastman Kodak CDS. This was the opposite of the General Motors and American Airlines defaults; JPMorgan Chase had to pay out the notional capital instead of receiving it, making a loss of around \$50m.<sup>15</sup> This event sparked concern because it seemed to challenge the strategy of adding long index positions, in addition to a more basic worry about the bond market trend. The global economic situation began to improve considerably in early 2012, the equity markets returned more or less to their pre-crisis peaks of 2008, and correlatively, the bond markets showed lower rates and higher bond prices. As a result, CDS spreads narrowed and CDS indices rose. However, changes in the fair value of long/short index positions had to be recorded in the bank's books on a daily basis. The overall narrowing of spreads in early 2012 was greater in magnitude than the bank had experienced since creating its SCP. The shape of this portfolio, which was still mainly short on the index/buyer of protection, suffered from this narrowing, and losses began to accumulate: \$50m in January in addition to the \$50m for Eastman Kodak, then \$69m in February.

Apparently, the traders in London then implemented a very complex strategy, playing on the maturities of the various reference bonds of the indices in an attempt to turn the situation around, and also fought against the rise in indices by selling even more protection. As a result, the SCP's notional rose from \$51bn in early January to \$157bn at the end of March. If we apply a few percentage points to this amount, we immediately see that the portfolio's potential losses, albeit small in early 2011 when the notional was forty times smaller, had climbed to several billion dollars.

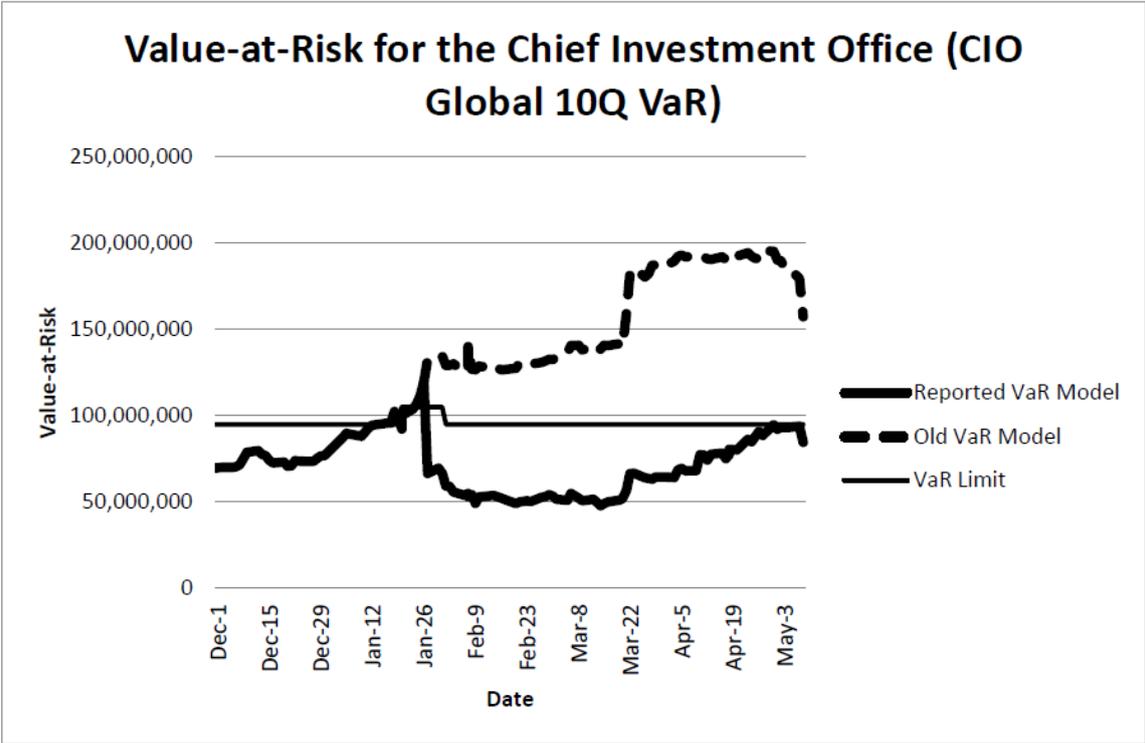
Banks have techniques in place to prevent their various departments from taking on too much risk. For the past two decades, the main technique has been to calculate Value at risk (VaR), i.e. the worst loss that a given portfolio would be likely to suffer over a certain period of time and with a given probability. The calculation of VaR depends on the statistical distribution, which is a function of the portfolio's characteristics and the past performance of its constituents. Because CDS indices were very new, it was difficult to calculate a VaR for them. With the VaR model used when the SCP received internal approval, the portfolio would have largely breached its VaR limit in January 2012. However, beginning in mid-2011,

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<sup>(15)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, p. 65.

the CIO had decided to convince JP Morgan Chase's risk division that a new VaR model should be adopted. This model would be less penalising for the SCP. This new model was implemented in late January 2012, and as a result, the SCP's notional could be expanded without breaching the limit (as shown in Figure 3).

Figure 3: Value at Risk of the Synthetic Credit Portfolio, under the old and new calculation models



Source: Subcommittee chart created from data provided by JPMorgan Chase, JPMC-Senate/Levin 000155-6.

However, the massive sell orders, intended to widen spreads and lower the value of the indices, ran up against the shallow CDS index market. By March 2012 at the latest, the few other banks on this market had identified that JPMorgan Chase was behind these movements, and obviously they were in no hurry to buy, which limited the number of transactions. JPMorgan Chase's traders were unable to counter the underlying bond market trend, and by expanding their portfolio, they merely increased their losses. First-quarter losses came to \$719m, and on 23 March, the CIO head instructed the traders to hang up their phones – in other words, to halt all trading.<sup>16</sup>

Nevertheless, the existing positions in the portfolio continued to lose money after trading was stopped, and after the positions were unwound, total losses stabilised in September 2012 at \$6.2bn.

<sup>16</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, op. cit., p. 85; JPMorgan, *Report of JPMorgan Chase...*, op. cit., p. 45.

The US authorities prosecuted JPMorgan Chase, as well as several traders from various levels of the CIO hierarchy, for failure to provide information on the characteristics of the products used before 2012 and on the losses suffered in early 2012, as well as on the methods used to book these losses.

Aside from these court cases (some of which are still ongoing), we can draw a few conclusions from this case with respect to bank governance. The complexity of the products and their markets obviously raises an issue, as there were not many people at JPMorgan Chase who could understand the risks related to what was presented as mainly a hedging activity. This low level of understanding hampered the internal VaR discussions, which inevitably turned out in favour of the team that wanted to continue trading. Lastly, the stubborn determination of the various levels of the CIO hierarchy to continue trading in 2012, even though the costs of possibly unwinding the portfolio had been known since December 2011, can be viewed in light of both the remuneration of the main participants in 2011 (ranging from \$6.8m to \$14.5m<sup>17</sup>), and the often proved observation that the more money you earn, the more you are afraid of losing your job.

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<sup>(17)</sup> United States Senate Permanent Subcommittee on Investigations, *JPMorgan Chase Whale Trades...*, *op. cit.*, Exhibit 1h.