

THE ESSENTIALS OF RISK MANAGEMENT

Third Edition (EoRM3)

ONLINE CONTENT FOR CHAPTER 15

Box 15-1, Figure 15B-1, Box 15-2, and Box 15-3 of EoRM2

From pp. 530–534 of *The Essentials of Risk Management, Second Edition (EoRM2)*

BOX 15-1

MODEL RISK AND GOVERNANCE: THE LONDON WHALE

During the first half of 2012, JPMorgan Chase lost billions of dollars from exposure to a massive credit derivative portfolio. We compiled this case study of the event using word-for-word extracts from the 300-page report produced by a subsequent Senate investigation.*

Setting the Scene

“JP Morgan Chase & Company is the largest financial holding company in the United States, with \$2.4 trillion in assets. It is also the largest derivatives dealer in the world and the largest single participant in world credit derivatives markets. Its principal bank subsidiary, JP Morgan Chase Bank, is the largest U.S. bank. JP Morgan Chase has consistently portrayed itself as an expert in risk management with a ‘fortress balance sheet’ that ensures taxpayers have nothing to fear from its banking activities, including its extensive dealing in derivatives. But in early 2012, the bank’s Chief Investment Office (CIO), which is charged with managing \$350 billion in excess deposits, placed a massive bet on a complex set of synthetic credit derivatives that, in 2012, lost at least \$6.2 billion.

“The CIO’s losses were the result of the so-called ‘London Whale’ trades executed by traders in its London office—trades so large in size that they roiled world credit markets. Initially dismissed by the bank’s chief executive as a ‘tempest in a teapot,’ the trading losses quickly doubled and then tripled despite a relatively benign credit environment . . .”†

The Risk Exposure Grows

“ . . . In 2006, the CIO approved a proposal to trade in synthetic derivatives, a new trading activity. In 2008, the CIO began calling its credit trading activity the Synthetic Credit Portfolio (SCP).

* United States Senate Permanent Subcommittee on Investigations, Carl Levin, Chairman and John McCain, Ranking Minority Member, “JP Morgan Chase Whale Trades: A Case History of Derivatives Risks and Abuses,” March 15, 2013, Hearing. For the company’s own account of the debacle, see *Report of JPMorgan Chase & Co Management Task Force Regarding 2012 CIO Losses*, January 16, 2013.

† Senate report, p. 1.

“Three years later, in 2011, the SCP’s net notional size jumped from \$4 billion to \$51 billion, a more than tenfold increase. In late 2011, the SCP bankrolled a \$1 billion credit derivatives trading bet that produced a gain of approximately \$400 million. In December 2011, JP Morgan Chase instructed the CIO to reduce its Risk Weighted Assets (RWA) to enable the bank, as a whole, to reduce its regulatory capital requirements. In response, in January 2012, rather than dispose of the high risk assets in the SCP—the most typical way to reduce RWA—the CIO launched a trading strategy that called for purchasing additional long credit derivatives to offset its short derivatives positions and lower the CIO’s RWA that way. That trading strategy not only ended up increasing the portfolio’s size, risk, and RWA, but also, by taking the portfolio into a net long position, eliminated the hedging protections the SCP was originally supposed to provide.”*

Operational Risk: Hiding Losses

“In its first four years of operation, the SCP produced positive revenues, but in 2012, it opened the year with sustained losses. In January, February, and March, the days reporting losses far exceeded the days reporting profits, and there wasn’t a single day when the SCP was in the black. To minimize its reported losses, the CIO began to deviate from the valuation practices it had used in the past to price credit derivatives. In early January, the CIO had typically established the daily value of a credit derivative by marking it at or near the midpoint price in the daily range of prices (bid-ask spread) offered in the market place. Using midpoint prices had enabled the CIO to comply with the requirement that it value its derivatives using prices that were the ‘most representative of fair value.’ But later in the first quarter of 2012, instead of marking near the midpoint, the CIO began to assign more favorable prices within the daily price range (bid-ask spread) to its credit derivatives. The more favorable prices enabled the CIO to report smaller losses in the daily profit/loss (P&L) reports that the SCP filed internally within the bank.”†

“... by March 16, 2012, the SCP had reported year-to-date losses of \$161 million, but if midpoint prices had been used, those losses would have swelled by at least another \$432 million to a total of \$593 million.”‡

“... One result of the CIO’s using more favorable valuations was that two different business lines within JP Morgan Chase, the CIO and the Investment Bank, assigned different values to identical credit derivative holdings. Beginning in March 2012, as CIO counterparties learned of the price differences, several objected to the CIO’s values, resulting in collateral disputes peaking at \$690 million. In May, the bank’s Deputy Chief Risk Officer ... directed the CIO to mark its books in the same manner as the Investment Bank, which used an independent pricing service to identify the midpoints in the relevant price ranges. That change in valuation methodology resolved the collateral valuation disputes in favor of the CIO’s counterparties and, at the same time, put an end to the mismarking.”§

Corporate Governance: Poor Risk Culture

“In contrast to JP Morgan Chase’s reputation for best-in-class risk management, the whale trades exposed a bank culture in which risk limit breaches were routinely disregarded, risk metrics were

* Senate report, pp. 3–4.

† Senate report, p. 96.

‡ Senate report, p. 96.

§ Senate report, p. 6.

frequently criticized or downplayed, and risk evaluation models were targeted by bank personnel seeking to produce artificially lower capital requirements.

“The CIO used five key metrics and limits to gauge and control the risks associated with its trading activities, including the value-at-risk (VaR) limit, Credit Spread Widening 01 (CS01) limit, Credit Spread Widening 10% (CSW10%) limit, stress loss limits, and stop loss advisories. During the first three months of 2012, as the CIO traders added billions of dollars in complex credit derivatives to the SCP, the SCP trades breached the limits on all five risk metrics. In fact, from January 1 through April 30, 2012, CIO risk limits and advisories were breached more than 330 times.”*

“... The SCP’s many breaches were routinely reported to JP Morgan Chase and CIO management, risk personnel, and traders. The breaches did not, however, spark an in-depth review of the SCP or require immediate remedial actions to lower risk. Instead, the breaches were largely ignored or ended by raising the relevant risk limit.”†

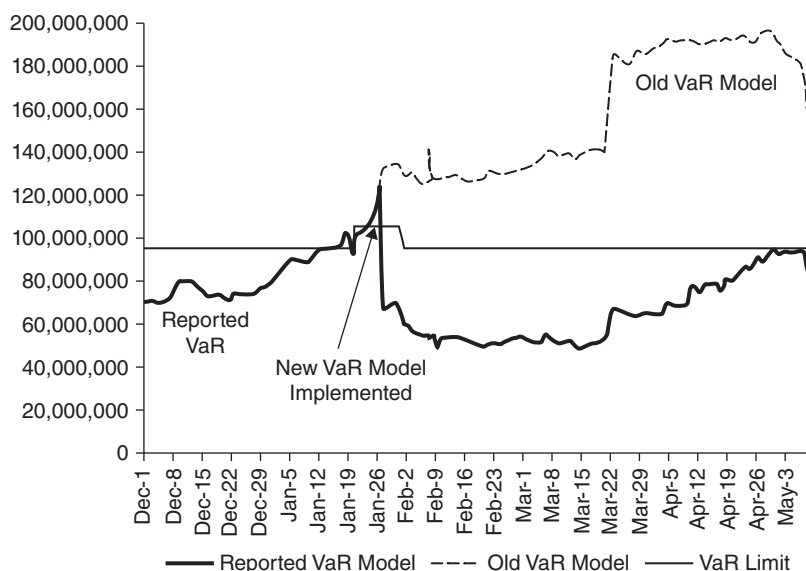
Model Risk: Fudging VaR Models

“... CIO traders, risk personnel, and quantitative analysts frequently attacked the accuracy of the risk metrics, downplaying the riskiness of credit derivatives and proposing risk measurement and model changes to lower risk results for the SCP. In the case of the CIO VaR, after analysts concluded the existing model was too conservative and overstated risk, an alternative CIO model was hurriedly adopted in late January 2012, while the CIO was in breach of its own and the bankwide VaR limit. The bank did not obtain OCC approval as it should have to use the model for the SCP. The CIO’s new model immediately lowered the SCP’s VaR by 50%, enabling the CIO not only to end its breach, but to engage in substantially more risky derivatives trading. Months later, the bank determined that the model was improperly implemented, requiring error-prone manual data entry and incorporating formula and calculation errors. On May 10, the bank backtracked, revoking the new VaR model due to its inaccuracy in portraying risk, and reinstating the prior model.”‡ (See Figure 15B-1.)

* Senate report, p. 7.

† Senate report, p. 7.

‡ Senate report, pp. 7–8.

FIGURE 15B-1 Value-at-Risk for the CIO: “Old” vs. “New” VaR Model*

* Source: United States Senate, Permanent Subcommittee on Investigations, Exhibits, Hearing on JP Morgan Trades: A Case History of Derivatives Risks and Abuses, March 15, 2013, p. 18.

From pp. 537–538 of *The Essentials of Risk Management, Second Edition (EoRM2)*

BOX 15-2

WRONG ASSUMPTIONS: THE NIEDERHOFFER PUT OPTIONS EXAMPLE

A well-established hedge fund run by Victor Niederhoffer, a star trader on Wall Street, was wiped out in November 1997.* The fund had been writing a large quantity of naked (i.e., uncovered), deeply out-of-the-money put options on the S&P 500 stock index, and collecting small amounts of option premium in return. Niederhoffer's trading strategy was based on the premise that the market would never drop by more than 5 percent on a given day. On October 27, 1997, the stock market fell by more than 7 percent in reaction to the crisis brewing in the Asian markets. (Such a fall would be virtually impossible if market returns were indeed normally distributed.) Liquidity, or rather the disappearance of liquidity after the market shock, brought the fund to its knees, and it found itself unable to meet margin calls for more than \$50 million. As a consequence, Niederhoffer's brokers liquidated the positions at fire-sale prices, and the entire equity of the fund was lost.

* See *Derivatives Strategy* 3(1), 1998, pp. 38–39.

From pp. 542 of *The Essentials of Risk Management, Second Edition* (EoRM2)**BOX 15-3****WRONG RATE INPUT: THE MERRILL LYNCH EXAMPLE**

In the mid-1970s, the Wall Street investment firm Merrill Lynch began to break down (or “strip”) 30-year government bonds into their building-block components: coupon annuities and zero-coupon principal payments. It then offered these components to the market as “interest only” (IO) and “principal only” (PO) instruments.

Merrill used the 30-year par yield to price the IOs and the POs. The par yield curve was higher than the annuity yield curve, but lower than the zero-coupon curve. Therefore, by using the par rate rather than the annuity rate, the firm undervalued the IOs, and by using the par rate rather than the zero-coupon rate, it overvalued the POs, although the sum of the two valuations did add up to the bond’s true value. Merrill sold \$600 million of the undervalued IOs and none of the overvalued POs.

Meanwhile, the Merrill Lynch trader hedged the 30-year bonds using a duration of approximately 13 years. This was the correct decision for the bonds as long as the entire bond remained intact on the books of Merrill Lynch. However, even after all the IO components of the bonds were sold, the trader maintained the hedge at 13 years, whereas the correct duration of a 30-year PO instrument is 30 years. When interest rates rose, the firm incurred severe losses. In combination with the misvaluations, this hedging mistake resulted in the firm booking a \$70 million loss.