OPERATIONAL LOSSES: LESSONS FROM SEVEN OF THE LARGEST ROGUE TRADING EVENTS IN HISTORY

by

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ABSTRACT

PATRICIO LEONEL MORAT. Operational losses: Lessons from seven of the largest rogue trading events in history. (Under the direction of DR. ROB ROY MCGREGOR)

Operational risk is the risk of losses arising from the failure of people, processes, and systems, and from external events. A general opinion is that, unlike market risk and credit risk, operational risk is idiosyncratic in the sense that when it manifests in one firm, it does not spread to other firms. This view implies the absence of contagion and that operational risk is firm-specific, not systemic, but there is some new evidence from the Federal Reserve Bank (FRB) that suggests frequencies track both firm and macro variables.

Until the emergence of the "Basel 2" reforms to banking supervision in the mid to late 90s, operational risk was largely an afterthought because these uncertainties were difficult to quantify, insure against, and manage in traditional ways. The last 15 years have witnessed the rapid emergence of operational risk from this low status to its institutionalization as a key component of enterprise risk management and global banking regulation. Some authors find it tempting to regard Nick Leeson, the "rogue" trader attributed with the destruction of the legendary Barings bank in 1995, as the true inventor of "operational risk."

The magnitude of loss and the impact of operational risk and losses to date are difficult to ignore. We have seen an increase in the number of large operational losses during times of economic stress. The times of market and economic stress magnify the severity of the large operational losses and lead to the eventual unraveling of the losses in the public eye.

The research reveals a significant number of similarities between the cases of rogue trading. These results support the hypothesis that failures both internal and external to the companies analyzed facilitated the emergence of rogue trading activities, specially driven by fragmented control environments and incentive schemes undermining financial institutions' risk culture.

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CHAPTER 1: INTRODUCTION

Background

The purpose of this research is to examine some of the largest rogue trading events in history from an operational risk management perspective. A deep review of rogue trading cases has prompted the need to understand what role risk culture played in facilitating these losses.

Because of the financial crisis of 2007-2008, there has been an industry-wide effort to more effectively manage risk culture, driven by continuing high-profile conduct failings and growing pressure from regulators, consumers, and shareholders to tighten controls on risk behavior.

Tim Geithner, Secretary of the United States Treasury, said he realized Merrill Lynch's risk culture was not in great shape when John Thain, then chief executive, did not know the name of his chief risk officer – who at the time was sitting next to him. The anecdote demonstrates a truth that is in danger of being lost in the regulatory clamor for banks to hold even more capital: that the driver for bank failure is not insufficient capital but rather a bad "risk culture."[1]

[1] Samuels, Simon. *"A culture is more important than a capital one."* Financial Times, November 24, 2014.

Rogue trader events have been the largest operational events for the banking industry (high severity, low frequency). See Table 1 for a comparison of severity and frequency combinations for different industries.

Table 1: Operational event examples – rogue traders in perspective[2]

OPERATIONAL EVENT EXAMPLES				
	INSURANCE	**BANKING**	**MINING**	**ENERGY**
Low Severity, High Frequency	Claims processing, data errors	ATM failures	Transport service interruption	Meter reading errors
Medium Severity, Medium Frequency	Fraud, regulatory compliance failure	Online security breach	Environmental contamination	Environmental contamination
High Severity, Low Frequency	Mis-selling, mis-pricing	Rogue trader	Mine collapse	Oil spill, gas plant fire

Definition

A good working definition of rogue trading can be given as follows: "*Trading activity that undertakes speculative and unprotected one-way trading positions (naked trading – without or with inadequate hedging positions), with the aim of creating large profits once the market moves in favor of the position. Typically, fraudulent activity is undertaken to hide the one-way nature of the trade by manipulating internal controls and systems. The frequency of this fraudulent activity increases when the markets move in an unfavorable way to the position, in an attempt to mask actual P&L losses, until a time when the market moves too far in an unfavorable way, thus exposing the position.*"[3]

Rogue trading does include intentional mis-marking of positions; trading of positions and products without authorization, breaching agreed trading desk mandates and failure to report breaches to supervisors; buy-to-cover (when a legitimate trade goes into

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[2] *Corrigan, Joshua, Luraschi, Paola. "Operational risk modelling framework." Milliman Research Report, February 2013, pp. 13. http://www.milliman.com/uploadedFiles/insight/life-published/operational-risk-modelling-framework.pdf*

[3] ORX (Operational Risk Exchange) Association Scenario Program, ORX Driver Workbook: Rogue Trading, December 11 2014, pp.3

loss territory and the trader tries to cover losses using unauthorized trading activity); manipulation of trading systems to hide trades; and use of suspense accounts to book losses or fake trades. It does not include other types of unauthorized activity (tax evasion and bribery, opening and closing or altering accounts, transferring funds; transferring cash from branch to branch, performing any transaction in a manner that does not comply with internal policies and procedures; approval or processing of transactions or accounts where you have a personal connection; securities fraud (stock fraud and investment fraud, stock manipulation, embezzlement by stockbrokers, offers of risky investment opportunities, misstatements on financial records, insider trading, front running); or corporate/market misconduct ("pump-and-dump" and other forms of market manipulation, scalping via "stock picks of the month", accounting fraud, naked short selling, spreading of false information in the form of "short and distort", or Ponzi schemes).

Neil Roth, a long time operational risk professional, provides a very simple but powerful definition: *"A "Rogue Trader" is someone who trades either a specific product without authorization, or an amount without authorization. Most rogue trades involve a limit violation of some sort, where the trader has exceeded a specific $ amount. In most cases, the rogue trader will attempt to conceal the unauthorized trades."*[4]

Rogue trading is not in and of itself illegal - it's a violation of company policies and procedures. However, many of the things that accompany rogue trading (such as accounting fraud, forged documents, and destroyed records) are illegal. When a rogue trader goes to jail, it's usually because of these things.[5]

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[4] Roth, Neil, Oversight of Operational Permanent Control, BNP Paribas. *OpRisk North America 2012 conference*. March 22, 2012.
[5] Roth, et al., 2012.

History

Rogue traders are not a new phenomenon. As early as 1884, two rogue traders at the U.S. company Grant & Ward caused a panic by illegally using as collateral securities that had already been posted as collateral for margin purposes. The company went bankrupt upon discovery of the fraudulent activity, resulting in liabilities of more than $16 million on assets of only $7 million. More recent rogue trader scandals have generated an equal amount of publicity and panic, causing billions of dollars in losses of firm capital, plus reputational and regulatory losses to the firms affected.

Factors that make banks fertile ground for rogue trading

Incentive Schemes that Undermine a Bank's Risk Culture

The financial industry has been compromised by a system of asymmetric incentives, whereby the people who benefit the most from increasing the bank's risk profile[6] do not bear the losses when the bets backfire. The agency problem is acute in financial institutions where compensation practices do not align employees' interests with the interests of depositors, equity holders, and debt holders.

Bad incentives drive bad behavior and thus increase operational risks. It comes as no surprise that of the ten largest operational risk losses reported in the first quarter of 2008, six were related to inappropriate behavior. These were due to internal fraud or theft, unauthorized activity, improper business practices, a lack of disclosure, or some combination of these factors. The incentives observable take different forms in the case

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[6] Per Financial Stability Board (Financial Stability Board, Principles for an Effective Risk Appetite Framework, November 13th, 2013), Risk Profile *"Point-in-time assessment of the financial institution's gross and, as appropriate, net risk exposures (after considering mitigants) aggregated within and across each relevant risk category based on forward-looking assumptions."*
http://www.fsb.org/2013/07/r_130717/

of retail and capital markets. We are interested in rogue trading, so we will be focusing on the capital market cases.

The financial crisis has once again underscored the dangers associated with excessive risk taking by financial institutions. It has also provided the motivation for revising compensation incentives, which influences the risk-taking activities that led to the market disruptions. Despite good intentions, banks and regulators have made little progress in dealing with the compensation issue. Competition for talent is intense in the banking world, and the best talent is known to gravitate toward less restrictive, more lucrative environments. Furthermore, the compensation issue is complex, and it involves a range of issues such as the following: front office compensation packages are mostly based on short-term volume targets; bonuses are paid in cash, shares, and options, but star performers usually negotiate more cash upfront; and many compensation structures have asymmetrical rewards, for instance, employees receive significant bonuses when earnings are high but suffer significantly less when losses occur. Most important, however, is the difference in compensation for trading and control staff (Figure 1), as front office compensation is several times larger than compensation for the controlling functions, like product control and market or credit risk.

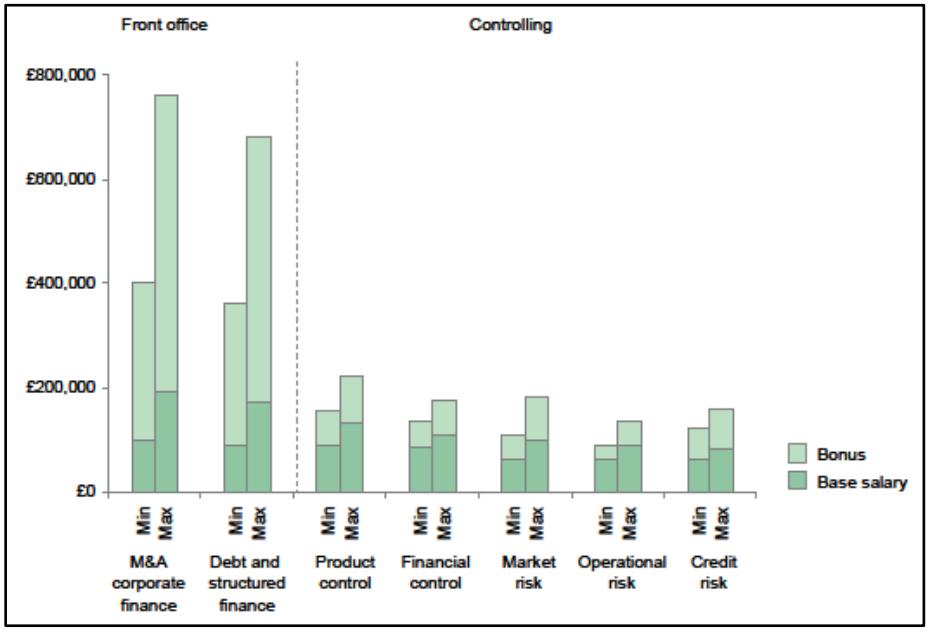

Figure 1: Incentive schemes – front office vs controlling staff[7]

A Fragmented Control Environment[8]

The significant demands imposed by recent regulations like Sarbanes-Oxley, Basel II/III, Dodd-Frank, and a multitude of local regulations have led to a spread of control requirements. The imposition of too many controls has created a fragmented environment hindered by duplication and redundancies, unclear roles and responsibilities, and a general inability to generate an integrated view of risk. It has also created a false sense of protection, which diminishes risk awareness across organizations.

[7] Pourquery, Pierre, De Mulder, Johan. *"Operational Risk Management – Too Important to Fail."* Boston Consulting Group, February 2009, pp.6.

[8] Per Deloitte: "Control Environment is the set of standards, processes, and structures that provide the basis for carrying out internal control across the organization. The board of directors and senior management establish the tone at the top regarding the importance of internal control including expected standards of conduct." *https://www2.deloitte.com/ng/en/pages/audit/articles/financial-reporting/coso-control-environment.html*

Many rogue-trading incidents can be traced back to risk controls rather than to the complete absence of defenses. Banks tend to focus more on quantity than quality of risk controls. As a consequence, banks end up with a complex and costly control structure that is sufficient for day to day problems but extremely exposed to extreme stress. More often than not, the failure to adequately apply controls stems from systemic issues, including cybersecurity, IT outages or business continuity failures, or outright intimidation of back-office staff by traders.

Additional problems have surfaced from the normalization of the deviance of controls. This notion, described by Diane Vaughan[9], is characterized by the fact that insiders, when repeatedly faced with evidence that something is wrong, normalized the nonconformity so that it became acceptable to them. Some managers and controlling functions, when faced with fraud or execution related losses, decided not to act even though they had advanced warning and clear indications that something was wrong.

In an environment characterized by a large risk appetite[10], it is conceivable to imagine how investment banks would tolerate small deviations from the norm, but this can only be a highly risky proposition. A bank can become gradually tolerant of

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[9] *"The social organization of a mistake. The Challenger disaster was an accident, the result of a mistake. What is important to remember from this case is not that individuals in organizations make mistakes, but that mistakes themselves are socially organized and systematically produced. Contradicting the rational choice theory behind the hypothesis of managers as amoral calculators, the tragedy had systemic origins that transcended individuals, organization, time and geography. Its sources were neither extraordinary nor necessarily peculiar to NASA, as the amoral calculator hypothesis would lead us to believe. Instead, its origins were in routine and taken for granted aspects of organizational life that created a way of seeing that was simultaneously a way of not seeing. The normalization of deviant joint performance is the answer to both questions raised at the beginning of this book: why did NASA continue to launch shuttles prior to 1986 with a design that was not performing as predicted? Why was Challenger launched over the objection of engineers?"* From: Vaughan, Diane. *"The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA."* University of Chicago Press, 1996, Chap. X, pp. 394.

[10] Per Financial Stability Board (Financial Stability Board, Principles for an Effective Risk Appetite Framework, November 13th, 2013), Risk Appetite: *"The aggregate level and types of risk a financial institution is willing to assume within its risk capacity to achieve its strategic objectives and business plan." http://www.fsb.org/2013/07/r_130717/*

increasingly large (and dangerous) deviations from the norm. Only a strong risk culture and a healthy sense of skepticism can effectively address this phenomenon.

Cases Selected

Some of the most relevant cases of "rogue traders" include, but are not limited to:

- Barings Bank, 1995, Nick Leeson lost £827 million, which caused the bank to become insolvent.
- Société Générale, 2008, Jerome Kerviel lost €4.9 billion.
- UBS, 2011, Kweku Adoboli lost $2.3 billion.

A group of the top seven operational rogue trading events in history has been selected. These are listed in Table 2.

Table 2: Top seven operational losses selected for further analysis

Company Name	Loss Amount	Start Occurrence	End Occurrence	Location
Société Générale Group	$ 7,162,340,360	1/1/2005	1/18/2008	France
JPMorgan Chase	$ 6,200,000,000	1/26/2012	4/27/2012	United Kingdom
Sumitomo Corp.	$ 2,856,999,936	1/1/1985	6/13/1996	United Kingdom
UBS AG	$ 2,347,612,664	10/1/2008	9/14/2011	United Kingdom
Showa Shell Sekiyu KK	$ 1,476,906,536	1/1/1989	12/31/1993	Japan
Daiwa Bank	$ 1,440,060,032	1/1/1983	7/17/1995	United States
Barings plc	$ 1,300,000,000	2/1/1995	2/27/1995	Singapore

Lessons Learned

1. *Right tone from the top.* This is an indicator of a sound risk culture, where management leads by example, ensuring there is a common understanding and awareness of risk. It is important for organizations to learn from own (and peer) organization risk culture failures.
2. *Clear understanding of the products traded.* It should be clear at all times the type of products traded or originated by the organization, as this will dictate asset

and liability management, control testing, price verification routines and trading limits.

3. *Strong 1st and 2nd Line of Defense[11] controls and reviews.* Risk and control testing arms the organization with the ability to mitigate control gaps faster, constant and clear communication between lines of defense can only strengthen the control environment and, ultimately, drive results.
4. *More scrutiny, not less for successful traders.* Accountability is required, rooted in ownership of risk, clear and effective escalation of concerns processes and enforcement of policies and procedures.
5. *Incentive structure must not encourage excessive risk taking.* Remuneration and performance have been the subject of many recommendations by congressional mandate, regulatory agencies and many professional associations. It seems these efforts may attempt to look for a perfect incentive plan, a good first step is to identify and monitor material risk takers[12] within the organization.
6. *Vacations are good and necessary.* Most banking organizations have enforced the Two-Week Block Vacation policy with the objective of reducing possibility of fraud (& rogue trading) which will allow peer traders to review trades and valuations.

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[11] Per The Institute of Internal Auditors, *"the Three Lines of Defense model distinguishes among three groups (or lines) involved in effective risk management: functional that own and manage risks (first line), functions that oversee the risks (second line) and, functions that provide independent assurance (third line)."* The First Line includes the trading desks and business facing activities, the Second Line includes Compliance and Risk, while the Third Line includes Internal Audit.
https://na.theiia.org/Pages/IIAHome.aspx.

[12] Beal, Rick, Weisgerber, Alex, Poster, Claudia, Becker, Esther. *"Incentive Compensation/Risk Management – Integrating Incentive Alignment and Risk Mitigation."* Towers Watson, Canadian Institute of Actuaries, Casualty Actuarial Society, Society of Actuaries, 2013. "The Federal Reserve definition of material risk takers includes employees (or groups) anywhere in the organization that, through decisions or influence, can expose the organization to material risk."
https://www.casact.org/community/sections/rms/2013-Essays/Towers-Watson-essay.pdf

7. *Position valuations and strategies should be challenged by Risk Managers.* A key element for resilience is preparation to unexpected events, this can be achieved through a culture open to dissent which, at the same time, will support the stature of risk management and ensure it has an active role in the decision process of the organization.
8. *Distinct reporting lines for Compliance, Operations (back and middle office) and Risk Management.* Clear roles and responsibilities are in order, however, integration of these functions via risk management governance, regulatory affairs and issue management process will result in a comprehensive view of risks and systemic issues, while facilitating a better allocation of risk remediation.
9. *Back office controls must be strong.* Controls in this area can be significantly enhanced by the introduction of technology, clear communication with other areas is necessary, in addition to ability to raise issues to management on a timely basis.
10. *An effective and resilient risk management framework is required.* The organization's practices need to evolve with the times, through the adoption of new techniques and technologies; the true value of risk management will be mostly observed in times of volatility and stress.

CHAPTER 2: CASES

Société Générale Group

Background

Jérôme Kerviel joined SocGen in August 2000. His ambition was to trade SocGen's more exotic derivatives, but Kerviel did not have the required credentials.[13] For five years, he worked in the middle and back offices, including areas that were responsible for trade support. The middle office is where profits and losses are calculated, errors are reconciled and investigated, and trading risks are managed. Over time, he gained a sophisticated understanding of SocGen's systems, procedures, and controls, becoming deeply familiar with the proprietary system the bank used to book trades, known as Eliot. In 2005, Kerviel moved to the front office as a trading assistant, where his job consisted mainly of entering a trader's deals into the system, and later on he was a junior trader on the Delta One desk. In this new role, he created software management tools, did studies to extend the product range, and was assigned to arbitrage discrepancies between equity derivatives and cash equity prices.[14] He eventually accounted for half the desk's profits himself. However,

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[13] Carvajal, Doreen, Brothers, Caroline. *"French Trader is Remembered as Mr. Average."* New York Times, January 26, 2008.
[14] Osborne, Alistair. *"Jerome Kerviel's CV: The Ambitious Judo Teacher."* Telegraph.co.uk, January 27, 2008.

some of his peers later described him as an average guy, with *"mediocre abilities and limited experience."*[15]

Kerviel's unauthorized speculation began shortly after he joined Delta One. Delta One desks trade delta one, i.e. linear, or non-option, equity products. The heart of this is usually equity return swaps. Options have deltas ranging from (0, 1) for calls and (-1, 0) for puts. This gives them *non-linearity*, i.e. a call becomes more valuable faster the higher the stock goes (and vice versa for a put). Kerviel's manager noticed some irregularities, small but unauthorized long and short positions on index futures and stocks; as a consequence, some discussions ensued between Kerviel and his manager. In July 2005, Kerviel was again verbally reprimanded when his manager discovered a €10 million unhedged long bet on Allianz stock. However, the manager failed to notice that Kerviel had entered a fake trade for the same amount into the front office system. This fake trade served two purposes: a practical way to conceal his trades and a vehicle to conceal the earnings generated until he was in a position to declare them. It was not long until Kerviel's experiment became a constant. In the next three years, Kerviel tried on 947 instances to eliminate any hints or traces of the market risk that his unhedged trades generated.

Kerviel escalated his unauthorized positions in options, futures and forwards in addition to equities, reaching a total of $200 million in August 2006. While the risk-control department did monitor the bank's overall positions very closely, it did not verify the data Kerviel entered into Eliot; normally, the overall amount of risk would be detected by SocGen's risk management system, but Kerviel created fictitious transactions that balanced

[15] Sage, Adam. *"He's not a Machiavellian genius. He's just an average kind of guy."* The Times, January 26, 2008.

the risk monitored by the system. In essence, he made it look as if he was hedging his bets. Kerviel entered his fictitious trades into the system under titles that indicated the counterparty of the trade had not been properly captured, or that parameters such as the specific date of the trade had not been determined. In doing so, he delayed settlement of these trades. Finally, Kerviel cancelled his fictitious trades before they were verified by the middle or back offices and replaced them with new ones.

The method relied on perfect timing, so Kerviel rarely left his desk or took any vacations. In the summer of 2006, while the majority of the Delta One desk was on vacation, Kerviel was in Paris, making unauthorized long and short bets that added up to €140 million, which he later unwound. His reluctance to take vacations on four occasions in 2006-2007 was formally noted by two different desk managers. This could be interpreted as Kerviel's concern that an audit would uncover his rogue activities, but the information on Kerviel's reluctance to take vacations did not trigger any actions from his superiors.

Another one of his concealment techniques, used at least 115 times, was to enter pairs of fictitious reserve transactions -a purchase and a sale- for the same asset at different prices, allowing him to show a virtual loss that "cancelled" the earnings from his real trade.

The only person who paid close attention to Kerviel, his desk manager, left SocGen in early 2007. At that time, Kerviel had already accumulated a short position in DAX futures totaling $1.2 billion. This increased to $3.6 billion in February, $7.8 billion in March, and $42 billion in July. In April 2007, the financial markets started to experience volatility as a result of the subprime-mortgage market in the US, measured via the CBOE Volatility Index, or VIX (Figure 2). He unwound the position in August and then built up

a new and even larger portfolio of DAX and EUROSTOXX futures in September, reaching $45 billion. He also had a portfolio of unauthorized directional equities positions.

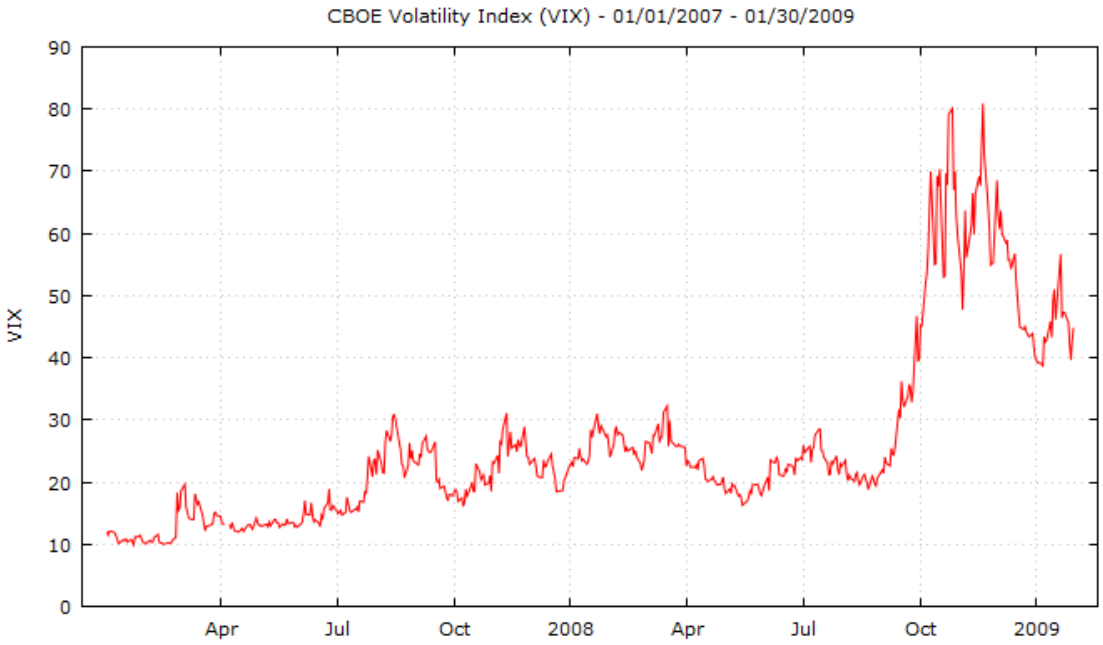

Figure 2: CBOE Volatility Index (VIX)

In the month of November, the Trading Surveillance Office at Eurex, the derivatives exchange run by German exchange group Deutsche Börse, sent an email to SocGen to find out why Kerviel was sending a massive volume of trades through the German futures exchange. This was not the first instance, as "several transactions" had raised red flags. SocGen responded to the exchange on November 20, when a risk controls expert at the bank replied there was nothing irregular; in particular, the reply stated, *"The recent volatility increase on the U.S. and European stock markets explains our new need for after-hours trading."*[16] On November 26, Eurex sent a second email demanding a better explanation, as the exchange was not satisfied by the bank's original explanation. Per a bank officer, *"Their questions were based purely on strategy and procedure. At no*

[16] Schwartz, Nelson D., Bennhold, Katrin. *"A Trader's Secrets, a Bank's Missteps."* New York Times, Feb. 5, 2008.

moment of these conversations was there any mention of abnormal volumes. They considered our second written response adequate and satisfying."[17] SocGen provided additional details on December 10 and offered a conference call to further discuss the matter, but Eurex let the matter drop.[18]

At the end of 2007, Kerviel misreported earnings on his trades of €43 million to his managers by unwinding all of his unauthorized trades, a small portion of the €2.2 billion profits he had fraudulently generated from his unauthorized trades.

Between early and mid-January 2008, Kerviel built up a long position on index futures of €49 billion ($72 billion), an amount that far exceeded SocGen's market capitalization, and was not hedged. The end of 2007 had been awful for the French Stock Exchange in general (Figure 3), and in particular for SocGen (Figure 4). Rumors that had started to circulate on the size of the exposure of the Eurozone's fifth largest bank to the subprime credit crisis in the United States had driven down SocGen's market capitalization by almost 25% since the summer. On January 15, fears spread that major US financial institutions were more exposed to defaulting mortgages than they had previously admitted, setting off a global slump in stock markets. That same day, a review performed by the Direction Financière on the trading operations of SocGen was underway. The purpose of the review was to certify that the trades conducted by SocGen's Global Equity and Derivatives Solutions unit met the Basel Accords regulatory requirements for the amount of capital reserves a bank must keep on hand relative to its risk-adjusted assets in case of an unexpected loss. Some bank analysts covering SocGen

[17] Ibid.
[18] Société Générale. *"Mission Green: Summary Report."* General Inspection Services, May 20, 2008, pp. 8.

believed that equity derivatives might account for up to 80% of all SocGen's investment banking revenues, worth several billion euros each year.[19] That would involve a lot of trading, which would impact the capital-to-assets ratio, as it fell to very low levels.

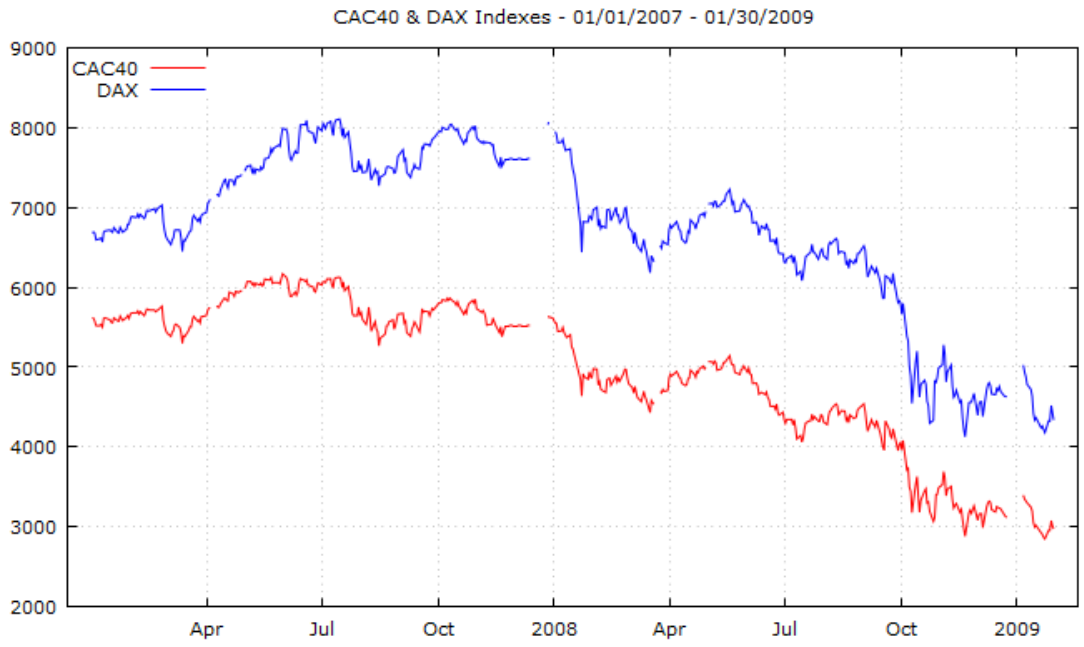

Figure 3: CAC40 & DAX Indexes

A bank controller identified as "Agent 6," working in the Direction Financière, noticed a problem in January 2008 with the capital-to-assets ratio for eight trades originated in the Delta One trading desk. The trading desk's main product was "turbo warrants," which are a form of "barrier" options. These options become active or inactive once a price barrier is reached, and the barrier can be below or above the spot price of the option.

[19] Société Générale annual reports, 2004, 2005 and 2006.

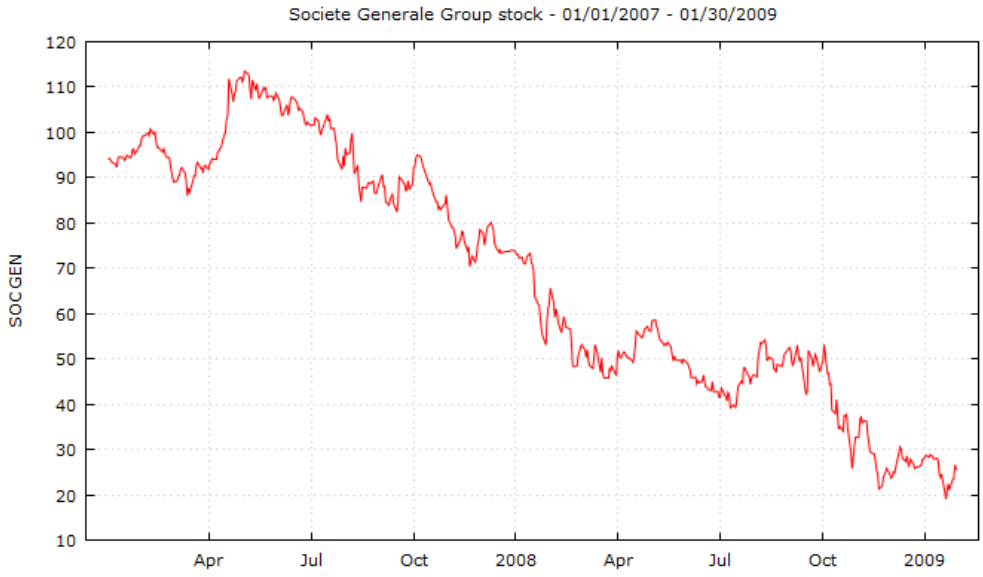

FIGURE 4: Société Générale Group stock

The main purpose is to provide the insurance protection of an option while paying less of a premium, because what one is acquiring is the barrier and not the ordinary option to buy or sell at a specific price. Delta One's use of turbo warrants was in itself a form of arbitrage. As markets are somewhat inefficient, with similar or identical securities priced differently on different exchanges, the role of arbitraging is to move securities from one market to another, and a good trader can easily obtain risk-free profits. Profits tend to be small, unless the volumes exchanged are significant. In the case of SocGen's Delta One desk, traders typically placed positions of about €1 million, and their combined risk (including hedges) could not exceed €125 million.[20] The sums that caught the controller's eye were "massive" – about €1.5 billion.[21] What concerned the controller the most was that there were no apparent counterparties to the trades, which meant that the bet could be fully unhedged – the exposure might be total to SocGen. The

[20] Op. cit., Mission Green, p.29.
[21] Ibid, pp. 31-34.

controller contacted several of her colleagues for an explanation. Agent 6 was shown e-mails from Kerviel confirming the trades had been cancelled a week ago, but no evidence could be found confirming the cancellation. Agent 6 continued to investigate and forwarded the queries to her superiors. On January 18, Kerviel explained the source of the confusion as the incorrect counterparty being listed in the computer and provided the name of a trader at another financial institution. On that same day, SocGen lost about 8% of its market capitalization as the subprime crisis continued to worsen, and the Governor of the Bank of France announced that SocGen and another peer institution needed to lower the valuation of their assets in the US. The next morning, it was confirmed that the trader Kerviel provided as the "counterparty" knew nothing about the specific trades. Kerviel was recalled from a weekend trip to Normandy. Additional reviews confirmed Kerviel had been conducting unauthorized trading for months and had even made a profit for SocGen of €1.4 billion by the end of 2007.

Between January 21 and 23, 2008, SocGen unwound Kerviel's positions -€49 billion ($72 billion)- before issuing a public statement on January 24 detailing the fraud. This amount was equivalent to 181% of the SocGen group's total capital of €27 billion.[22] The bank planned to announce €2 billion in subprime losses but decided to delay the announcement until after the trades were unwound and it could announce both events together. Global markets were sharply down (Figures 3 and 5). The US markets were closed for the Martin Luther King holiday. On January 22, 2008, the US Federal Reserve announced a sharp interest rate cut - the largest cut since the early 1980s. The US market opened sharply down, but recovered somewhat by the end of the day. SocGen reported the

[22] Source: Document de reference 2008, p.19.

loss as part of its fourth quarter 2007 financial results. On January 24, 2008, SocGen announced that it had lost $6.7 billion due to *"exceptional fraudulent trading activities."* After the announcement, the stock plummeted, knocking $18 billion off the company's market capitalization (Figure 4). The drop may have been magnified by the fact that SocGen dumped Kerviel's stakes, which accounted for between 5.7% and 8.1% of the total volume in futures indexes on the EUROSTOXX and DAX exchanges[23] (Figure 3).

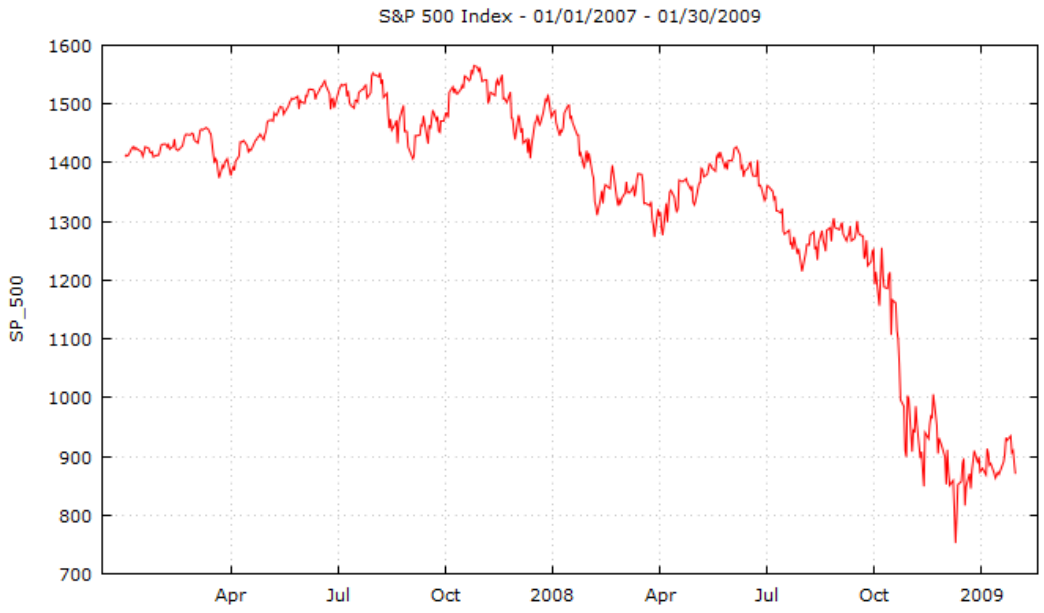

FIGURE 5: S&P 500 Index

Taking into account Kerviel's trading profits of $1.7 billion in 2007 and trading losses of $8.9 billion in 2008, the net result of Kerviel's unauthorized trading was a monumental loss of $7.2 billion. This amount exceeded the combined rogue trading losses incurred by Yasuo Hamanaka ($2.6 billion), Nick Leeson ($1.3 billion), Toshihide Iguchi ($1.1 billion), John Rusnak ($691 million), and Dany Dattel ($480 million). To back-stop the losses, JP Morgan and Morgan Stanley agreed to provide €5.5 billion in new capital.

[23] Lagarde, Christine. *"Rapport au Premier minister concernant les ensignements à tirer des éventements récemment intervenus à la Société Générale."* Ministère de l'économie, des finances et de l'emploi (Ministry of Finance), February 2008, pp. 4.

The trader did not appear to have profited from the fraudulent trades, and his motivations were unclear. According to one of his superiors, Kerviel did not profit personally, *"he made no money, nothing, not a cent… It's difficult to get money out of a bank, as soon as you try, you will leave a trace. So he saw no financial benefit at all."*[24]

Interestingly, it has been reported that such trading raised supervisory/risk management suspicions in the past, but that the trader successfully addressed any questions/suspicions.[25] Kerviel was able to remain undetected by the bank's risk management IT systems and disguise the market risk that his unhedged trades created by drawing on the knowledge he had acquired about SocGen's internal computer systems during his previous employment with the bank. As disclosed by The Economist, Kerviel was aware of the bank's focus on its traders' net exposure, the difference between the portfolios that are being arbitraged. As a consequence, Kerviel was able to keep his net exposure within the bank's set range, and he avoided detection by creating fictitious trades to balance the unauthorized trades he was making. Kerviel's fictitious trades would be entered in such a way as to suggest that the counterparty was not classified and that the dates of the trade had yet to be determined, delaying the settlement of these transactions. Kerviel would then cancel the transactions before they were verified by back and middle-office staff and enter new ones. Before the scheme was discovered, Kerviel was contacted on numerous occasions regarding his trading activities. Red flags were raised by several controllers at SocGen, but none of them decided to escalate the matter and conduct an investigation into Kerviel's activities.

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[24] Chrisafis, Angelique. *"You must stop this manhunt!"* The Guardian, January 24th, 2008.
[25] *Rousselot, Fabrice. "Société Générale." Libération. January 25, 2008.*

In May 2008, SocGen undertook a comprehensive analysis of the breakdowns of controls that allowed Kerviel to trade without authorization. They learned that Kerviel was flagged 74 times by the bank's systems and controls, and that 64 of the 74 alerts were linked to unauthorized activities. They learned that Kerviel used three main techniques to conceal his activities:

1. *Taking an Unauthorized Position*: He would enter fictitious transactions to conceal the actual position and the market risk incurred. He would later cancel the fictitious transactions before confirmations, settlements, or controls were generated, and then replace them with a cascade of new fictitious transactions whose settlement dates were far into the future. Kerviel entered 947 transactions of this type.
2. *Unwinding an Unauthorized Position*: He entered fictitious pairs of purchases and sales at off-market prices that offset his earnings. The pairs were made in identical quantities, so they would not create a new position on the system. Kerviel entered 115 transactions of this type.
3. *Unrealized Earnings*: These were calculated on a monthly basis. To offset unrealized earnings, he posted intra-month positive or negative provision flows. Kerviel entered nine transactions of this type.

On July 4, 2008, the Banking Commission of France fined SocGen €4 million for failings that had been revealed by this trading loss. According to Reuters, these failings included, but were not limited to, poor supervision, serious breaches in the bank's internal controls, and severe weaknesses in the security of IT systems. Kerviel is believed to have

stolen IT access codes and user credentials belonging to middle- and back-office colleagues to cancel out certain trading operations.[26]

Contributory/Control Factors

SocGen did a comprehensive analysis of the deficiencies in its control environment that enabled Kerviel's unauthorized activities. The company also hired PricewaterhouseCoopers to do an independent analysis. Some of the major findings from this engagement included a significant fragmentation of controls between several units, compounded by a lack of aggregated reporting; inadequate resources allocated to control functions in general and inadequate resources allocated specifically towards fraud prevention and detection; insufficient response to corrective actions identified by Audit[27]; a lack of seniority in the back and middle office staffs that ultimately diminished their effectiveness; systems that did not process transactions effectively; and the inability of back office staff to adhere to some controls that were in place, due to a reliance on manual processing. SocGen missed 75 alerts between June 2006 and January 2007 on Kerviel's activities. Risk control procedures were followed correctly, but compliance officers rarely went beyond routine checks and did not inform managers of anomalies, even when large sums were involved. The independent investigative panel supported Kerviel's claim that he acted alone and that he did not profit personally from the trades.

Despite a number of warning signs that should have drawn scrutiny, Mr. Kerviel conducted his scheme for two years without detection. For instance, the large brokerage

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[26] Kotz, David H., Conversano, James. *"JPMorgan's London Whale and "Rogue Traders": How financial services companies can protect themselves."* Financial Fraud Law Report, November/December 2013, pp. 885

[27] Emphasis should be made on improving the execution of the controls. Majority of organizations have implemented controls over unauthorized trading.

commissions arising from his trading positions should have garnered attention from compliance staff, but failed to do so.[28] SocGen did have a significant number of risk policies and controls in place, but it seems that a weak control environment and a flawed governance culture allowed the fraud.[29] The investigation found that Kerviel started building up unauthorized trading positions in 2005 and 2006 for small amounts, but the positions he took grew in size from March 2007 onward. Kerviel's 2007 gains were reportedly more than a quarter of the profits of the eight traders on the same trading desk that year. This sudden, unexplained, six-fold jump in profits between 2006 and 2007 should have led to serious questions, but failed to raise suspicions on the part of management.[30] According to Kerviel, by Christmas he was in profit by €1.4 billion but his activities were discovered on January 8 and fully identified by January 18, and SocGen was forced to secretly unwind the positions between January 21 and 23 in falling markets, taking it to a €4.9 billion loss. Several elements converged not only to uncover the actions of Kerviel but also to magnify the effects on SocGen's stock and stock indexes once the announcement of the fraud was made.

The red flags that should have alerted management to the rogue trades included a trade with a maturity date that fell on a Saturday, bets without identified counterparties, trades with counterparties within SocGen itself, trades that exceeded the limits of counterparties, missing broker names, and large increases in broker fees. There were also differences of up to €1.1 billion during reconciliations of Kerviel's trading books with

[28] Rogue trading cannot be completely prevented. Its risk can be managed in an acceptable way, but it becomes very difficult to implement without preventive controls like real time monitoring.
[29] Kotz, et al., 2013.
[30] Performance far above goals is a risk indicator. Positive or negative performance outliers should be investigated.

SocGen's online derivatives broker. The independent investigative panel found seven false emails sent by Kerviel that attempted to explain his trading and counterparties.

Some additional details from public sources

The 144-year-old bank allowed a culture of risk to flourish, creating major flaws in its operations that enabled the rogue trader's activities to go undetected, according to bank officials, investigators and traders who worked with Kerviel.

Far from being discouraged from placing big bets, SocGen traders were rewarded for making risky investments with the bank's money. It was not uncommon for traders to briefly exceed limits imposed on their trading before pulling back, despite controls meant to prohibit this. The damage of this event was magnified by two clear trends, the explosive growth of the bank's derivatives business and its use of its own money to make bets on the market, also known as proprietary trading. According to an employee of the bank, *"You must take positions, even if you are not a proprietary trader. During appraisals by bosses, they made it clear you were judged by how well you did your basic job, as well as how much money you made on prop trades."*[31] Kerviel told the French prosecutors, when asked if his superiors knew of these activities, that, *"at the beginning, just as at the end of my maneuvers, they didn't want to intervene. They knew the machinery."*[32] An analyst with ABN Amro in London, Kinner Lakhani, said: *"Unlike some of their peers, SocGen was not shy about taking proprietary trading risks. Perhaps such business grew faster than risk management could cope."*[33] According to the same source, within SocGen's corporate and investment bank, the percentage of revenue from market-making and proprietary

[31] Schwartz, et al., 2008.
[32] Schwartz, et al., 2008.
[33] Schwartz, et al., 2008.

trading rose to about 35 percent by mid-2007 from 29 percent in 2004. Kerviel generated nearly 27% of the total earnings of Delta One. That made him the 15th among the 143 traders working on the 10 desks of the Arbitrage unit of the Global Equity and Derivatives Solutions division of SocGen Corporate & Investment Banking group.[34]

The investigation produced several other findings. First, large speculative positions were concealed by equal and opposite fictitious trades, thus concealing the mark-to-market effect and market risk exposure. Second, unauthorized trades were possibly booked across a large number of either dormant or "dummy" accounts which were not necessarily monitored on a regular basis, as exchanges impose daily margining on all participants. This raises significant questions about SocGen's margin process, the trader possibly entered into transactions with multiple large counterparties, thus staying within limits and possibly benefiting from cross-product netting for margin. Third, massive open positions would have been rolled forward to avoid settlements. The trader may have used cancels and/or amendments on the fictitious trades to maintain the real trades within limits. Fourth, in anticipation of periodic reviews by Risk Control, the trader may have used book-entry transfers to move the massive real positions between accounts, Fifth, the trader most likely had access to both front and back systems through potential ID/password theft and/or sharing or continued access from his previous role in Risk Control that should have been terminated. Such access could have enabled manipulation of credit, market risk and trade-size controls. Sixth, the trader most likely did not take any vacation during this period and frequently worked late into the night or on weekends. Finally, regulators did not share

[34] Mission Green, pp.47, 14.

information about the alerts raised on this case. All these elements further weakened the control environment which allowed Kerviel to disguise and operate at will.

SocGen's chief executive, Daniel Bouton, has admitted his bank's internal systems did not keep up with the pace of growth in the derivatives business. An analyst who covers SocGen but insisted in anonymity said: *"He told them while our derivatives business was going 130 miles an hour, risk control was only going 80."*[35] The same analyst also added that with traders making so much money, *"they were untouchable; they had the power."*[36] Pascal Decque, an analyst who covers SocGen in Paris for Natxis, agreed that the bank was more willing to take risks than any of its French rivals, as an example, he cited SocGen's loss of €2 billion stemming from subprime-related investments — twice the size of the hit BNP Paribas took, even though BNP is larger. These losses were hardly insignificant, yet far lower than the subprime damage inflicted through the beginning of February 2008 on Citigroup ($18 billion), UBS ($13.5 billion), Morgan Stanley ($9.4 billion), Merrill Lynch ($8 billion), HSBC ($3.4 billion), Deustche Bank ($3.2 billion) and Bear Stearns ($3.2 billion). In a matter of weeks Bear Stearns would collapse under the weight of its losses and be taken over by JP Morgan Chase at a fire sale price.[37] Last, but not least, it remains possible, despite SocGen's management's declaration otherwise, that collusion with either external or internal parties were involved. At a minimum, friendships established during years in risk management were maintained and used to obtain information. All these elements support the hypothesis that SocGen had a culture that encouraged high risk.[38]

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[35] Schwartz, et al., 2008.
[36] Schwartz, et al., 2008.
[37] Anon. *"Subprime Pain: Who Lost How Much?"* Rediff News, February 6, 2008.
[38] 33

JPMorgan Chase

Background

In late 2011 and early 2012, with the health of the corporate credit market was improving, Bruno Iksil[39] and a small group of derivatives traders in the London office of JPMorgan (JPM) were given a set of conflicting priorities by the institution's senior leadership.[40] The traders were told to rapidly reduce the risk in their derivatives portfolio while, at the same time, minimizing the trading costs of doing so.

JPM emerged from the financial crisis of 2007-2009 in better financial condition than many of its competitors. JPM grew to become the largest bank holding company in the United States (US), with assets of $2.3 billion at December 31, 2011. JPM was able to successfully acquire two financial institutions during the financial crisis: Bear Steans and Washington Mutual. JPM had a better liquidity position (higher balance of customer deposits). The amount of money loaned by JPM was regularly less than the amount of deposits held by the bank on behalf of depositors; for example, JPM reported $1.128 trillion of deposits as of December 31, 2011, and $724 billion in loan balances. As a result, JPM needed to profitably and safely invest. This became the primary task of the bank's Chief Investment Office (CIO). The CIO unit was spun off from the bank's Treasury department

[39] The names of certain UK-based individuals have been excluded from the Report of JPMorgan Chase & Co. Management Task Force regarding 2012 CIO Losses in order to comply with United Kingdom data privacy laws. JPM Task Force 2013. Report of JPMorgan Chase & Co. Management Task Force Regarding 2012 CIO Losses. January 16th, 2013. http://files.shareholder.com/downloads/ONE/2272984969x0x628656/4cb574a0-0bf5-4728-9582-625e4519b5ab/Task_Force_Report.pdf.

[40] Zeissler, Arwin G., Ikeda, Daisuke, Metrick, Andrew. *"JPMorgan Chase London Whale A: Risky Business."* Yale Program on Financial Stability Case Study 2014-2A-V1, December 2014.

in 2005 as an independent group within JPM. Ina Drew, who served as JPM's Chief Investment Officer, was appointed to lead the CIO. The CIO invested the bank's excess deposits in investment grade assets, like Treasury bonds and other fixed income securities, including corporate, municipal, and asset-backed bonds. This approach was much in line with how other banks managed excess deposits, and the average credit rating of the CIO's investments was AA+. By late 2011, the CIO was managing a $350 billion portfolio of mostly high credit quality, fixed income securities, such as whole loans, asset-backed securities, mortgage-backed securities, municipal bonds, corporate securities, sovereign securities, and collateralized loan obligations.[41]

The CIO had various additional mandates, including funding JPM's retirement plans, as well as hedging risks associated with interest rates and mortgage servicing rights on behalf of other units within the bank. A key secondary function of the CIO was to offset the risk that somebody who borrowed from JPM might not repay the loans. This default risk was to be mitigated by a specific group within the CIO, the Synthetic Credit Portfolio (SCP). Achilles Macris, the International Chief Investment Officer and Drew's subordinate, submitted a request to begin trading credit derivatives which would allow the group to "*effectively manage residual exposure created by [JPM's] operating businesses.*"[42] The CIO approved this proposal in May 2006. The document approving this request indicated that the proposal did not need to be approved by the CIO's primary regulator, the Office of the Comptroller of the Currency (OCC).

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[41] United States Senate Permanent Subcommittee on Investigations. *JPMorgan Chase Whale Trades: A Case History of Derivatives Risks and Abuses (Exhibits)*. March 15, 2013, pp. 15-50. (US Senate Exhibits) *https://www.hsgac.senate.gov/subcommittees/investigations/hearings/chase-whale-trades-a-case-history-of-derivatives-risks-and-abuses.*

[42] US Senate Exhibits, 36-37.

Three CIO employees were responsible for the SCP on a daily basis. This group was run by Javier Martin-Artajo, the head of credit and equity trading, who reported to Macris and directly oversaw the SCP. Bruno Iksil, who would come to be known as the "London Whale," reported to Martin-Artajo and was the head SCP trader. Julien Grout was a junior trader and reported to Iksil. JPM's acquisition of Bear Stearns and Washington Mutual Bank in 2008 during the financial crisis brought in more funds to the CIO, so the SCP also grew. The strategy was simple: buy more default protection as markets became worried about the prospects of the economy, and buy less as those worries dissipated. The SCP generated more than $1 billion in revenue in 2009, largely from having purchased protection against a bankruptcy filing by General Motors. The SCP consisted mostly of long and short positions in various credit default swaps (CDS) and other credit derivatives. The trading book of SCP was -on balance- a net purchaser of credit protection, since it was supposed to help hedge the credit risk facing the bank, but it ultimately proved to be the source of a $6 billion loss.

Conflicting Objectives

A series of events occurred between late 2011 and early 2012 that indicate the conflicting objectives faced by the CIO traders and illustrate the circumstances that led to the disastrous expansion of the SCP trading book in the first quarter of 2012.

In the beginning of the summer of 2011 (and continuing through the fall), Iksil acquired credit protection on a specific tranche of the CDX North American High Yield (CDX.NA.HY) index that had been created by Markit. Iksil's position had the possibility to profit enormously, only if two or more of the 100 high yield companies in the index defaulted or declared bankruptcy before the expiration of the contract on December 20,

2011. JPM received a payout due to the bankruptcy filing by Dynegy on November 7 and American Airlines on November 29. Iksil continued to bet over and over on the same strategy, which could have resulted in a large loss. Rival derivatives traders at other firms started to refer to him in as a "caveman".[43]

The trade resulted in a profit, but it should have attracted attention within the CIO and JPM. If American Airlines had filed for bankruptcy three weeks after (December 20), the significant profit would have been replaced by a massive loss because the credit derivatives would have expired worthless. Without the profit from his trade, the SCP would have only broken even for 2011. Finally, JPM was not able to clarify how this trade acted as a hedge for the bank.[44]

In light of the conflicting goals, Iksil in late January 2012 suggested the expansion of a strategy first implemented in 2011 to buy credit protection on companies with higher yields (higher risk) and sell protection on investment grade companies (lower risk), the latter allowing the premium cost to be funded. The immediate result of the increase in trading activities caused the net notional size of the SCP portfolio to more than triple from $51 billion to $157 billion, from year 2011 to March 31, 2012.

As noted above, in December 2011, JPM senior leadership instructed the CIO to reduce the size of the SCP in the upcoming year as part of a bank-wide effort to prepare for the new Basel III capital requirements. As a federally chartered bank, JPM is required to maintain a minimum amount of capital. To determine the right quantity, US bank regulators follow the recommendation of the Basel Accords and require the calculation of

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[43] Zuckerman, Gregory. "*From 'Caveman' to Whale,"* Wall Street Journal. May 17, 2012.
[44] Ziessler, Arwin G., and Metrick, Andrew. "*JPM Morgan Chase London Whale G: Hedging versus Proprietary Trading."* Yale Program on Financial Case Study 2014-2G-V1, December 2014.

RWA, which is a dollar measure of a bank's total assets, adjusted according to the riskiness of the assets. The amount of capital that a bank must hold is then calculated as a percent of its RWA. Given that synthetic assets (such as credit derivatives) would require far more capital under the new regime, the main source of RWA reduction within the CIO was to come from the SCP.

The economic environment was improving, and credit markets were also expected to improve, in which case the CIO had less need to hedge its $250 billion portfolio of available-for-sale debt securities. As a consequence, the SCP book was moved to a more neutral risk position (neither long nor short credit risk).

The most direct way to quickly reduce the size of the SCP, as measured by RWA, was to "unwind" the positions in the book. Unwinding a position even in the most actively traded CDS is difficult because these positions are illiquid and incur large trading costs to buy or sell. As mentioned, an alternative was to unwind the positions owned by the SCP with a cost of about $500 million, but Chief Investment Officer Ina Drew was not willing to explore this option. The SCP was encouraged to repeat the gains as the one experienced due to the bankruptcy of American Airlines in November 2011 and avoid those like in the case of Eastman Kodak's bankruptcy in January 2012.[45] In order to repeat this accomplishment, additional purchases of default protection were needed, which again conflicted with the directive to reduce the size of the SCP trading book.

The Eastman Kodak bankruptcy filing on January 19, 2012, impacted the SCP book with a significant loss; as the CIO sold protection, it was required to make a large payment

[45] US Senate Exhibits, pp. 65. JPMorgan Chase Task Force interview of Bruno Iksil, CIO (partial readout to the Subcommittee on 8/27/2012); see also 2013 JPMorgan Chase Task Force Report, at 30.

when Kodak defaulted, causing a loss of $50 million. In sum, the traders had several conflicting objectives. The CIO traders were instructed to reduce RWA, while minimizing the cost of doing so, while avoiding losses similar to those experienced with the Eastman Kodak bankruptcy and maintaining the upside potential from defaults such as that of American Airlines.

An internal investigation on the losses conducted by JPMorgan Chase Management Task Force (JPM Task Force) confirms the following: *"By early 2012, CIO management, including Ms. Drew, had imposed multiple priorities on the Synthetic Credit Portfolio. The priorities included (1) balancing the risk in the Synthetic Credit Portfolio, (2) reducing RWA, (3) managing profits and losses, (4) managing or reducing VaR, and (5) providing "jump-to-default"*[46] *protection. These priorities were potentially in conflict, and the requirement that the traders satisfy all of these goals appears to have prompted at least some of the complicated trading strategies that led to the losses. Rather than imposing a multitude of potentially competing priorities on the traders, CIO management should have determined (or engaged senior Firm management on the question of) which of these priorities should take precedence, how they could be reconciled, and how CIO intended to execute on the priorities. That did not occur and instead, CIO management imposed inconsistent and potentially competing priorities on its traders.""*[47]

[46] CDS also pose "jump-to-default" risk, meaning the risk of a default that would yield a very significant financial payment obligation by CDS protection sellers. Furthermore, the risk presented by CDS is asymmetrically larger for protection sellers (short positions) than for protection buyers (long positions). Ivanov, Stan, Underwood, Lee. "*CDS Clearing at ICE: A Unique Methodology."* Futures Industry, November 2011.

[47] JPM Task Force 2013, pp. 85.

A Strategy is Proposed

Instead of quickly unwinding the SCP book by disposing of its positions, Iksil devised a complex trading strategy, which involved long and short positions on numerous credit derivatives. The primary objective involved buying credit protection on high yield bonds (higher risk) while, at the same time, selling credit protection on investment grade bonds (lower risk). On January 26, 2012, Iksil presented the proposed trading strategy at a meeting of the CIO International Senior Management Group explaining that he *"had been unable to trade out of the high-yield short positions and viewed the addition of a long-risk position in IG-9 as the 'next best hedge'."*[48] Drew later declared to the US Senate the presentation was unclear to her.

The Strategy is Implemented ("London Whale" Trades)

Upon completion of the CIO meeting, Iksil and the CIO traders increased both the long and short sides of the SCP book. The derivatives of choice were based on the CDX.NA.HY and CDX.NA.IG credit indices[49] and tranches[50] administered by Markit.

Iksil bought protection (long position) on the CDX.NA.HY, which tracks 100 North American companies that are classified as High Yield based on their credit ratings. At the same time, he simultaneously sold protection (short position) on the CDX.NA.IG, which

[48] JPM Task Force 2013, pp. 63.
[49] A credit index tracks a specific basket of credit instruments, while a credit tranche tracks a specific portion of a credit index.
[50] CDS index tranches are financial instruments based on CDS index, where each tranche references a different segment of the loss distribution of the underlying CDS index. Tranches have been issued on several indices. The lowest tranche, known as the equity tranche, absorbs the first losses on the index due to defaults up to a maximum of 3% of the total index. The next tranche (mezzanine) absorbs losses of 3-7%. Further losses are absorbed by higher-ranking tranches (senior and super-senior tranches). In return for being more likely to suffer losses, the equity tranche yields the highest coupon (or stream of payments); conversely, the super-senior tranche yields the smallest coupon. JPM Task Force 2013, pp. 23.

tracks 125 North American companies that are classified as Investment Grade. In addition, Iksil took positions on similar credit indices in Europe.

Markit[51] creates two new series of each index every year, as new bonds are issued and existing bonds mature or default. When selling credit protection, Iksil primarily used the CDX.NA.IG9 series of the index. IG9 was created in 2007 before the worst of the financial crisis, and it included five companies rated as investment grade in 2007 but downgraded to high-yield status later, thus providing a closer offset to the CDX.NA.HY high-yield credit protection held in the SCP book.

Iksil started to almost immediately change his stance about the proposed trading strategy, and in January sent a series of communications to his superior Martin-Artajo stating that *"the current strategy doesn't seem to work out"* and that notional amounts under the new trading strategy had already *"become scary"*, so that the "only" course of action was *"to stay as we are and let the book simply die."*[52]

On February 13, Ally Financial announced that its ResCap mortgage subsidiary was planning to file a pre-packaged bankruptcy later in 2012. At that time, it became evident that something was not developing as expected, as SCP's high-yield short risk and investment grade long risk positions were not offsetting each other as expected. The rally continued in the credit market, and the market value of the SCP continued to fall. As a consequence, SCP's investment-grade long risk positions gained less value than expected, while the high-yield short risk positions lost more money than the traders expected.

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[51] Markit Ltd. is a global financial information and services company founded in 2003 as an independent source of credit derivative pricing. The company provides independent data, trade processing of derivatives, foreign exchange and loans, customized technology platforms, and managed services.
[52] US Senate Exhibits, pp. 77-78.

In March, the credit market remained "unusually bullish" and the SCP book continued to *"underperform"* according to Macris.[53] Given that the gains experienced on investment grade positions (sell protection, long risk) were less than losses on high yield positions (buy protection, short risk), the SCP continued to lose money in the aggregate. The traders continued to sell even more protection in an effort to stop the losses, with the aim to "defend" their existing positions and to balance their long and short risk exposures.

On February 29, Iksil sold protection on over $7 billion notional exposure to the CDX.NA.IG9 index with 10-year maturity; this amount represented more than 90% of the dollar value of all trades of that product on that day by the entire market and approximately triple the average daily volume traded by all participants. As such, this volume of sales by the CIO was large enough to single-handedly push down the market price of default protection on CDX.NA.IG9 compared to what it would otherwise have been, helping to "limit the damage" of adverse month-end price moves.[54]

SCP lost $69 million in February, and the notional size of just the IG9 position increased from $75 billion to $94 billion. On February 29, in a meeting with senior bank officials including Dimon and John Hogan (Chief Risk Officer), CIO management confirmed that the plan to reduce RWA was under way, but not that the plan involved increasing the size of the SCP portfolio.

Iksil became suspicious that the amount of protection sold on the IG9 index signaled traders at other firms that JPM was behind the significant activity and that these

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[53] US Senate Report, pp. 81.

[54] Commodity Futures Trading Commission (CFTC). *JPMorgan settlement agreement.* October 16, 2013., pp. 8. http://www.cftc.gov/idc/groups/public/@lrenforcementactions/documents/legalpleading/enfjpmorganorder101613.pdf

traders were taking advantage of this fact. Most credit derivatives trading takes place among a small number of market participants, mostly banks and hedge funds, but contrary to what economists like to refer as “perfectly competitive” with many market participants buying and selling, none of which is large enough to affect the price. Within this small community, traders are familiar with one another and may exchange rumors or points of view about specific market activity, like who bought or sold which derivatives.

For perspective, the CIO's aggregate position in IG9 equaled 10-15 times the average daily trading volume of the index, making the position difficult to keep anonymous and even more difficult to liquidate in case of a market disruption.[55] As a result, Iksil and the CIO traders readily switched from the IG9 index to newer IG indices with higher trading volume to reduce signaling their positions and activities to other market participants.

On March 21, Drew met with Macris and Martin-Artajo to discuss in detail the continued underperformance of the SCP book and additional measures to reduce RWA. On March 22, the CIO traders sold protection on more than $10 billion notional exposure, causing SCP to breach a particular risk limit known as the CSWl0% limit. This metric measures the expected profit or loss to a portfolio if the spread on each credit position simultaneously widened by 10% of its current amount (e.g., from 2.00% to 2.20%).

[55] JPM Task Force 2013, pp. 64.

Simultaneously, during the first quarter of 2012, the SCP book caused the CIO to breach a number of other market risk limits[56] that JPM established to prevent large trading losses.[57]

Drew considered CSWl0% to be the most important limit, but questioned the value of the other metrics. Macris, Martin-Artajo, and Iksil were ordered by Drew on March 23 to "put phones down" and to stop trading the SCP book. At this point, SCP losses were $222 million (YTD).

On March 23, both the SCP and JPM were long credit, meaning that a worsening credit environment would hurt both the SCP and JPM and an improving credit environment would help both the SCP and JPM, in contrast to the SCP's stated purpose of offsetting some of JPM's risk.[58]

Consequences

On March 30, Macris communicated to the bank's Chief Risk Officer his doubts and even indicated that he had "lost confidence" in his team and asked for "help with the synthetic credit book"[59]. During the first quarter of 2012, the net notional value of the SCP book had more than tripled from $51 billion to $157 billion. As the size of the positions within the trading book increased, losses also mounted; Iksil mentioned on January 26 during the presentation the possibility of losses from the new trading strategy

[56] Per Financial Stability Board (Principles for an Effective Risk Appetite Framework, November 13th, 2013), Risk Limits: *"Quantitative measures based on forward-looking assumptions that allocate the financial institution's aggregate risk appetite statement (e.g. measure of loss or negative events) to business lines, legal entities as relevant, specific risk categories, concentration and, as appropriate, other levels."* http://www.fsb.org/2013/07/r_130717/.
[57] For more detail, refer to Risk Framework section.
[58] JPM Task Force 2013, pp. 45.
[59] JPM Task Force 2013, pp. 86.

totaling $500 million in a worst-case scenario, but SCP losses were $550 million for the month of March alone, or $719 million year-to-date.

On April 4, Peter Weiland, the head of market risk at the CIO, received a call from a Wall Street Journal reporter indicating that the newspaper was working on a story about Iksil and the CIO group. On April 5, Drew informed the JPM Operating Committee of the upcoming news. On April 6, both Bloomberg and the Wall Street Journal published the first accounts about Iksil's trading strategy. As feared by Iksil, the Bloomberg reporters compared notes from five counterparties at hedge funds and rival banks with whom Iksil traded. Given the frequency and the size of the trades, large enough to distort market prices in certain cases, some of these counterparties referred to Iksil as the "London Whale"[60].

Iksil's concerns were appropriate as it became clear that counterparties would trade against him if they became aware of the size and composition of JPM's derivative holdings. On April 10, the SCP recorded a single-day loss of $415 million, the first day of trading after the news story broke. This was the SCP's largest daily loss year to date (in 2012), and it was several times larger than the average daily loss of $11 million during the prior 67 trading days of 2012. This massive loss pushed the year-to-date SCP losses over the $ 1 billion mark.

Two weeks later, on April 27, JPM deployed a group of derivatives experts from the Investment Bank to analyze each position within the SCP book. Upon the review's conclusion, the group informed JPM management that the SCP portfolio could experience significantly more losses than initially estimated by the CIO traders and rival firm's

[60]Cohan, William D. *"Exactly Whose Money Did the London Whale Lose?"* Bloomberg. September 23, 2012.

knowledge of the CIO's positions would made the task of unwinding the positions in the book difficult. The majority of the credit derivatives in the SCP trading books were transferred during the second quarter to the Investment Bank, where these positions were closed in the remainder of 2012. In January 2013, the JPM Task Force emphasized that *"CIO no longer engages in the type of trading that generated the losses, and any CIO synthetic credit positions in the future will be simple and expressly linked to a particular risk or set of risks."*[61]

The long and short positions still existed and losses escalated even as the trading book was being terminated. Despite the fact that active trading of the SCP book may have stopped on March 23, cumulative year-to-date losses were reported at $222 million.

On May 10, JPM filed the first quarter financials and, at that time, the SCP book had already suffered $2 billion of mark-to-market losses.[62] The total size of the loss experienced by the CIO ultimately reached $6.2 billion by December 31, 2012.[63] In Dimon's words, the strategy was *"flawed, complex, poorly reviewed, poorly executed, and poorly monitored."*[64] Some additional conclusions of Dimon's determined that "*These were egregious mistakes. They were self-inflicted, we were accountable and what happened violates our own standards and principles by how we want to operate the company. This is not how we want to run a business."*[65]

Banking regulators in the US and the United Kingdom (UK) announced on September 19, 2013, a global settlement with JPM. JPM was penalized a total of $920

[61] JPM Task Force 2013, pp. 110.
[62] JPM Task Force 2013, pp. 73.
[63] US Senate Report, pp. 94.
[64] JPM Task Force 2013, pp. 6.
[65] JPM Task Force 2013, pp. 9.

million by the Federal Reserve Board (FRB), the Office of the Comptroller of the Currency, the Securities and Exchange Commission, and the UK Financial Conduct Authority. An odd event happened as part of the settlements: JPM was required to admit wrongdoing in certain instances.

About a month later, the Commodity Futures Trading Commission also settled with JPM for a penalty of $100 million. The CIO large sale -over $7 billion notional value of protection on the CDX.NA.IG9 index- from February 29 was considered a violation of the Commodity Exchange Act by the Commodity Futures Trading Commission. As a consequence, charges for market manipulation were filed against JPM. JPM agreed to pay a $100 million civil penalty and, at the same time, admitted the findings, including the fact that CIO traders *"acted recklessly."*[66]

Contributory/Control Factors – Book Valuation

The JPM Task Force that investigated the 2012 London Whale incident uncovered evidence that the SCP traders had not estimated fair values in good faith, so the bank restated its first quarter 2012 earnings on July 13, reducing consolidated total net revenue by $660 million (2.5%), which in turn reduced after-tax income by $549 million (8.5%).[67]

Under GAAP, credit and other derivatives must be adjusted to fair value[68] in a company's accounting records every day, a process that is known as *"marking to market."* This is still the case even if derivatives did not trade on a given day. Credit derivatives are

[66] CFTC Press Release 6737-13.
[67] Zissler, Arwin G., Metrick, Andrew. *"JPMorgan Chase London Whale B: Derivatives Valuation."* Yale program, on Financial Stability Case Study 2014-2B-V1, December 2014.
[68] GAPP defines "fair value" as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measured date". (FASB ASC Topic 820-10-30, https://asc.fasb.org/imageRoot/00/7534500.pdf).

not like equity securities that continuously trade on an exchange; instead, they trade in a less liquid *"over the counter"* environment among a small set of financial firms, so price discovery and the estimation of fair value of credit default swaps becomes more difficult. In addition, credit derivatives are generally quoted at wider bid-ask spreads than equity derivatives. Many firms take an even more conservative stance and report their derivatives at the midpoint of the bid-ask spread, JPM IB was in line with this practice, using an independent quote provided by Markit or Totem[69].

Julien Grout, under the guidance of Iksil, had the task of marking the SCP book to market value on a daily basis. By 2012, the CIO traders no longer relied on the IB for assistance as it relates to estimating fair value on the SCP holdings. At the London business day close, Grout would estimate the fair value for each position on the SCP book and submit the marks to calculate the profits and losses for the day. This information would be submitted along with a brief explanation of market activity to the CIO team in New York. Given the difficulty of valuing derivatives properly, banks are required by the national regulators to have an internal process to verify the accuracy of the fair value calculations. At JPM, each unit had a Valuation Control Group; at the end of each month, the CIO Valuation Group Control Group would test the marks internally generated by the CIO traders, and they had the authority to make any adjustments if necessary.

The CIO traders began mismarking the SCP positions in January 2012. The SCP lost money on 17 of the 21 business days that month, given the changes in the credit spread between the protection owned and the value of the protection sold by the traders. During

[69] US Senate Report, pp. 102. Markit provides price data for credit derivatives indices, and Totem (owned by Markit) provides data for credit index tranches.

its review, the JPM Task Force gathered confirmation that Martin-Artajo instructed Iksil to *"estimate the value of positions"* himself, as there was clear evidence that the market became *"irrational"* as the dealer quotes were non-binding.[70]

The mismarking continued through February (losses on 15 of 21 business days) and even March (losses on 16 of 22 business days). Given the massive size of the SCP derivative positions, a minimal change in the fair value mark would result in a very large change in reported losses; for instance, by mismarking the premium by just 2 basis points, Grout was able to show a reduction of losses of $90 million.

Grout's mismarking was known by his superiors. Iksil characterized the SCP book growth as *"more and more monstrous"* and the mismarking process as *"idiotic."*[71]

On March 23, trading was halted on the SCP book after it exceeded the CSW10% risk limit.[72] On March 20, CIO management asked Martin-Artajo for the SCP's result to be included in the first quarter earnings result. The results were estimated at a loss of $150 million. By the end of the day, Grout indicated the number had changed to $200 million. Martin-Artajo asked Iksil if fair value could be adjusted to reduce the number to the $150 million he communicated. Iksil replied it was not possible, and he was asked to leave for the day. Martin-Artajo asked Grout to finalize the results after the New York close. CIO personnel in New York later had to change the number to a loss of $319 million. On April 10, the first day of trading after the first news story[73], Grout issued an initial P&L with a

[70] US Senate Report, pp. 104-105. Non-binding quotes: dealers are not obligated to buy or sell at the prices quotes.
[71] US Senate Report, pp. 112-114.
[72] See pp. 36, last paragraph.
[73] See pp. 38, first paragraph.

daily loss of $6 million, yet 90 minutes later he revised it to an estimated loss of $395 million.

The CIO's mismarking came to light due to a series of collateral disputed, beginning in March, between the CIO and some of its counterparties. By the middle of April, the list of disputed collateral grew to 10 different counterparties, with the amount totaling almost $700 million, the largest with Morgan Stanley for $90 million, Morgan Stanley marks tended to be very close to the IB marks; however, they were extensively different from the CIO's marks.[74] These collateral disputes even came to the attention of the Chief Executive Officer of JPM. As a consequence, Ashley Bacon, the Chief Risk Officer of JPM, was sent to London on April 27 to review the marks used for the SCP book.

As a result of the review, on July 12^{t} JPM terminated the employment of Iksil, Martin-Artajo, and Achilles Macris. Grout was suspended, but not terminated, and he later resigned in December. On August 14, 2013, the United States Securities and Exchange Commission (SEC) charged both Martin-Artajo and Grout with fraud for overvaluing investments to hide losses, basically an accounting matter, instead of actual losses from the failed strategy.[75]

Contributory/Control Factors – Limits, Metrics and Models

JPM's 2011 annual report contains 43 pages of discussion on the primary risks faced by the bank and how it plans to mitigate each one of them, including quantitative and

[74] US Senate Report, pp. 137.
[75] SEC Press Release 2013-154.

qualitative pieces.[76] JPM has three risk limits, Level 1, Level 2, and Threshold, which determine which bank officer sets the limit and gets notified if the limit is breached. Limit 1 is the most important. The risk limits were designated by JPM's Chief Executive Officer and the Chief Risk Officer.[77]

The CIO's risk limits depended on the company's risk appetite, discussed at the annual "Business Review." In real terms, risk limits were routinely breached or exceeded at JPM and other firms, with the response depending on the cause of the breach. As Dimon testified before the United Stated Senate, *"a breach of a Level 1 or Level 2 was not intended to lead to an automatic reduction in risk (in this case, a fire-sale liquidation of positions), but to a discussion about the matter."*[78]

In 2011, US regulators led by the Board of Governors of the Federal Reserve System and the OCC issued a joint statement for the banks under their supervision, titled "Supervisory Guidance on Model Risk Management." According to the OCC, a model is a "*quantitative method, system, or approach that applies statistical, economic, financial, or mathematical theories, techniques, and assumptions to process input data into quantitative estimates"*[79]. The use of financial models inevitably results in "model risk," which is the possibility of bad results (financial losses, bad decisions, and reputational damage to the firm). The Federal Reserve and the OCC suggest that banks approach model risk in the same way they manage other risks, via *"effective challenge"* of the models and

[76] JPM 10-K 2011, pp. 125.
[77] Barry Zubrow until January 2012, and John Hogan thereafter.
[78] US Senate Report, pp. 159-160.
[79] OCC 2011-12, pp. 3.

assumptions. The effective challenge needs to be aligned with appropriate incentives, competence, and influence of the personnel.[80]

One widely utilized model is Value at Risk[81] (VaR), which was developed by JPM in the early 1990s. It has since become the norm in the financial world to measure and monitor market risk by leveraging data on volatilities or and correlations among financial securities to measure potential loss.

In 2011, the CIO decided to replace its 10-Q[82] VaR model. Patrick Hagan, who developed two other VaR models, was assigned by Martin-Artajo to design a new one for the CIO. Hagan and the CIO thought the existing 10-Q VaR model was too conservative, overstating the market risk the CIO was incurring.[83] Consistent with industry practice, JPM calculated the VaR of its portfolios on a daily basis. According to the company's 2011 annual report, the CIO's VaR was based on *"positions, primarily in debt securities and credit products, used to manage structural and other risks including interest rate, credit and mortgage risks arising from the Firm's ongoing business activities"*[84].

On January 15, a day of particularly large trading activity, the CIO exceeded its own $95 million VaR limit and was the principal driver for the breach of the $125 million firm-wide VaR limit. Following company policy, Dimon and other members of the Operating Committee were notified each day the firm-wide VaR was breached. Yet, JPM did not inform the OCC of these breaches because the limit was not used for regulatory

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[80] OCC 2011-12, pp. 4.
[81] OCC defines Value at Risk as follows: *"Value-at-Risk (VaR) means the estimate of the maximum amount that the value of one or more positions could decline due to market prices or rate movements during a fixed holding period within a stated confidence interval."* (US Senate Report, pp. 198).
[82] JPM 10-Q: Quarterly report.
[83] US Senate Report, pp. 169.
[84] JPM 10-K 2011, pp. 159.

purposes but for internal risk management purposes only.[85] Drew failed to order the CIO traders to reduce the size of risky positions as a response to the breaches to the limit. The recently appointed CIO Chief Risk Officer, Irvin Goldman, communicated to his superior Hogan that the best solution to stop the breaches was the implementation of the new VaR model the CIO was planning to implement by the end of January.

Before the approval for the implementation of the new VaR model, the Model Review Group needed to compare the VaR that it would have calculated with the actual profits and losses for the same time period, in effect "back-testing" the estimates. Surprisingly, the Model Review Group was only able to back-test the new VaR of the CIO for two months, because the CIO *"lacked the data necessary for more extensive back-testing of the model."* No reservations were expressed at the time about the time series for the position data.[86] Another best practice suggested by the regulators (OCC) before approving a model is to have parallel runs of the old and new models.

Hagan, after developing the new VaR model, was assigned to implement it and to run it on a daily basis. Hagan was not given funds to create automatic feeds of the data from the firm's trading software, so he needed to manually enter trading data from several systems into multiple spreadsheets every day. The process was rather cumbersome, susceptible to error, and difficult to sustain if the CIO had increased the number of different trading positions. The Model Review Group suggested automation, but the problems were not fixed by Hagan.

[85] US Senate Report, pp. 174-175.
[86] JPM Task Force 2013, pp. 123.

On April 13, 2012, JPM issued the first quarter earnings release, and there was no reference to the change in the CIO's VaR model during the quarter. Moreover, the JPM Task Force investigating the CIO losses uncovered frequent unauthorized changes to the formulas in the new CIO VaR model that, in fact, resulted in calculation errors involving volatility and correlation estimates that incorrectly reduced VaR.[87] As a result, JPM scrapped the new CIO VaR and returned to using the previous model. The earnings release was re-stated on May 10.

Contributory/Control Factors – CIO Compensation

In line with other financial institutions, JPM based its compensation system on incentives *"premised on the basis that assumptions that one of the factors that influence individuals' performance and conduct is financial reward"*[8889]. The CIO group did not have its own incentive compensation structure; instead, it participated in the company incentive compensation plan overseen by the JPM Board of Directors. As a consequence, CIO personnel were paid in line with how other employees at JPM were paid, plus extensive third party compensation benchmarks.

The JPM Task Force prepared an extensive analysis of the compensation received by the CIO group in 2010 and 2011. The intention was to benchmark the compensation and determine if it was more aligned with risk managers (the SCP plays a hedging role) or traders (in which case the SCP plays a proprietary trading role). The Task Force determined that *"there does not appear to be any fundamental flaw in the way compensation was and is structured for CIO personnel"*, but it made very clear that

[87] JPM Task Force 2013, pp. 105.
[88] JPM Task Force 2013, pp. 91.
[89] Ziessler, et al., 2014G.

personnel in the front office who were not expected to generate profits would *"nonetheless be compensated fairly for the achievement of the Firm's objectives, including effective risk management."*[90]

Risk Framework

The JPM Task Force concluded that risk management practices at the CIO were given less scrutiny by senior bank management for a number of reasons.[91]

First, the CIO did not need to meet the rigor of government regulations applicable to areas dealing with clients. In addition, the CIO was not part of one of the six reportable business segments of the bank.[92] Second, the CIO had a good track record before 2012; for instance, the SCP generated $1.8 billion in pre-tax income to the bank from 2008 through 2011.[93] Third, the majority of the CIO's core portfolio was invested in very safe fixed income securities, like Treasury bonds, which is consistent with industry practice as it relates to excess deposits. Fourth, the notional[94] size of the SCP increased from $4 billion to $51 billion during 2011, which is relatively small compared to the CIO's $350 billion bond portfolio resulting from the excess deposits. Fifth, despite the vital role the line of business Chief Risk Officer was supposed to play in the risk management process, the CIO did not have a true and fully dedicated Chief Risk Officer from inception as a stand-alone unit in 2005 until 2012.[95] Sixth, the significant increase in the size of the SCP book in 2011 and the first quarter of 2012 lost visibility given the implementation of the new Value

[90] US Senate Exhibits, pp. 22.
[91] JPM Task Force
[92] JPM 10-K 2011, pp. 79.
[93] JPM 10-K 2011.
[94] The net underlying par value on which credit protection was bought or sold.
[95] JPM Task Force 2013, pp. 12-15.

at Risk model in January 2012, which indicated the CIO market risk profile remained unchanged.

Hogan, who since January 2012 was Chief Risk Officer of JPM, led a self-assessment making an emphasis on three main areas. First, JPM initiated plans to improve model development, review, approval, and monitoring of the key valuation and risk models across all lines of business, with the objective of minimizing model differences for like products, in addition to warehousing all models in a central database, to increase transparency and consistency.[96] Second, JPM significantly revamped market risk limits across all lines of business, adding more clear limits, including several at the portfolio level.[97] Third, JPM created a single risk committee, plus the risk committee meetings included senior managers from inside and outside the CIO, including Hogan.[98]

Dichotomy – Simply Hedging or Proprietary Trading?

The CIO was in charge of a number of difference portfolios. One important question is whether the SCP portfolios over time shifted from a pure hedging role to also incorporate activities that would be characterized as proprietary trading.

Drew confirmed during an interview with the US Senate subcommittee inquiring about the CIO losses that, at the beginning of 2012, the SCP was indeed part of a larger *"Tactical Asset Allocation"* portfolio, which was formerly known as *"Discretionary Trading Book."*[99] During the inquiry, a former co-head of JPM's investment bank corroborated that discretionary trading was in fact a synonym for proprietary trading. The

[96] JPM Task Force 2013, pp. 113.
[97] JPM Task Force 2013, pp. 114.
[98] JPM Task Force 2013, pp. 116.
[99] US Senate Report, pp. 41.

SCP traders could not present any documentation of what the credit risks were, what hedges would be used, or how to test the effectiveness of the hedges.[100]

The CIO and other bank officials provided conflicting answers to the US Senate subcommittee about which assets or portfolios the SCP was supposed to hedge, ranging from the firm's balance sheet to a specific portfolio of the CIO's fixed income securities. To properly function as a hedge, the SCP should have been very profitable in a weak credit environment, exactly at the time in which JPM would be experiencing losses from borrower defaults. Moreover, Drew acknowledged that confirming the size and nature of each hedge would be a *"guestimate"* at best.[101] JPM's corporate counsel told the US Senate subcommittee that the SCP's role was not to function as a dynamic hedge of a specific asset or transaction, but rather was intended to serve as a hedge against *"tail events"* facing the firm, characterized by low frequency yet high severity.

[100] US Senate Report, pp. 4.
[101] US Senate Report, pp. 44.

Sumitomo Corporation

Background

The Sogo-Shosha[102] has traditionally played a key role in Japanese domestic and international trade. It's Japan's version of a multinational. Out of the approximately 11,000 trading companies, only five are classified as Sogo-Shosha in terms of trading volume. These companies contributed significantly to the development of Japanese trade, particularly of Keiretsu[103]; in addition, they have also helped small and medium-sized enterprises to penetrate international markets and integrate into global production chains.

Sumitomo Group, one of the largest Keiretsu, was founded in 1630 and became famous for its copper from Besshi-Dozan, one of the largest copper mines in Japan. The company diversified its business in the late 1800's with business units ranging from Sumitomo Bank, Sumitomo Metals, to Sumitomo Corporation. Since Sumitomo Bank was highly regulated and only allowed to acquire monetary assets, Sumitomo Corporation played the role of investment banking after World War II for the copper trading business as well as others; due to severe competition, Sumitomo lost its position in the copper market. By the 1980's, obtaining a strong position and a positive reputation in the copper market was a significant objective for Sumitomo Corporation.

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[102] Per the Marubeni Corporation: *"The sogo shosha's business model is unique to Japan. They are a reflection of Japan's own unique economic development, first during the Meiji Restoration's period of rapid industrialization and commercialization and then with the rebuilding of Japan's infrastructure and industry following WWII. As such, the sogo shosha have emerged as multi-faceted enterprises with size, scope and diversity not found in other organizations. Needless to say, this makes them virtually impossible to imitate." https://www.marubeni.com/shosha/.*

[103] *A Keiretsu is a Japanese word which, translated literally, means headless combine. It is the name given to a form of corporate structure in which a number of organizations link together, usually by taking small stakes in each other and usually as a result of having a close business relationship, often as suppliers to each other. The structure, frequently likened to a spider's web, was much admired in the 1990s as a way to defuse the traditionally adversarial relationship between buyer and supplier. http://www.economist.com/node/14299720.*

On June 14, 1996, the president of Sumitomo Corp. admitted in front the press that the company had uncovered a significant loss of $1.8 billion, which he claimed had been accumulated since 1986. The responsible party was described as a lone, "rogue" trader, Yasuo Hamanaka. Yasuo joined Sumitomo as a trainee in the Credit department. In 1981, he joined the non-ferrous metals department and did very well, becoming Head Copper Trader in 1986, at the age of 38.

The company quickly rushed to reassure all that Sumitomo, which the previous year had a gross sales turnover of $152 billion, would stand behind the losses. All losses emanated from secret trading on the London Metal Exchange in copper and copper derivatives.

Hamanaka as a trader

Hamanaka developed a reputation in the copper trading circles for his aggressiveness and his willingness to take massive risks. His nickname was “Mr. Copper” and “Mr. 5%” because at one point in time he had direct control over 5% of the world’s physical copper supply. This allowed him to become the most influential copper trader in the world.

A strategist for one of Europe's largest commodity trading banks confirmed that *“Hamanaka has been active trading commodities since 1970. He is no Nick Leeson, no young yuppie who is wet behind the ears. He was widely respected as one of the shrewdest traders in the business. Second, copper is a tiny, closed club of traders. It simply isn't possible to run up losses of $1.8 billion, and go undetected, and that, over more than 10 years. Third, Japanese culture does not produce 'rogue' traders. That's culturally foreign*

to their hierarchical ways. There is a far, far larger scandal here which has yet to emerge."[104]

On June 18, Lyndon LaRouche suggested that: *"The sum of indications is that this is not a Sumitomo derivatives scandal as such, but a more widespread disorder whose extensive nature is being concealed by a tactic of 'over-revealing' the Sumitomo aspect,"* LaRouche also said, *"This is a reflection of a systemic cash crunch throughout the system."*[105]

A coordinated emergency effort was put in place over the weekend of June 15-16 involving the Bank of England, the Bank of Japan, and the U.S. Federal Reserve, among other market regulatory authorities. The purpose of this intervention was to prevent a meltdown of the copper market when trading on the London Metal Exchange (LME), the world's largest metals derivatives and cash exchange, resumed on Monday, June 17. The Financial Times stated on June 17 that the purpose of the emergency coordination over the weekend was to *"prevent a potentially disastrous drop in the metal's price that would have financial repercussions around the world."*[106]

Contrary to the suspicion of some market participants, a loss of $1.8 billion by a trading company with net assets of well over $50 billion and annual sales over $152 billion, hardly seemed a systemic issue. In comments to the press, a senior City of London financial source stressed that: *"At this point the Bank of England has stepped in to exercise day-by-day control of the LME and trading. The copper price collapse has halted for the*

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[104] Engdahl, William. "*The Sumitomo crisis: more than meets the eye*." EIR Economics, Volume 23, Number 27, June 28, 1996, pp. 4-6.
[105] Engdahl, et al., 1996.
[106] Engdahl, et al., 1996.

moment, but only because the Bank has rung up the world's major buyers of copper and pleaded with them to help restore 'order' in the market by not selling."[107] June 17 was the last trading day for the three-month copper derivatives options contracts, and the price that day did fall another $100 per ton before recovering by day's end to $1,990 a ton, down from a high of near $3,000 six months before.

Investigations launched

On June 18, the U.S. Attorney's Office in New York convened a grand jury to examine the Sumitomo losses, as well as to investigate the possible role of a few banks and companies, including, but not limited to, Bankers Trust, J.P. Morgan and Co., and Merrill Lynch. At that time, all three firms had been involved in major derivatives-related scandals and losses. Bankers Trust recently had been fined for misrepresenting the risk in its derivatives products, and Merrill Lynch had been a major party in the Orange County, California, collapse. J.P. Morgan had been implicated in a major financial scandal in 1994 involving Spain's collapsed Banesto Bank. Per market reports, these three financial institutions lost an estimated $230 million in the copper options market in June because of the huge price volatility triggered around Sumitomo's dumping of copper stocks.

Two commodity trading firms were subpoenaed in the Sumitomo case - Winchester Commodities of the U.K., which had been a large client of Sumitomo, and Global Minerals and Metals Co. of New York. The co-founders of Winchester Commodities Group asserted that when details of the transaction (codenamed “Radr”) worth more than $2.8 billion had been finalized, both the chairman and managing director of Credit Lyonnais SA and Akio Imamura had been present. At the time, Imamura was Hamanaka’s boss and a Sumitomo

[107] Engdahl, et al., 1996.

director. The Radr transaction was reported to be one of the largest copper deals that had ever occurred, done at prices well above the prevailing price for copper. Within three months, the LME "effectively forced" the liquidation of the transaction because the purchase had created a pricing curve that appeared to distort the market.[108]

The BIS backing

One week before the eruption of the Sumitomo scandal, the Bank for International Settlements (BIS), the leading international body of major central bankers, issued its annual report, in which it reported a significant growth of trading of over-the-counter financial derivatives, but offered assurances that the risks of such obligations were not alarming. *"It is now widely recognized that derivatives are making an important contribution to overall economic efficiency"*[109]. It further cautioned: *"The fact that the system continued to function well in the face of a number of shocks (Barings, Mexico crisis, Daiwa Bank, and Japanese financial crises) should provide no grounds for complacency. Banking systems are, or will be, under pressure almost everywhere, despite recent improvements in profitability. Financial markets continue to be subject to large unpredictable price swings."*[110]

At the time of this event, the BIS estimated a total of $47 trillion in nominal derivatives contracts, some $40 trillion of which were off-balance-sheet, or so-called over-the-counter trades between two private parties, mostly between banks. In the US alone, during the first quarter of 1996, the derivatives business of American banks alone reached

[108] McGee, S., & Frank, S. E. *"Senior Officials at Sumitomo Approved Big Deals by Fired Trader, Brokers Say."* The Wall Street Journal. July 5, 1996, A3.
[109] BIS annual report, 1996, pp. 140. *https://www.bis.org/publ/arpdf/archive/ar1996_en.pdf.*
[110] BIS annual report, 1996, pp. 166. *https://www.bis.org/publ/arpdf/archive/ar1996_en.pdf.*

a record high of $18 trillion. One week after the BIS report, the $1.8 billion trading fraud involving derivatives speculation on the London Metal Exchange by Sumitomo Corp. was made public.

The trial

On March 26, 1998, two years and two months after the massive Sumitomo positions matured, Yasuo Hamanaka was sentenced in a Tokyo District Court to an eight-year prison term. Hamanaka engaged in a range of activities, from around 1985 until his discovery in 1996, that culminated in a loss of more than $2.8 billion to Sumitomo Corporation. At that time, Sumitomo was the world's largest trading firm in physical copper.

In the London Metal Exchange forward market for copper, participating firms would normally have a three-month exposure through the buying or selling of an options contract. These positions could be rolled over, deferring losses or profits through deferring the settlement date. Hamanaka traded around 500,000 tons of copper per year, a figure that represented approximately 5% of the total annual global demand for copper. Sumitomo was very proud of their dominant position in the copper market and attributed their position to their *"…expertise in risk management. The business principles of the Sumitomo Corporation, framed and hung on the wall in many of the giant trading company's far-flung outposts, warn against speculation. 'Under no circumstances,' they state, should the company 'pursue easy gains or act imprudently'".*[111]

[111] Pollack, Andrew. *"A Sumitomo Loss Felt Around the World; Principles Fall Victim To Practice."* The New York Times. June 15, 1996.

During the trial, evidence emerged showing that during 1985 the head of Sumitomo's copper dealing team at that time, Steve Shimizu, was the one who proposed speculative trading to Hamanaka to recoup pre-existing losses resultant from physical trading activities. Hamanaka stated that Shimizu said that unauthorized futures trading was the only way to recoup the copper team's existing losses. Hamanaka also testified that, at that time, he suspected that his superior was already conducting speculative transactions to recoup losses. By March 1986, the losses of the Sumitomo copper trading team rose to around $50 million. Both Shimizu and Hamanaka decided not to reveal the losses to their superiors, as they were *"too great"*[112].

Shimizu was in the process of being reassigned to Manila by Sumitomo, but he decided to resign, leaving Hamanaka to sort the losses. Although Hamanaka thought the task was initially intimidating, he further testified, he was convinced that over time he could turn around the situation. Shimizu testified that he knew Hamanaka would be left to shoulder the responsibility for the $50 million in accumulated losses, but he also suggested a hypothetical limit that would have triggered a disclosure to his superiors (around $100 million). An additional detail that emerged from the testimony of Shimizu was his contention that *"all data concerning transactions and contracts were entered into Sumitomo's computer system,"* suggesting that with proper oversight and risk management these transactions should have been detected much earlier. Over time, Hamanaka accumulated enough political capital within Sumitomo to allow him to settle his own trades and do his own bookkeeping. During the trial, it also emerged that Shimizu set up his own

[112] Ultimately, the final loss was about 56 times larger than the original $50 million in accumulated losses.

company, Scat Ltd, which conducted business with Sumitomo, and that Hamanaka was paid a portion of the profits made by Scat.

Hamanaka's frauds were almost uncovered in 1991, when an American broker, David Threlkeld, received a letter from Hamanaka requesting him to backdate a fake trade. The broker submitted the letter to London Metal Exchange CEO David King. King contacted Sumitomo about this matter. When Hamanaka was questioned, he denied any wrongdoing, and Sumitomo did not take any further actions.

To cover the $50 million losses, Hamanaka devised a long-term strategy to corner the copper market by manipulating prices and reaping large profits on both copper physicals and futures. To put his plan into action, Hamanaka needed to accumulate a massive number of copper futures contracts without being seen as a speculator, as this would draw regulatory scrutiny. The plan took Hamanaka almost eight years to implement fully.[113] Hence, Hamanaka entered an arrangement to buy copper from Global Minerals & Metals Corp (to be referred to as "Global"). Global would then purchase large numbers of warrants redeemable in physical copper from producers in Zambia, who were in on the deception. What the market did not know was that Sumitomo would then sell the physical copper purchased from Global back to the Zambians, thus completing a triangle cycle of transactions.

Leveraging Sumitomo's financial clout, Hamanaka established $600 million in credit facilities with Merrill Lynch and several other renowned banks. Hamanaka also opened a "B" account at Merrill Lynch for Global. With Merrill Lynch's permission,

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[113] Kozinn, Benjamin E. "*Great Copper Caper: Is Market Manipulation Really a Problem in the Wake of the Sumitomo Debacle.*" 69 Fordham L. Rev. 243 (2000), pp. 277. *http://ir.lawnet.fordham.edu/flr/vol69/iss1/10.*

Global could utilize the credit lines that Merrill Lynch had approved for Sumitomo (which was a significant conflict). Global was given power of attorney and could theoretically trade any way they saw fit. Obviously, neither Merrill Lynch nor any of Sumitomo's other creditors were fully aware of the true nature of the relationship between Sumitomo and Global. With all the angles worked out, Hamanaka initiated his strategy.

During 1993, Hamanaka engaged in the unauthorized sale of deep in the money put options[114] to Morgan Guaranty Trust, which resulted in a loss of $393 million on the transaction. During 1994, Hamanaka ran out of funds again and this time started selling a combination of puts and calls to raise $150 million.[115] Ultimately, the losses that resulted from the sale of these puts and calls amounted to $253 million.

By September 1995, Sumitomo owned warrants on 50% of the physical copper that was traded on the LME; by November 1995, that amount increased to 90%. As Hamanaka also owned by far the biggest futures position in the world, the copper market was now cornered.

The higher prices resulting from the manipulation[116] brought online several mining projects and by the first quarter of 2006, the world supply of copper increased at an annualized rate of 7%, while the demand remained stable. Copper prices did not fall due to Hamanaka's manipulation[117] and cornering of the market, as he controlled both the

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[114] Per Investopedia, *"Deep in the money is an option with an exercise price, or strike price, significantly below (for a call option) or above (for a put option) the market price of the underlying asset. Significantly, below/above is considered one strike price below/above the market price of the underlying asset. For example, if the current price of the underlying stock was $10, a call option with a strike price of $5 would be considered deep in the money." http://www.investopedia.com/terms/d/deepinthemoney.asp.*

[115] Nick Leeson (see Barings Brothers case) also sold a combination of puts and calls called a straddle.

[116] The United States Court of Appeals for the Seventh Circuit defined manipulation as "an intentional exaction of a price determined by forces other than supply and demand".

[117] There is a four-part test most commonly used by courts when deciding manipulation cases. The Seventh Circuit (*Frey v. Commodity Futures Trading Commission*) outlined the four elements necessary to prove

certified cash market (physical) and the futures market. The constricted cash market resulted from copper continuously flowing into LME warehouses, while none ever seemed to leave.[118] Consequently, cash copper began to exceed the prices for copper futures. This inversion of futures prices to cash prices, referred to as "backwardation" by market participants, may signal someone is trying to control the supply of a commodity.[119] Yasuo Hamanaka did, in fact, capture almost 93% of the physical supply of copper in addition to a significant futures position on the LME, thus causing prices to rise to extravagant levels.[120]

The volatility in the price of copper caught the attention of legendary short seller George Soros and a consortium of hedge funds, which initiated a short selling campaign. Hamanaka bought huge quantities of it on the LME to try to keep copper prices high. After several weeks, Sumitomo's vast resources proved to be too much, and Soros and his colleagues ceased their efforts.

In May 1995, when Hamanaka was removed from his position, no one was countering the short selling and the price of copper collapsed, causing massive losses resulting from Hamanaka's positions that were dependent on high copper prices.[121] Total

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manipulation: (1) the *ability* to influence market prices; (2) the *intent* to execute a squeeze [or corner]; (3) that *artificial* price existed at the time of the offense; and (4) that the *accused* caused the artificial price. Artificial price: "a price that does not come about through transactions reflecting basic forces of supply and demand working in an open, efficient and well informed market."
http://ecomms.gtlaw.com.au/rv/ff0010b2ae33db40a261b50fa746b4764ddeb75a/p=6642990.

[118] Kozinn, et al., 2000.

[119] Das, Satyajit. *"Risk Management: The Swaps and Financial Derivatives Library."* Wiley Finance, 3rd Edition, October, 2005.

[120] Kozinn, et al., 2000.

[121] Kozinn, et al., 2000.

losses to Sumitomo eventually rose to more than $2.5 billion. Sumitomo's chairman resigned.[122]

Per the 1997 testimony of Yoshio Takeuchi, the then assistant general manager for the nonferrous metal, chemicals, and petroleum group of Sumitomo, there were newspaper articles in the British press that claimed that Sumitomo was acquiring massive positions in copper warrants on the London Metal Exchange (LME), sparking an internal investigation by Sumitomo that found that those allegations of market manipulation were unfounded and untrue. A few weeks later, Takeuchi testified to the fact that Sumitomo Head Office in Japan had an agreement with its subsidiaries, like Hong Kong, where contracts that exceeded credit lines could only be approved after a process of mutual consultation. This limit was, in the 1980s, set at $1 million for the Hong Kong subsidiary but was changed in 1994 after Hamanaka regularly exceeded his limits, in one instance by $100 million in a transaction with Credit Lyonnais Rouse (CLR). Takeuchi testified that the General Manager was alerted to this transaction, but no significant action was taken. Hamanaka's defense proved that all the Hong Kong subsidiaries' transactions were conducted under instructions and with the funding of Tokyo. When confronted with Sumitomo records of numerous transactions conducted by Hamanaka that exceeded his trading limits, Takeuchi responded by saying he could not remember, did not know, or *"…was not in a position to be able to know"*. These incidents of amnesia also affected other Sumitomo executives during the inquiry.

[122] Ewing, Terzah. *"Sumitomo Suit to Be Settled For $99 Million."* The Wall Street Journal, August 13th, 1998, C17.

During the trial, Hamanaka's defense team questioned Hiroshi Nishino, the former credit manager for Sumitomo Corporation, on how it was possible that all these massive positions remained hidden from him and senior management at Sumitomo. Some of the documents related to the huge copper transactions that were presented to Nishino included correspondence between the president of Sumitomo and the president of its Hong Kong subsidiary, clearly indicating their knowledge of at least some of these very large transactions. In the same way, when asked how he as head of credit missed the transactions between CLR and Morgan Guaranty Trust & Co, in a regime where all transactions by any subsidiary over $20 million needed approval from Tokyo, Nishino's memory failed him.

Similarly, Hamanaka's defense also proved that senior management was at least aware of one suspicious transaction of $320 million that was detected as an unpaid account during September of 1993. At around the same time, credit lines were set for all dealers and brokers with whom Sumitomo was dealing. When questioned about this matter, Nishino denied any document was ever sent by his staff to Tokyo on his orders. It is clear from the evidence presented by Hamanaka's defense that there were numerous occasions when his transactions could have been detected over an extended period. As a consequence, it is not surprising that in May of 1998 the United States Commodity Futures Trading Commission (CFTC) imposed a fine against Sumitomo Corporation for manipulating the copper market[123]; Sumitomo eventually had to pay the CFTC $125 million to cover its time and effort and had to pay FSA £5 million, a minimal penalty for a multibillion dollar multinational.

[123] The CFTC could not initially identify the controlling party due to a slow response and denial by the LME of any market irregularities. This kind of collaboration -between exchanges and agencies- could potentially have stopped Mr. Hamanaka's manipulation much earlier. Kozinn, et al., 2000.

Lessons from the Sumitomo Debacle

One of the first indications that something was amiss came in 1991, when David Threlkeld, a metal broker trading on the LME, reported a request by Hamanaka for an invoice for non-existent trades. As we know from the trial, Sumitomo was advised no clear action was taken. Sumitomo Corporation failed to execute a consistent management job rotation policy, Hamanaka's dominant position in the copper market made him almost untouchable inside the corporation as well as outside, and no one dared to challenge his transactions or trading accounting. In 1994, the SFA (Securities and Futures Authority) investigated the trading activities of Winchester Commodities and a Chilean trader acting for a firm called Codelco. The SFA uncovered the fact that Winchester made virtually all its profits from its brokering activities for Sumitomo. Again, no action was observed from Sumitomo's management. The third warning was probably the most compelling. By early 1996, regulators from both the United Kingdom and United Stated expressed concerns about the behavior of the price of copper. The Tokyo Commodity Market Regulators' Futures Conference concluded that *"the combination of the current regulatory scheme, tougher monitoring of the hedging exemption, and continuing cooperative efforts by international regulators will protect prices on U.S. markets and stifle the efforts of traders, such as Hamanaka, who attempted to move prices by acquiring market power"*.[124] As was mentioned earlier, production was outstripping demand by a substantial margin, and the price of copper continued to climb, so it is difficult to believe that, as the largest player in the copper market globally, the executives of Sumitomo, who would have had access to the most research on the behavior of copper prices, did not seriously question this anomaly,

[124] Kozinn, et al., 2000.

unless they were aware of or at least suspected the reason for it. Fourth, Sumitomo should have created a separate and independent team to verify prices and trading accounts. This would have served as a control. After 1996, many governmental agencies, including some in Japan, established new rules that established a division between middle/back office and the front office. Finally, in terms of corporate responsibility, Sumitomo's management waited ten days to issue a press release. Additional declines in copper prices could have been avoided if Sumitomo had issued a press release earlier, given the number of rumors and uncertainties in the market with the biggest physical stock of copper metal.

UBS

Background

UBS AG is a Swiss global financial services firm, incorporated in the Canton of Zurich. It is the result of the merger of Union Bank of Switzerland and Swiss Bank Corporation in 1998; in 2000, it merged with PaineWebber. UBS is a clear example of a "Universal Bank," providing products and services ranging from asset and wealth management to corporate, investment, and consumer banking. Compared to its European peers, UBS suffered massive losses during the subprime mortgage debacle and massive capital injections were required. As a consequence, in 2007 Singapore's sovereign fund (GIC Private Limited) injected $9.7 billion in capital and today remains as one of the bank's largest shareholders. The company logo contains "three keys" symbolizing *"confidence, security, discretion"*.

The bank's board met the afternoon of September 23, 2011, to discuss the loss of $2.3 billion by an alleged rogue trader out of its investment bank arm in London. During this session, the board decided unanimously to accept UBS chief Oswald Gruebel's resignation, even though the board had not gone public yet with the news; at the same time, an interim replacement was appointed.

The immediate crisis was not the only cause for Gruebel's decision to leave, but also a capitulation in his two-year campaign for fewer bank regulations. The rogue trader also killed any hopes of competing with Wall Street investment banks. More strict regulation was visible on the horizon, as he admitted in a memo sent to staff after his

resignation, saying *"that it was possible for one of our traders in London to inflict a multi-billion loss on our bank through unauthorized trading shocked me, as it did everyone else, deeply. This incident has worldwide repercussions, including political ones"*[125]. While the Swiss parliament narrowly rejected a proposal to ban investment banking outright, governments in other parts of the world prepared regulations such as the Volcker rule, which bans proprietary trading by investment banks.

At the same time, European banks like UBS and Deutsche Bank significantly reduced the size of their balance sheets, by at least a third since 2007, and continued doing so to meet Basel rules on capital. In August 2011, UBS announced it would continue with the restructuring, which meant a reduction of 3,500 in headcount and a cut of 2 billion Swiss francs ($2.2 billion) in annual costs, almost half of that impacting the investment bank. Interim CEO Sergio Ermotti, who until then ran UBS's European operations, told journalists that bankers needed to adapt to a new reality, where investment banking *"is an industry that is due to shrink, not due to expand. Therefore, anybody who wants to have a job and who is really keen to be in this industry will have to accept this new paradigm"*[126].

Bad news

Per Swiss magazine Bilanz, the beginning of the end was triggered by a call from Carsten Kengeter, who a year earlier had been promoted to head of investment bank, to Gruebel indicating that risk officers had uncovered massive unauthorized trades, leaving the bank exposed to massive losses, probably amounting to billions of dollars. UBS was

[125] Thomasson, Emma, Taylor, Edward. "*Special Report: How a rogue trader crashed UBS."* Reuters, September 26, 2011.
[126] Thomasson, et al., 2011.

on the mend with its wealthy private banking clients after risky bets on subprime mortgages came close to bankrupting it in the financial crisis of 2008.

Kweku Adoboli, a 31-year old trader who had joined the bank five years earlier as a trainee and worked in the equities division, was being interrogated by executives and lawyers. The discovery of the trades came to light when controllers making routine checks demanded clarification for positions that were due to settle on September 22, 2011. Some insiders described the news as “cataclysmic”. Once Adoboli became exposed, he reported himself to his boss, John Hughes, who then alerted his superiors. Britain’s Financial Services Authority as well as FINMA, Switzerland’s regulator, were also notified. Both Gruebel and Kengeter, as former traders, knew they had no time to spare. A small taskforce -named “Project Bronze”- was quickly assembled to immediately close Adoboli’s positions. The next morning, as the impact of the incident became clear, UBS promptly informed City of London police, who arrested the trader at UBS’s London headquarters. Soon, executives in Zurich had a sequence of meetings to decide the approach to go public with the news.

The Project Bronze team continued to unwind Adoboli’s positions as Asian markets operated, maintaining a balance between regulatory requirements and concerns about tipping off the market about the situation, something that could quickly exacerbate the losses. About two-thirds of the positions were closed overnight, the scale of the loss became clear, and, with the arrest, executives were running against the clock as the Swiss stock exchange had to be informed by 7:30AM. UBS’s media department rushed to prepare a statement. Five minutes before European markets opened, the bank announced the loss, estimating it at $2 billion, which made it one of the biggest rogue trading events

in history. Almost immediately, UBS's stock tumbled, losing more than 10 percent which represented $5 billion of the company's market capitalization. Bankers confirm Adoboli's positions were completely closed by the next day. UBS's Chairman Kaspar Villiger said Kengeter and his team did a fantastic job to limit the extent of the losses, a different picture than the one faced by Société Générale as in that case hesitation increased the losses.

Déjà Vu

On September 15, 2011, as the news hit the screens on the UBS trading floor, speculation over the identity of the trader and the size of the loss began almost immediately but subsided quickly as the desk dealing in Exchange Traded Funds (ETFs) was *"noticeable by its absence"*[127]. For a moment, the fixed income division was under suspicion for its role during the mortgage crisis in 2008. The announcement coincided with the third anniversary of the 2008 Lehman Brothers debacle; markets were very volatile, and there was unprecedented stress in the Euro zone as Greece was on the brink of a sovereign default.

Staff was quick to realize the issue resided in the equities area, when investment bank head Kengeter and other senior management did the rounds of the London trading floor and assured staff the situation was under control. Later that day, Gruebel said in a memo sent to employees, *"we understand that you have already had to contend with unfavorable, volatile markets for some time now. While the news is distressing, it will not change the fundamental strength of our firm"*[128]. Communications did little to stop the humor and rumors of UBS staff, who were already worried about job cuts. A senior banker

[127] Thomasson, et al., 2011.
[128] Hume, Neil. *"UBS rogue trade – details of the fictitious trades."* Financial Times (Alphaville), September 18, 2011.

in Zurich said that *"the joke going around is that Gruebel didn't need to sack 3,500 people to save 2 billion. He could have just sacked ONE"*[129].

John Hughes, who had already handed in his resignation, was indicated as one of the guilty parties, but soon it became clear that the man in police custody was Adoboli, a Director of ETFs in the equities division.

Immediately parallels were drawn with Kerviel, the SocGen trader who racked up a $6.7 billion loss in unauthorized deals in 2008. Both Kerviel and Adoboli worked with Delta One products, which closely track securities and give the owner the ability to gain exposure to a cadre of asset classes.

UBS cancelled briefings with Swiss journalists on Delta One. Almost in parallel, Adoboli was charged in London, accused of one count of fraud by abuse of position and two counts of false accounting. The police decision to charge Adoboli put the UBS legal advisers at odds, as they had planned to update the market. Any explanation would have risked putting UBS in contempt of court. By Friday's market close, UBS stock recovered half of the previous day's losses, driven by the expectation of a restructuring of its investment bank – at that time the loss estimate increased to $2.3 billion. British and Swiss regulators announced the creation of a task force to determine the losses to be paid for by the bank and why the trades had gone undetected. Rumors included the idea of a separate listing of the investment bank, which would mean an investment bank without the backing of deposits.

[129] Thomasson, Emma, Taylor, Edward. *"Behind the scenes at UBS."* Reuters, September 26, 2011.

Under pressure

Pressure did not subside around Gruebel. UBS Honorary Chairman Nikolaus Senn conceded to Swiss television that he did not think the CEO would be able to resist because he and the board ultimately had the final say on what happened at the bank. Swiss politicians from the Social Democratic party, Switzerland's second-biggest party, who wanted to impose a ban on big banks from engaging in risky investment banking, demanded Gruebel's immediate departure. One of the statements read, *"Arrogant and irresponsible managers like Oswald Gruebel must finally be replaced by people who have learnt the lessons of the 2008 financial crisis"*[130]. Some senior employees added that *"this is a catastrophe. They have had six CEOs since 1998. It is such a management merry-go-round. They have such a strong franchise but it is simply a problem of governance: too much change at the top and not the strongest board of directors"*[131].

Gruebel, who was brought out of retirement in 2009 to turn the bank around, was a former CEO of Credit Suisse and was fully determined to resist any pressure. During the weekend, Gruebel and his staff focused on an additional statement to the media. *"We have now covered the risk resulting from the unauthorized trading, and the equities business is again operating normally within its previously defined risk limits"*[132]. The statement lacked substance and left many questions unanswered – for instance, how did the trades go undetected for so long? Controllers began asking questions in July. One practice that caught their eye involved "internal futures," trades that used other parts of the bank to cover Adoboli's positions and did not require any confirmation. When Adoboli became aware

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[130] Thomasson, Emma. *"UBS CEO Gruebel in firing line over rogue loss."* Reuters, Sept. 19th, 2011.
[131] Thomasson, et al., 2011.
[132] Hume, et al., 2011.

of the attention this practice was receiving, he switched to forward-settled trades that used exchange-traded funds and exploited the gap by entering names of counterparties that did not require confirmation before the settlement day, allowing him to fool the system into believing these fake trades were real. These activities extended from June 1, 2011, thru September 14, 2011. The derivatives utilized by Adoboli included EuroStoxx, DAX, and S&P 500 index futures.

On November 20th, 2012, Adoboli was convicted of the two counts of fraud by abuse of position and acquitted on four counts of false accounting. He was sentenced to seven years in prison.

Regulatory findings

At the beginning of 2011, the Global Synthetic Equities group was created after a restructuring of the Global Equities business area. It combines the synthetic equity products. The Exchange Traded Funds Desk, where Adoboli worked, was one of the last ones to be transferred under the new umbrella in April 2011. The products traded by the desk were cash equities, equity futures, and equity index funds. At the time of its transfer, the desk limits were set at $50 million net overnight and $100 million net intraday.

On September 22, 2011, the FSA and FINMA ordered UBS to appoint an independent person to conduct a detailed investigation about the rogue trading incident. The independent investigator determined that the main cause for the loss-making positions was the concealment via fictitious off-setting trades which appeared to be profitable. Additional findings included the booking of unmatched trades to internal counterparties - the front office risk system allowed internal futures trades to be booked on a generic counterparty (internal) and did not require a mirror trade or identification of the

counterparty-, late booking of trades -which allowed for manipulation of profit and loss-, and the use of false ETF trades with a deferred settlement date, off market prices, and amendments to the prices.[133]

In terms of the control environment, UBS had designed and implemented several controls to prevent unauthorized trading. The bank followed the classic model of three lines of defense. The first line focused on oversight and supervision, price verification, and settlements of trades by the trading desk. The second line contained the Compliance, Finance, and Risk functions. The third line was the Internal Audit of UBS. The independent investigator pointed out a significant number of control breakdowns which allowed the rogue trading to remain undetected: front office supervision was inadequate, with desk limit breaches not adequately addressed by management; the level of coordination and cooperation between the front office and back office was deemed ineffective, as there was a lack of understanding of the trading activities; and the back office lacked the capability to identify, challenge, and escalate[134] any significant control gaps up the chain of command.[135]

Gaps and behaviors specific to the First Line of Defense

As indicated earlier, the desk was transferred into the GSE Division in April 2011, and the transfer of the supporting infrastructure was intended to be in phases. The initial date for completion was September 2011, but it remained incomplete at the time the losses were identified.

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[133] FSA (Financial Services Authority). Nov 25th, 2012. *"Final Notice,"* pp. 5. https://www.fca.org.uk/publication/final-notices/ubs.pdf.
[134] Per TechTarget: *"An escalation plan is a set of procedures set in place to deal with potential problems in a variety of contexts."* http://searchcrm.techtarget.com/definition/escalation-plan.
[135] FSA 2012, pp. 6.

Prior to the transfer the desk had a supervisor in London, who sat close to the trading desk. Once the transfer was completed, the desk was supervised by a US-based supervisor. The previous supervisor continued receiving reports, even though he no longer had any additional responsibilities over the desk.

The desk breached the desk limit on four occasions between June 23 and July 15, 2011. In all occasions the breaches were escalated up the chain of command but no action was taken. On one occasion the desk's supervisor congratulated the team on the profit, but made clear the rules related to the risk position above the limits. On the other occasions, no action was taken, nor was any investigation initiated.

On August 8, 2011, the desk was informed that the reconciliation process uncovered several breaks due to late booking of external futures trades. The desk supervisor informed Operations that he had had a conversation with Adoboli and would personally book the trades for him that day. On August 18, 2011, the desk supervisor was notified that a significant number of breaks were observed on internal futures. Adoboli explained that he was building a position for an ETF provider and had been too busy, so he incorrectly booked the internal futures instead of ETFs. The desk supervisor communicated this practice as unacceptable in writing, but this was never investigated.

The desk's recorded net revenue increased significantly between 2010 and 2011. In 2011, the net revenue for the desk was $9 million for the year. In the 1st quarter of 2011 the number climbed to $21 million, and by the 2nd quarter of 2011 it reached $52 million. The increase was several times larger than the set risk limits, but no inquiries were made. UBS supported the personal supervision of the desk with some automation, specifically a computer system called SCP (Supervisory Control Portal) that was fed with various data

streams, including the trading desk deal capturing system and the front office risk systems. The SCP generated the profit and loss reports, risk reports, and other reports containing approval of amended, cancelled, and late trades. As indicated above, some of the reports were sent to previous supervisors of the desk, but the system was not fully functional until August 26, 2011, so the reports generated were only sent to the traders on the desk and not to supervisors. A UBS insider indicated: *"It suggested a complete failing of risk management systems, although adding there's no guarantee systems are any better elsewhere"*[136]. Another source said: *"I think systems were pretty weak. If you were to ask what risk systems lie behind a lot of their businesses that take a lot of risk it is a lot of spreadsheets"*[137]. Another rival observed: *"Systems don't protect you from fraud, but when you have weak systems fraud becomes easy"*[138].

The purpose of the Operations division was to establish and maintain a robust control environment to ensure accuracy and completeness of the trading positions, plus ensuring integrity of the relevant systems and counterparties. The responsibilities included confirmations, reconciliations, and end of day reporting (which included amended, cancelled, and late trades). This was not the case, however, as the division acted as a supporter of the front office resolving and clearing any trading breaks. No challenge to or questioning of traders was observed. As a consequence, the division's role revolved around driving efficiency instead of performing needed controls. As middle office staff aspired to have roles in the front office, this generated an incentive for lax control. The reconciliation process detected some of the breaks generated by the unauthorized trading. Rogue trading

[136] Hatch, Brad & Moullakis, Joyce. *"UBS and the rogue excuse."* Australian Financial Review, 2011, pp. 49.
[137] Hatch, et al, 2011.
[138] Hatch, et al, 2011.

is often committed by people who move from the back or middle office to the front office. Philip Molyneaux, Professor of Banking and Finance at Bangor University, says, *"They know about the mechanics of the back office and have the skills to circumvent systems fraudulently. They tend not to be high fliers. They are doing relatively modest trades but they start losing money. Then, to save face or their jobs, they start undertaking fraudulent activity of a small scale to cover their problems. The problem accelerates and they have to run faster to cover up the losses. These escalate until they get so large that the fraud is uncovered"*[139]. Adrian Kinnersely, managing director at Twenty Recruitment, says: *"I wouldn't be surprised if, at some point, there will be regulatory controls to stop back- and middle-office people being promoted to the front-office at the same bank. This could have a significant knock-on effect for juniors joining banks in back- and middle office finance roles with the dream of becoming the next Gordon Gecko"*[140]. Other market practitioners have a different opinion, like Alastair Goddin, head of risk management at Omega Insurance, who does not think that stopping back office people from working in the front office would deter rogue trading. *"For starters, it assumes people will put all relevant experience on their CVs when changing roles and that people in the front-office don't have friends or family in back-office roles,"* he says. *"In general, preventing people from doing certain things by trying to ensure they don't know how to do them is a weak control – people have a tendency to work things out if they want to"*[141].

[139] ACCA (Association of Chartered Certified Accountants), *"System failure?":* pp. 54. *http://www.accaglobal.com/content/dam/acca/global/PFD-memberscpd/InternalAudit/System_failure.pdf.*
[140] ACCA: pp. 54.
[141] ACCA: pp. 54.

Gaps and behaviors specific to the Second Line of Defense

The Finance Group's role was that of Product Control. This role included understanding and validating the profit and loss and trading positions at any point in time. The group could suspend or adjust profit and loss to reflect delayed pricing of marks or to reflect booking errors or timing differences on trades. Adoboli requested profit and loss suspensions of $1.6 billion during August 2011. No challenges or reports to senior management were observed by the product controller. The increase in profit and loss recorded by the desk between 2010 and 2011 was not investigated by Product Control. David Sherriff, chief executive of banking software provider Microgen, says most banks have implemented risk controls in line with the Basel II and Sarbanes-Oxley regulations, but he adds, *"The complexity of systems and the spaghetti nature of ageing IT architectures inevitably mean there are manual workarounds for emergencies"*. Manual intervention, user-driven systems and complex integration all create opportunities for fraud. Sherriff says, "*Banks should be looking at improving the quality and availability of data, particularly within the finance and risk operations. It's important that risk data acquisition and analysis is simplified through more automated and robust mechanisms"*[142].

The Operational Risk Control division of UBS conducted a detailed review of all practices and procedures considering the rogue trading incident at Société Générale. The report concluded that no evidence was found in 2008 of control deficiencies at UBS that could be exploited over an extended period, yet unauthorized trading could not be fully prevented. Several weaknesses were identified. First, amending and canceling reports proved ineffective to identify off trading patterns. Second, front office supervision was lax

[142] ACCA: pp. 54.

due to lack of effective management reporting. Third, the culture discouraged challenges by the control functions. Fourth, there needed to be a review of controls for the ETF area given the level of complexity. Managing Director of Dedication Group Greg Pritchard says of the UBS trades, *"If it was an exchange-traded product, that should be systemized… Your system should be able to handle those. When you have more sophisticated trading strategies the technology [cant'] keep up"*[143].

In December 2010, Operational Risk Control performed a follow up review which indicated the implementation of SCP, improvements in management reporting and supervision because of the new system, and a culture that was stronger due to the implementation of clearer communication and training. A senior investment banker says risk management is a culture ingrained over years of best practice and constant education. *"You can't buy it, build it overnight or manage it on spreadsheets,"* he says. *"It comes from having the right people with the right behaviors, compensation systems and culture"*[144]. Molyneux asserts that one of the challenges is the aggressively competitive deal-making culture: "*When there are people who have positions that may be short tenure if they don't perform well, there is an incentive that a rotten apple will undertake fraudulent activity"*[145]. Goddin argues that culture and structure go hand in hand: "*The risk of someone performing fraudulent acts is greater when they are left to their own devices in a big-team environment. Small tightly knit teams are more likely to be aware of one individual's personal circumstances and behavior"*[146].

[143] Hatch, et al., 2011.
[144] Hatch, et al., 2011.
[145] ACCA: pp. 54.
[146] ACCA: pp. 54.

Gaps and behaviors specific to the Third Line of Defense

The Internal Audit Group acted, as expected, independently reporting directly to the Chairman of the Board of Directors and to the Risk Committee. The focus of this group was to review the company's control and governance processes and its risk management practices with the objective of improving their effectiveness and resilience.

The independent investigation only conducted a brief review of relevant audit reports. In June 2010, the Internal Audit Group found some issues which included the need to implement analysis of red flags and reporting, lack of delegation during absence or leave, failure to ensure the desk supervisors always received the reports needed to perform their duties, and lack of monitoring by Compliance over the use of the SCP to review and investigate irregularities. These issues were deemed as medium risk, so they were not forwarded to the Board Risk and Audit Committees.

Lessons learned from the UBS incident

Any front office trader who formerly worked in the back office should be monitored closely, as back office employees gain extensive knowledge about the proper procedures for documenting and booking authorized trades, and, potentially, how to circumvent those controls without raising any red flags. Adoboli's back office experience likely gave him ample experience and knowledge about UBS's treatment of internal trades and its trades with external financial institutions; all this knowledge was critical for concealing unhedged trades.

There is ample evidence that UBS inadequately supervised Adoboli's activities. After discovering the details of Adoboli's fraud, John Hughes resigned. One factor that

possibly contributed to this lax supervision is the fact that UBS's London investment banking operations are set up both as a subsidiary and a branch, so its operations are regulated by both UK and Swiss regulators. Inadequate supervision and management of traders should also be considered a risk for facilitating unauthorized trades. Investment banks need to be crystal clear about what regional office is ultimately responsible for governing a trader's activities. The trading operations in London and Switzerland may have thought that the other one had primary responsibility for supervising Adoboli; to make matters worse, though, the desk supervisor was in the United States and did not receive all the reports needed to have the full picture and act on it.

Paul Moxey, head of corporate governance and risk management at ACCA, believes a shift in culture is vital to solving the rogue trader problem. He says: *"In most organizations, people get some satisfaction from their work beyond the money they earn. But if you're working in a bank trading culture, there's no intrinsic value to society. The amount of money you make is your fixation. Anything goes as long as it's making money and it's within compliance. So traders sail as close to the wind as they can, but sometimes they go too close"*[147].

UBS had insufficient and ineffective control and risk management practices, as Adoboli's fraudulent trades allegedly dated back to 2008, and the company's risk managers only became aware in July 2011. The controllers did raise red flags, but no action was taken by risk officials or management as they waited until mid-September to question Adoboli about his trades. Such a delay most likely magnified UBS's losses.

[147] ACCA: pp. 54.

Adoboli and Kerviel evidenced that Delta One desks pose a risk for unauthorized trading, namely, that a trader will make large bets on future stock market moves, but fail to purchase the required off-setting hedge. Both created fake transactions that did not involve cash flowing in or out of the bank or that did not require confirmations. These fake transactions gave the false appearance of fully hedged Delta One transactions at UBS and Société Générale.

After the $50 billion losses from mortgage-backed securities in 2008 and 2009, UBS claimed a significant investment in and upgrade of risk and control systems; however, these changes addressed compliance flaws that allowed UBS to concentrate too many resources on a specific asset, yet did not address the risk that traders could make fraudulent trades. UBS risk-control systems may have been inadequate, and all financial institutions that participate in trading, especially with derivatives and leveraged products, should upgrade their controls and risk management tools to ensure no additional rogue traders strike again.

Showa Shell Sekiyu K.K.

Background

Showa Shell Sekiyu K.K. was a partially owned Japanese subsidiary of the oil giant Royal Dutch Shell.[148] In early 1993, Showa Shell announced a massive loss stemming from foreign exchange exposure. The size of the loss was $1.07 billion (or ¥125 billion), equal to five times the company's pre-tax profit. When Takashi Henmi, Showa Shell's President, initially brought the matter to the attention of the parent company's executives, they kept requesting a correction and confirmation of the loss, assuming that the decimal point was erroneously transmitted, expecting losses in millions rather than billions of dollars.

The debacle

Per internal records, the losses could be tracked to 1989 when Showa Shell Treasury utilized 90-day forward contracts to hedge the company against the risk of a depreciating yen/appreciating dollar. However, what began as a legitimate intent to hedge as part of the normal course of business suddenly turned into a significant currency exposure of $6.4 billion, which was clearly a breach of the company's internal control procedures.

[148] Showa Shell was 50% owned at the time of this event. In July 2015, it was announced that Shell would sell its 33.24 stake in the company to Idemitsu Kosan. Shell will keep a 1.8% stake in the company. Idemitsu Kosan is a Japanese petroleum company that owns and operates oil platforms and refineries and produces and sells petroleum, oils, and petrochemical products. It is the second largest petroleum refiner in Japan, after Nippon Oil.

The general manager, Yukihusa Fujita, with the intention of concealing the losses rolled over the forward contract at the time of expiration in order to avoid settling the cash losses. However, the yen continued to rise, and soon the foreign exchange losses would spiral out of control.

The loss came to light in late 1992, when a banker casually mentioned the size of the position to a Showa Shell Treasury executive. Processes put in place to mitigate these risks failed, and lax auditing and negligent internal controls of foreign exchange trading operations kept the problem hidden from Showa Shell's senior management.

The loss was officially disclosed on February 20, 1993, with a size equal to about 80% of Showa Shell's shareholder equity. The announcement triggered a selloff in the company stock, which declined from ¥1500 to less than ¥800. The next day the treasurer was fired and the company's Chairman and President announced their resignations. Two supervisors later resigned for allegedly knowing about the unauthorized trades but not taking any actions[149].

Several questions arise. How could an oil company whose main activities centered around the refining and retail distribution of petroleum products suffer such a significant foreign exchange loss amounting to five times its annual profits? What led to these losses – reckless speculation by rogue currency traders or a poorly planned and implemented hedging strategy? It is very interesting how traders could hide large scale speculation from their bosses and controllership with the excuse of hedging oil imports.

[149] Reszat, Beate. *"The Japanese Foreign Exchange Market."* Routledge, 2002.

General currency hedging practices at petroleum companies

Japanese oil companies are primarily engaged in downstream activities, mostly domestic refining and distribution of fuel and motor oil through company-owned petrol stations. This is a significant difference from other petroleum multinationals which are generally vertically integrated, performing oil exploration and extraction through refining and distribution. Japanese oil companies are solely dedicated to the Japanese market, importing much of the commodity extracted by other companies in other countries for further refining and distribution. This activity exposed Showa Shell financially as the price of crude oil is set in dollars. As a consequence, the company was exposed to fluctuations in the price of oil and the yen/dollar exchange rate.

On the revenue side of the equation, Showa Shell would receive inflows in yen from the sale of refined products to transportation and airline companies, motorists, and utilities. Due to price controls, Showa could expect a stable stream of income both in terms of price and quantity, as it controlled about 12% of the Japanese market. On the cost side of the equation, Showa Shell had to deal directly with two significant factors that over the short term could impact the cost of the crude oil it needed to operate. Any surprise increases in operating costs due to spikes in the yen price of the dollar or the price of oil would impact the company's operating margins and profits, which were not easy to correct due to the government price controls on the final product. This was the main driver behind hedging the dollar transaction exposure and potentially the oil price exposure; the oil price exposure depended on the quantity of the commodity that Showa Shell negotiated and ultimately acquired from Royal Dutch Shell via long-term fixed price contracts.

The mechanics of hedging dollar exchange rate risk and oil price risk

On average, Showa Shell imported an average of 15 million barrels per month – the company's refining capacity was about half a million barrels[150] – and its currency exposure was normally hedged leveraging 90-day forward contracts. These instruments locked the cost in yen of the petroleum imports in terms of dollars; the company was hoping to protect against the appreciation of the US dollar which would result in less oil to sell. Otherwise, Showa Shell performed a "money market hedge" or "synthetic forward contract" which consists of directly borrowing from Japanese banks, turning the proceeds of the loan into dollars, and accumulating interest in bank deposits.

Alternatively, Showa Shell could buy dollar call options at the money; thus, if the dollar appreciated beyond the strike price of ¥145, Showa Shell could exercise the option to purchase dollars at ¥145[151]. On the other hand, if the dollar depreciated below ¥145, Showa Shell could simply acquire dollars at the spot price (more favorable). The convenience of having both alternatives meant it had to pay a cash premium upfront, which could be equal to as much as 3% of the face value of the contract; in the case of a notional of $300 million, the premium would be $9 million.

Showa Shell currency traders opted for the forward hedging option for just one reason: the money market hedge and the call option would leave a paper trail that would lead to them. The mark would even be visible in the financial statements of the company – the money market would have appeared on the balance sheet not only as an additional yen

[150] *http://www.showa-shell.co.jp/english.* As of 02/28/2017, the combined capacity of the three Group refineries (Yokkaichi Refinery of Showa Yokkaichi Sekiyu, Keihin Refinery of Toa Oil and Yamaguchi Refinery of Seibu Oil), is 445,000 barrels per day.
[151] Reszat, et al. 2002. Showa Shell had started to buy dollars forward at an average cost of ¥144.

liability, but also a dollar short-term deposit, plus the currency option would have been reflected in the income statement as a cash-flow cost.

Showa Shell was still exposed to oil price volatility, which could be eliminated using a forward oil contract; if the spot price for West Texas Intermediate crude oil traded at $21 per barrel on September 30, 1989, the company could hedge its monthly needs (15 million barrels) by purchasing crude oil forwards for the corresponding delivery date. On September 30, 1989, oil forwards were quoted at $20 per barrel and this allowed Showa Shell to lock in its December delivery purchase at $300 million. It does not seem that the oil risk was a major concern to Showa Shell, mainly due to the protection the company had on the long-term contracts or spot delivery by Royal Dutch Shell via its worldwide production.

Were they hedging or speculating?

Showa Shell could purchase 15 million barrels of oil at $20 per barrel for a total of $300 million at the forward rate of ¥145 per dollar and could consequently hedge a transaction exposure in the amount of $300 million per month. At any given point in time, Showa Shell should have an outstanding dollar exposure of no more than $900 million to hedge the cost of the oil imports. Showa Shell had position limits of $200 million per month, hence the company should have limited its overall dollar forward position to $600 million, which was far from the reported $6.4 billion outstanding balance and clearly indicated that $5.5 billion of the total outstanding balance was purely a speculative position and not part of the normal hedging[152]. Keeping this in mind; it seems plausible that Showa Shell currency traders were simply doubling up on their positions with the hope of

[152] Ipsen, Erik. *"Shell Gains Despite Currency Fiasco."* New York Times, February 26, 1993.

recouping their losses faster as soon as the dollar finally rebounded. The Showa Shell currency traders did not follow the market maxim *"cut your losses short and let your profits run"*[153], but were consumed by the *loss aversion bias*[154] by which traders consistently hold less to winning trades than to losing ones.

Concealing currency losses

Forward exchange contracts are cash settled at maturity. When Showa Shell entered the first 90-day forward dollar position on September 30, 1989, at the exchange rate of ¥145, it committed to taking delivery of $300 million and delivering ¥43.5 billion in exchange. Unfortunately, on December 30, the $300 million at the spot rate of ¥140 was now worth only ¥42 billion for a cash flow loss of ¥1.5 billion (about $10 million). Considering this, Showa Shell would have been better off not hedging and simply riding the appreciation of the yen. Settling the forward (and recording it as a loss, as a separate entry in the income statement) would have attracted the attention from senior management, the company's board of directors, bankers, and investors, yet Showa Shell could roll over the foreign exchange losses (at the initial forward rate of ¥145). The company exploited weaknesses in Japanese accounting rules and received the aid of the Japanese banks, which were counterparties in these contracts. These transactions never resulted in an exchange of money and, since forward contracts are reported as off-balance sheet items, simply became paper losses buried in the financial statement footnotes. To make matters worse,

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[153] This forex trading maxim has roots going back over a hundred and fifty years and pertains to trading in just about any financial market.

[154] Per D. Kahneman and A. Tversky, *"… people generally feel a stronger impulse to avoid losses than to acquire gains."* The implication for investors is simple, but it simply cannot be tolerated in financial decision making. Investors hold on to losing investments for too long and sell winners too early, in the fear that their profit will simply evaporate unless they sell. Tversky, Amos, Kahneman, Daniel. "*Loss Aversion in riskless choice: a reference-dependent model*." The Quarterly Journal of Economics, Volume 106, Issue 4, November, 1991.

Japanese banks did not insist on cash settlement from their good customers, agreeing instead to wait for a change in the trend of the foreign exchange losses, which never happened. Showa Shell currency traders continued rolling into new forward dollar contracts – still convinced the tides would turn (the dollar would rise rather than decline) – so their losses continued to mount month after month and were never settled. It was possible Showa Shell would not be able to write an immense check for ¥125 billion (or $1.07 billion), because the amount equaled five times Showa Shell's 1992 estimated profit[155]. Default on the forward contract was therefore a real possibility.

The story unfolds

As mentioned earlier, it was not until late 1992 when the massive position came to light, when one of Showa Shell's bankers mentioned it casually to one of the firm's senior executives[156]. At that time, the company's currency traders had already disclosed the massive position to two Treasury senior managers, but the matter was not brought to the attention of President Hemni until nine months later. The reasons can be attributed to the fact that the currency traders came to the company from the Shell side of Showa Shell Sekiyu K.K., which was created when it merged with Showa in 1985, and the managers to whom they disclosed the information were also alumni of the same organization. There was visible rivalry between groups and two different cultures, which exacerbated and lengthened the process of bringing the matter to the attention of senior managers. Showa Shell was not an isolated case, but one of several in Japan involving foreign exchange losses using forward contracts which were rolled over and not settled. On April 9, 1994,

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[155] UPI. *"Showa Shell cuts top executives over massive losses."* Feb. 25th, 1993. *http://www.upi.com/Archives/1993/02/25/Showa-Shell-cuts-top-executives-over-massive-losses/7312730616400.*

[156] *http://www.joc.com/showa-shell-officials-resign-over-foreign-exchange-losses_19930225.html*

Kashima Oil revealed $1.5 billion in foreign exchange losses, and Japan's Ministry of Finance soon banned the roll-over of "out-of-the-money" forward contracts.[157] As a consequence, offender firms such as Showa Shell and Kashima Oil were advised to liquidate forward contracts in short order, something they did between 1993 and 1995. Both companies had to liquidate significant real estate holdings, and common equity was issued to settle the huge cash-flow losses[158,159]. At the time of the events, Sir Peter Holmes, Shell's chairman, was said to have *"been shocked and disappointed by the currency dealings, which were in breach of company policy not to speculate on foreign exchange markets"*[160]. Shell sent Neil Gaskell, a senior financial manager of the pension fund investments at the energy company, to take over the responsibility as Showa's finance director and vice president. John Jennings, managing director of Royal Dutch Shell, said *"the losses would have bankrupted other companies. But Showa Shell has nonoil assets such as land which may be realized to meet these losses"*[161].

Lessons learned

There is ample evidence that indicates the procurement department in charge of oil purchases was not communicating with the currency traders and Treasury department to agree on the size of the company's oil bill that needed to be hedged. A timely coordination between these areas is crucial to an effective hedging strategy. Oil procurement and Treasury executives should be on the same page instead of working independently; Showa

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[157] *https://www.ukessays.com/essays/finance/a-summary-of-reviewed-case-studies-finance-essay.php.*

[158] https://www.researchgate.net/publication/256038719_Trading_Losses_A_Little_Perspective_on_a_Large_Problem, page 6

[159] Per Beate Reszat, *"the company wrote off these losses over the next few years and compensated by selling securities and property to raise the necessary cash".*

[160] http://www.independent.co.uk/news/business/heads-roll-at-showa-shell-1475354.html

[161] http://www.upi.com/Archives/1993/02/25/Showa-Shell-cuts-top-executives-over-massive-losses/7312730616400/

Shell's main exposure was limited to the dollar and oil, so it seems surprising that the exchange risk hedging was performed independently of the oil risk management portion.

Systematic audit is a given due to the complexity and volume going through a trading room. These audits play a key role complementing reporting. Audits should be both internal and external, always following the principles of independence between lines of defense and areas of the organization. The order tickets generated are the building block for an effective method to uncover rogue transactions or patterns, especially as they get recorded by the front and back offices. Constant channels of communication are key with counterparties – mainly trading rooms at banks – as in this case the rogue activities were uncovered through counterparties' comments on abnormal positions and strategies. We need to highlight the importance of management's willingness to act on signals of problems that have been identified.

As is the case with most trading rooms within banks and larger industrial conglomerates, Showa Shell claimed to have reporting guidelines in place with very tight position limits. In the case of Showa Shell, the position limits were $200 million, but this did not stop the rogues. Position limits are not enough. *"Marking-to-market"* of each outstanding forward contract is necessary; as their trading is not continuous, *"marking-to-market"* would require a detailed valuation at the close of every business day. At Showa Shell, ineffective controls allowed currency traders to roll over $6.4 billion of forward contracts, something that had no connection whatsoever with the company's role as an oil refiner and distributor.

Showa Shell was involved in sizable financial dealings, which should have been continuously reported – a detailed breakdown of all aggregated positions, by maturity and

tenor – and scrutinized by senior management outside of the Treasury department, including but not limited to the Board of Directors. For instance, at Japan's largest oil refiner (Nippon Oil), the Treasury's deputy manager of foreign exchange reports monthly the foreign exchange positions and associated hedging strategy to the company's Board of Directors[162] and other senior managers within the company.

[162] Jacque, Laurent L. "*Global Derivative Debacles: From Theory to Malpractice.*" World Scientific, 2015, pp. 313.

Daiwa

Background

The New York office of Daiwa opened in the 1950s and initially only dealt in US Government debt as a service to their pension fund clients. Daiwa became an important player in the US Government debt market and the company was designated as a primary dealer in 1986. Per the Federal Reserve Bank of New York, *"Primary dealers are trading counterparties of the New York Fed in its implementation of monetary policy. They are also expected to make markets for the New York Fed on behalf of its official accountholders as needed, and to bid on a pro-rata basis in all Treasury auctions at reasonably competitive prices."*[163]

Daiwa bank is headquartered in Osaka. It is one of eleven city banks and the only city bank authorized to operate a trust business. It was established in 1918 as the Osaka Nomura Bank, and its securities division later became the present Nomura Securities Co. (still Daiwa Bank's largest shareholder). It serves as the designated bank for the Osaka prefecture and it does not belong to any Japanese keiretsu or industrial group. As of 1994, Daiwa was one of Japan's top 10 banks and one of the top 20 banks in the world in terms of asset size.[164]

[163] https://www.newyorkfed.org/markets/primarydealer. *E*xpectations and requirements can be found in the same location.
[164] Nanto, D., Jackson, W. & Wells, F. "*The Daiwa Bank Problem: Background and Policy Issues."* November 30, 1995.

Toshihide Iguchi joined Daiwa's New York office in 1974 and by 1977 was running the custody department at the same location[165]. In 1984 he was promoted to the position of trader and began trading in US Government debt, yet he retained his back-office role and continued doing so until 1995. This lack of segregation was a relatively common practice of small trading desks in the early 1980s but frowned upon by the early 1990s.

On July 13, 1995, Iguchi (executive vice president) confessed in a letter to the president of his bank the loss of an estimated $1.1 billion by dealing in US Government debt. The original loss, incurred in 1984, of $200,000 remained hidden for an extraordinarily long period for such a loss to remain hidden. Per Iguchi's confession, in the period of controlling both front and back offices, he conducted more than 30,000 unauthorized transactions[166], which allowed him to cover up the loss by selling off securities owned by Daiwa and its customers. That original loss of $200,000 grew to over $1 billion in the eleven-year period.[167] The custody activities were conducted via a sub-custody account held at Bankers Trust; this account allowed the collection and disbursement of interest on the bonds, as bonds were sold or transferred following orders from a customer or the bank's own managers. All activities were tracked via transaction reports that Iguchi received. Iguchi sold securities and changed records when customers sold off securities that he had already sold (unauthorized) or when customers needed to be paid interest on the same securities in custody. Ultimately about $377 million of Daiwa's customers' bonds and about $733 million of Daiwa's own securities were sold by Iguchi

[165] Nanto, et al., 1995.
[166] TIME Magazine. *"I didn't set out to rob a Bank."* February 10, 1997, pp. 1.
[167] Asiaweek.com magazine. *"Anatomy of a Scam."* 1995, pp. 1.

to cover his trading losses.[168] Iguchi continued to try to trade his way back into the black, while Daiwa and its internal auditors failed to independently confirm the custody account statements.

Earlier the same year, Barings Bank was affected by a similar failure in risk management, but Daiwa's $200 billion of assets and $8 billion allowed it to survive the scandal. The real damage was triggered by Iguchi's cover-up over the years and by senior managers' cover-up between July 13 and September 18, 1995, when the bank reported the loss to the US Federal Reserve Board. Both led to criminal indictments against the bank and bank officers, and the scandal resulted in the bank being kicked out of US markets with significant damage to Daiwa's reputation. Daiwa was forced to change strategy and solely concentrate on its core business in Japan and Southeast Asia.

The role of management

During an interview with TIME Magazine while serving his sentence, Iguchi was asked his position about his actions, whether his actions felt like a crime. *"To me, it was only a violation of internal rules,"* he said. And he added: *"I think all traders have a tendency to fall into the same trap. You always have a way of recovering the loss. As long as that possibility is there, you either admit your loss and lose face and your job, or you wait a little – a month or two months, or however long it takes."* Iguchi confirmed that, before 1992, there were about six or seven cases of unauthorized trading at Daiwa Bank that led to losses ranging from $100 million to $300 million each, but there had been no

[168] USA v. Daiwa Bank 1995: pp. 7. *https://www.plainsite.org/dockets/2mc7l96lc/new-york-southern-district-court/usa-v-daiwa-bank-ltd/*

arrests or prosecutions.[169] The instruments traded by Iguchi were not derivatives[170] but plain vanilla bonds, and he was confident his superiors had the ability to completely understand exactly what he was doing. Iguchi's superiors were unwilling to see the situation as Iguchi's success grew to the point at which his desk produced half the New York office nominal profits.

Losses continued to accumulate, but it became more challenging after 1993 as Daiwa split the trading and back-office functions, yet he managed to survive two additional years. Over a period of nearly two months in mid-1995, Iguchi drafted five "confession letters" to Daiva's president, Akiri Fujita.

The first "confession letter" detailed that Iguchi, as an employee of the New York office of Daiwa Bank, caused losses for more than $1 billion from trading in United States Treasury bonds. Furthermore, Iguchi stated that he concealed his losses by selling Treasury bonds that the bank held as custodian; the owners of the US Treasury securities were entitled to routine coupon payments on their bonds from the Federal Treasury and, if they sold the US Treasury Obligations they owned or thought they owned, the market value of these securities. Iguchi not only confessed the losses he incurred, but also warned his managers about the possibility of detection by the US authorities and assured them of an investigation if he was not available to answer questions. Iguchi laid special emphasis on the massive consequences for the bank if the matter became public, arguing that it needed to be handled internally by Daiwa and the Japanese authorities.

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[169] TIME, et al., 1997.

[170] Per Asiaweek (Asiaweek.com 1995: pp. 1), a report existed claiming that Iguchi was dealing in derivatives per Daiwa's management.

Iguchi provided his superiors with a detailed plan to solve this problem. First, he needed to remain a key participant to ensure the unauthorized trades remained undetected over the short term. A permanent solution was also offered, which included replacing the securities to avoid the loss from appearing on the books of Daiwa's New York office to avoid detection by the US authorities.[171] In a second letter, Iguchi guaranteed the President of Daiwa that there was no possibility of detection by the US authorities if Daiwa bought back the missing securities.

On July 24, 1995, Iguchi was contacted by three Daiwa officials to discuss the two letters that he had recently sent. The group included the Deputy President of Daiwa, one of the Managing Directors of Daiwa, and the General Manager for the International Treasury Division. During this conversation, Iguchi was asked for his continued engagement and some practical suggestions on how to continue concealing the loss from detection by the US authorities. The meeting triggered a third letter, dated July 25, 1995, now addressed to the Deputy President of Daiwa, who appeared to be overseeing this matter. Iguchi warned against any amendments to the trading books of Daiwa New York as this would be an offense under the jurisdiction of the US authorities. This suggestion clearly confirmed Iguchi's position about replacing the missing securities. The Managing Director arranged for a meeting that took place on July 28, 1995, at the Park Lane Hotel in New York. In attendance were the same participants from the previous meeting. The Managing Director disclosed that Daiwa intended to announce the loss in late November, after the release of

[171] During September 1995, Iguchi pretended to be on vacation so a scheduled audit would be delayed. He remained in town working with a Daiwa manager helping to reconstruct the trading history of this department.

half-yearly results on September 30. Iguchi was offered to transfer to an affiliate of Daiwa in Japan.

The Managing Director approved Iguchi's request to continue selling the necessary securities to ensure no interruptions happened to the payments to clients. Iguchi was also instructed to do everything in his power to continue concealing the $1.1 billion loss and requested an additional letter containing all the details related to the loss.[172]

An additional meeting was scheduled, at the same location, for July 29, 1995. Iguchi wrote an additional letter that contained a detailed account of the reasons for the initial losses and how he disguised them through the unauthorized sale of securities belonging to clients, in addition to Daiwa's securities, and the entry of false information into the trading books of Daiwa's New York office. The letter contained extensive detail on how Iguchi falsified the Bankers Trust accounts statement that reflected the actual holdings of United States Treasury securities held on custody for Daiwa and its clients, and provided the original account statements to his managers. These records showed the extent of the losses. Iguchi was instructed to destroy the computer disk containing the confession letter. Around August 4, 1995, Iguchi's manager instructed him to draft an undated confession letter—this would be the fifth one–containing details about his own fraud, unauthorized activities, and losses. He was clearly instructed not to disclose any details to anyone outside of the group.

Daiwa's management disclosed the situation to the authorities by providing a copy of the last letter. On August 8, 1995, the President of Daiwa informed Yoshimasa Nishimura, the Banking Bureau Chief of the Japanese Ministry of Finance; and on

[172] USA v. Daiwa Bank 1995: pp. 9.

September 18, the matter was revealed to the Japanese regulators and the Federal Reserve Bank of New York[173]. The US Congress report comments that "it does not appear that Iguchi or other bank officers gained financially through the losses and subsequent actions (other than keeping their jobs)"[174]. Per Iguchi, he was not informed of this last decision,[175] and he was arrested by the US authorities on September 23, 1995.

Role regulators played in the fiasco

Iguchi had several specifics to share about the regulators' responsibility in this debacle on both sides of the Pacific Ocean. An inspection by the US Federal Reserve Bank that was scheduled to last two days only lasted about 15 minutes. Per Iguchi, the inspectors smelled strongly of alcohol[176]. Iguchi also believed the US authorities suspected Daiwa misbehavior since about 1993, yet Daiwa successfully deflected detection by concealing the existence of a trading room in New York by filling this trading room with cardboard boxes. The failure was not solely limited to the US. In 1994, an inspection in the same location, conducted by inspectors from the Japanese Ministry of Finance, only lasted a day instead of the full week. One report prepared for the US Congress commented, *"The Ministry (of Finance) kept the knowledge from U.S. regulators for more than a month and has maintained a system of bank surveillance that many point out relies too much on trust and close personal ties"*[177]. Iguchi indicated the inspectors were interested in spending more time in Las Vegas.

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[173] Kane, Edward. *"Breakdown of accounting controls at Barings and Daiwa: Benefits of using opportunity-cost measures for trading activity."* Pacific-Basin Finance Journal, 1999, vol. 7, issue 3-4, pp. 203-228.
[174] Nanto, et al., 1995.
[175] TIME, et al., 1997.
[176] Kattoulas, V. *"Daiwa Bond Trader Has His Say."* International Herald Tribune, January 8th, 1997, pp. 1.
[177] Nanto, et al., 1995.

Company Culture and drivers to Iguchi

Several regulators, including the Federal Deposit Insurance Corporation (FDIC), the Board of Governors, the Federal Reserve Bank of New York, and the New York State Banking Department, jointly issued "cease and desist" orders against Daiwa Bank and the Daiwa Trust Company. The orders limited the activities of both entities in the US, in addition to an independent forensic investigation. The independent company needed to perform an exhaustive review and testing of internal controls and risk management procedures.

On November 2, 1995, US authorities instructed Daiwa to liquidate operations by February of the following year.[178] Daiwa also had to face indictments on 24 charges that included *"conspiracy, mail and wire fraud, obstructing the examination of a financial institution, falsification of bank records, failure to report felonies, and the affirmative concealment of felonies"*. On February 28, 1996, Daiwa pleaded guilty to these charges and was finally sentenced to a fine of $340 million. Judge Lewis A. Kaplan, who handled the case, added this: *"Daiwa has manifested extraordinary culpability both with respect to [Iguchi's] scheme, … and otherwise … Daiwa bank has acted with exceptional contempt of US law and US regulatory authority. It has refused to cooperate with US authorities to this date. It has little claim on the sympathies of an American court."*[179]

Masahiro Tsuda, Iguchi's general manager, was also indicted, arrested, and charged with *"conspiracy to deceive the Federal Reserve by concealing the bank's $1.1 billion trading loss, making false statements to the Federal Reserve, making false entries in the*

[178] Kane, et al., 1999.
[179] Kane, et al., 1999.

books and records of Daiwa, and the misprision of a felony". On April 6, 1996, Tsuda pleaded guilty to one count of conspiracy. In October, he was sentenced to two months in prison and a fine of $100,000.[180]

A report prepared for the US Congress, titled *The Daiwa Bank Problem: Background and Policy Issues,*[181] was released on November 30, 1995. The report indicated that Daiwa officials, including Iguchi, were involved in a series of maneuvers, dating back to 1989, to delude officers of the New York State Banking Department who were conducting an inspection at that time. The actions included, but were not limited to, relocating back office staff and traders[182]; these actions had also been deployed in 1992 to mislead examiners of the Federal Reserve Bank of New York, which was the first examination of Daiwa's New York office after the enactment of the Foreign Bank Supervision Enhancement Act of 1991[183]. When the examiners became aware that Iguchi ran both the trading desk and custody services, the matter was brought to the attention of Daiwa's management.

Daiwa promptly provided the examiners and officers with written confirmation that both functions had been split a few months before. In November 1993, both the New York Federal Reserve and the State Banking Department issued an Action Letter in which both warned Daiwa about audit deficiencies in the accounting records at the New York office and, once again, to the relocation of traders.[184]

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[180] Kane, et al., 1999.
[181] Authored by Dick K. Nanto, William D. Jackson, and F. Jean Wells.
[182] Nanto, Dick K.; Jackson, William D. & Wells, F. Jean. *"The Daiwa Bank Problems: Background and Policy Issues."* November 30th, 1995, pp. 4.
[183] Nanto, et al., 1995. The focus of the Foreign Bank Supervision Enhancement Act of 1991 is to ensure foreign banks meet the United States capital and management standard and are adequately supervised. *https://www.fdic.gov/regulations/laws/rules/8000-2500.html.*
[184] Nanto, et al., 1995.

After the first confession letter, on July 17, 1995, a false report was filed with the Federal Reserve to prevent detection of Iguchi's indiscretions. The Japanese Ministry of Finance was notified on August 8, 1995, but the New York Federal Reserve Bank was not advised until September 18, 1995[185]. The Japanese banking crisis was in full swing and an estimated $400 billion of non-performing loans was hampering the Japanese banking industry. One of the main sources of the accumulation of bad debts was the bad accounting practices of the Japanese banks, as they did not adjust downward the market value of properties, even if the properties had become insignificant. On September 8, 1995, Daiwa's American legal counsel, Sullivan & Cromwell in New York, advised the bank to inform the New York Federal Reserve and other banking authorities immediately.

Ten days later, on September 18, 1995, Daiwa advised the New York Federal Reserve about Iguchi's trading losses. The U.S. District Attorney was immediately alerted, and Iguchi was arrested on September 24. The losses were made public on September 26, and Iguchi was charged with fraud on September 27. He pleaded guilty.

Also on September 24, 1995, US officials became aware of additional losses of $100 million that occurred between 1984 and 1987 and that were executed via a Cayman Island subsidiary. The losses emanated from unauthorized trading by Daiwa staff.

Iguchi provided additional details in an interview with Time Magazine[186] that can shed some light about his motives. Iguchi tried to recover the initial loss via an authorized and legitimate transaction. The admission of a loss, he felt, could make him lose his credibility and possibly his job. He was confident he would be able to recoup the loss and

[185] Asiaweek.com, et al., 1995.
[186] Time, et al., 1997.

that all would be well. From his own words, it is clear his status, self-worth, and security depended on his ability to make substantial sums of money. Moreover, he felt responsible for his team, and he felt -at worst- he was in violation of a minor number of internal rules. Being responsible for about half the profits of the New York office created a cognitive gap for those that were supposed to supervise him. Previous mishaps committed by other team members (in the range of $100-300 million) only strengthened his belief that he was on the right path. Most surprisingly, even though he became aware in 1993 that making a false statement to a Federal examiner was a crime, he was still convinced his unauthorized activities were not criminal actions.

By January 1996, Daiwa was thought to be in the process of merging with Sumitomo. Daiwa agreed to sell most of its assets in the US, for about $3.3 billion, to Sumitomo and sell off its 15 offices across the US. This was a clear signal from US regulators for any foreign institution about concealing losses as it carries the threat of "significantly damaging" the integrity of the US financial system.[187]

Lessons from the Daiwa debacle

After analyzing the Daiwa series of event, it is clear the culture of the company set the tone from the top to all employees. The young Iguchi absorbed many elements from early in his career and learned to operate in that environment. It is no less troubling to learn that other traders' unauthorized activities were proactively covered up by management. The company management had numerous warning signals about weaknesses in the risk management framework, but decided to leave the matter to local management; ultimately, senior management was impacted even years after the event, as it was shown they acted

[187] Nanto, et al, 1995.

ineptly. Iguchi's dual role and his very good understanding of how the company operated allowed him to remain undetected for a very long time. Both this case and the Barings case (to be discussed next) indicate the need to segregate the record keeping (back office) and risk assessment (internal controls) functions from the risk-taking ones (front office). In an environment of lax to no controls, massive fraud (like this one) can span several years – the Daiwa situation was clearly allowed to happen and prosper due to the lack of effective risk management and internal controls testing. Moreover, the evidence suggesting the main Japanese regulator, the Ministry of Finance, helped Daiwa in remaining undetected speaks of potentially deeper problems, not limited to Daiwa itself.

Barings plc

Background

Barings Bank was, until its collapse in 1995, one of Britain's most illustrious corporate and investment banks. The bank counted among its clients Queen Elizabeth II and other members of the royal family. It was Great Britain's oldest bank, with a 200-year history which included financing of Britain's war against Napoleon, the United States purchase of the Louisiana colony from France in 1803[188], and the U.S. construction of the Erie Canal in the early 1800's. Founded by Francis and John Baring on Christmas Day, 1762, the company began operations on New Year's Day 1763, with offices in London and Exeter, England. By 1774, the bank was conducting business in the U.S., and by 1818, the Duc de Richelieu declared it to be "the sixth great European power," after England, France, Prussia, Austria, and Russia.[189]

Despite this glorious history, Barings was a relatively small corporate & investment bank, and struggled in the 1980's to compete against the larger commercial banks in the U.K. that had begun to penetrate the investment banking arena. However, it continued to rank among the nation's most prestigious institutions. Even some foreign banks like Citibank and Deutsche Bank were increasing market share in a market formerly dominated by Barings, and Barings felt the need to expand its capital base and, consequently, its

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[188] *"At the time this was the largest financial transaction of its day, the $15 million deal doubled the geographical size of the nation and became one of the most historically significant trades of all time*." Aguilera, Kristin. "*The British Bank That Forever Altered the U.S. Economy."* Bloomberg. January 22, 2013. *https://origin-www.bloombergview.com/articles/2013-01-22/the-british-bank-that-forever-altered-the-u-s-economy.*

[189] Aguilera, et al., 2013.

capabilities and market reach. This expansion included the purchase in 1984 of the U.K. stock brokerage Henderson Crosthwaite, allowing Barings to enter the securities trading and brokerage business.

Due to the lack of knowledge in this industry, Barings management allowed the existing management of Henderson Crosthwaite to manage the securities subsidiary on their own, organizing the company as a subsidiary of Barings Plc, rebranding it as Baring Securities Ltd. (BSL). The more traditional corporate & investment banking business was housed in Baring Brothers & Co., Ltd. (BB&Co.). Both BSL and BB&Co. in addition to an asset management subsidiary reported to a holding company, Barings Plc., which was chaired by Sir Peter Baring.

BSL was the international financial arm of the Barings group and had three subsidiaries: Baring Securities (London) Ltd. (BSLL), Baring Securities (Japan) Ltd. (BSJ) and Baring Securities (Singapore) Ltd. (BSS).

In 1993 Barings reorganized their corporate structure. BSL no longer reported directly to the holding company, but instead to BB&Co., which continued to report up to Barings Plc. This reorganization reflected some of the difficulties Barings was having in bridging corporate cultures between the long-standing Barings corporate and investment bank management, and the brokerage and trading of Henderson Crosthwaite. To regain order, the securities business housed in BSL was no longer independent from the corporate and investment bank, but instead reported directly.

The aim of this reorganization was not intended to solve all issues instantly; cultural differences can take several years and significant financial cost to work out in a merger. Most of the management of BB&Co., for instance, had no significant experience with the

brokerage and trading business and could not fully comprehend the issues reported by BSL. Despite the reorganization, BSL management still had a great deal of independence and communications remained very poor.

In 1993, an additional set of organizational changes were introduced at Barings which included the introduction of a matrix approach to management, requiring managers and employees to have two reporting chains of command. One reporting chain was based on operations, while the other was based on products; for example, a BSL employee was required to report to one manager for systems, settlement, accounting, and related operational issues, and to another manager altogether for product issues. Employees often complained about the lack of clarity in times of decisions or if an issue overlapped operational concerns and products.

By 1994, Barings added an additional layer to its management structure with the introduction of a risk management function. Risk managers were established in London (at BSLL) and in Tokyo (at BSJ), but none in the Singapore office.

Baring Securities (Singapore) Ltd. (BSS)

Following the merger of Barings with Henderson Crosthwaite, a presence in Singapore was established in 1987. Initially, the office was primarily involved in equities trading and brokerage, but progressively the office engaged in frequent trading on the new futures exchange in Singapore, SIMEX (Singapore Mercantile Exchange)[190].

BSS did not have a seat on SIMEX, and to reduce commissions costs on all its transactions it purchased a seat under a new subsidiary of BSS called Baring Futures Singapore (BFS).

[190] Intercontinental Exchange Group (ICE) acquired the Singapore Mercantile Exchange in 2014.

Barings then needed to hire a manager, traders, and operations staff to manage this new futures platform. Barings hired an operations manager to run BFS daily – Nicholas Leeson. Nick Leeson's first job at Barings was as a clerk, but he rose swiftly.[191] Leeson had worked briefly at Morgan Stanley in the operations department before joining Barings. He had established a good reputation at Barings while working at their back office in Jakarta by sorting through $170 million (£100 million) in stock certificates and bearer bonds that had to be put in deliverable form to be sent to clients. The Indonesia office had a significant number of unreconciled trades because the trading volume had grown so fast that the processes in place for delivering stock certificates could not keep up with the volume.[192] Barings' internal guidelines established a process by which discrepancies were posted to a special account, called the "88888 Account." Hence, the bank's books would balance, discrepancies would be isolated and dealt with separately, and the bank could make its regulatory filings without any delays. Ultimately, the bank aimed to record these discrepancies and close them out within a day, but Leeson realized that Barings' internal guidelines were not consistently followed.

Leeson was transferred to the Singapore office in 1992 to start up the BFS business. Upon arrival, he immediately began hiring the operations staff and traders needed to conduct futures trading; since Leeson had no experience in the futures trading business or trading in general, he took and passed the required exams to trade on SIMEX. Generally, the functions of trading and settlements (back office) are kept separate and distinct within an organization, because the head of settlements is expected to provide an independent confirmation of records of trading activity, but Leeson was never relieved of his authority

[191] Xu, Yan, "*Barings Case."* FINA0301/2322 Derivatives, Hong Kong University, 2016.
[192] Xu, et al., 2016

over the subsidiary's back-office operations when his responsibilities were expanded to include trading.[193]

Given that BFS's primary business was arbitrage of Nikkei 225 futures traded on SIMEX and on Japan's Osaka Stock Exchange (OSE), Barings management did not expect to run any significant market risks. These derivatives were identical contracts on the Nikkei 225 index, but prices could be somewhat different from minute to minute; the arbitrage function was intended to buy contracts on one exchange and almost instantly sell the same size of contracts on the other exchange. BFS could pocket the difference in profit. Arbitrage operations work on very small margins of profit but massive volumes to make enough profit to cover expenses. Arbitrage does not expose the bank to market risk (the risk of changes in prices), if executed properly and both sides of the transaction are executed nearly simultaneously. Operational issues can be important given the volumes involved, but Barings felt Leeson was the right professional for this job. Leeson had operational experience, yet his lack of market experience was not as important given that the perceived market risk was very small in this business.

An additional mandate given to BFS was to execute futures transactions for other companies in the Barings group, with the biggest customer expected to be BSJ[194]. BSJ had lost a few of its largest institutional clients in Japan when operations were established directly in Singapore, and BSJ attempted to offset this lost income by undertaking proprietary trading in its own name. BSJ began to channel both its remaining customer business and its own proprietary trading on SIMEX to BFS in Singapore. In this role, BFS

[193] Kuprianov, Anatoli. *"Derivatives Debacles – Case Studies of Large Losses in Derivatives Markets."* Federal Reserve Bank of Richmond Economic Quarterly Volume 81/4 Fall 1995, pp. 21.
[194] Baring Securities (Japan) Ltd.

could also purchase options for clients if the risk was immediately offset, but could never purchase or sell options for its own account, as this would directly expose BFS to market risk.

When handling customer orders via SIMEX, Leeson had the option of covering his market risk on SIMEX by executing the offsetting BFS trade on either the OSE (Osaka Securities Exchange) in Osaka or SIMEX. Leeson quickly developed the practice of *"switching"* trades for customers, by which he would execute a SIMEX transaction for the customer at a specific price, but not actually purchase the offsetting trade on the SIMEX if he could find a better price on the OSE. This may sound not fully transparent, but there was nothing unethical about this practice – customers received the desired SIMEX contracts they purchased, and more generally than not customers are not made aware of how a bank hedges its exposure (if it does hedge at all). Still, switching was a very different activity than arbitrage. This exposed BFS to intraday market risk, given that Leeson could wait hours or even until the end of the day to buy the proper offsetting trade for BFS. Lesson's chain of command and Barings head office in London understood switching to mean arbitrage.

Both futures arbitrage and trade execution for clients were the activities under Leeson's authority, so he had two reporting relationships for product purposes – to Ron Baker, head of derivatives at BSS, and to Michael Killian, head of Global Futures and Options Sales. Moreover, he had reporting responsibility for operational function purposes to James Bax, head of Barings' Singapore office, and to Simon Jones, Regional Operations Manager for Barings in South East Asia.

Unauthorized Trading

In 1992, shortly after arriving as manager of BFS, Leeson averted an operational error caused by one of his traders with a potential $34,000 (£20,000) loss.[195] Operational errors tend to be booked into a separate account from trading income and losses. Leeson instructed the back office to create an account for this purpose, account 88888 (the number 8 is considered extremely lucky in Chinese societies)[196]. He then attempted to recover this loss by entering into outright futures and options contracts on the SIMEX, booking these transactions into this account. Leeson's initial attempt at trading was profitable, he could successfully turn the operational loss into a trading gain, but he still faced the problem of reporting unauthorized trading to his management. To overcome this difficulty, Leeson instructed the BFS IT consultant Edmund Wong to modify the daily reports, which were forwarded electronically to London, and remove account 88888. This change was completed on July 8, 1992, and remained completely undetected until the collapse of Barings on February 27, 1995. Interestingly, position reports showed no hint of any of Leeson's actual trading, yet reports on margin requirements for SIMEX sent to London did include the balances in account 88888.

Faced with a significant series of trader errors, Leeson remained confident of his trading skills and continued to enter into open futures and options positions on SIMEX, allowing him to be in long positions on the Nikkei 225 index, and booking the transactions in the 88888 account. He expanded his trading by entering into short positions on Japanese interest rates, using the Japan Government Bond (JBG) futures contract. Unfortunately for

[195] This account is based on the findings of a report by the Board of Banking Supervision of the Bank of England (1995) and on many press accounts dealing with the episode. Except where otherwise noted, all information on this episode was taken from the Board of Banking Supervision's published inquiry.
[196] *http://www.chinatravel.com/facts/chinese-lucky-numbers.htm.*

Leeson (and later Barings itself), his trading senses were incorrect. By the end of 1992, he had already accumulated losses of $3.4 million (£2 million), and his cumulative losses by the end of 1993 reached $39.1 million (£23 million).

Leeson utilized a practice on futures exchanges known as *cross-trading*[197]. This allowed him to better disguise losses accumulated in account 88888. Leeson became a persistent user of the cross-trade function, concentrating his cross trades at the very end of daily trading on the SIMEX, when members were not inclined to take any additional positions on either side of the transaction. His counterparties for cross trades were Barings group subsidiaries, such as BSJ or BSLL. In effect, Barings was trading with itself, with the net result that it held open positions on the SIMEX, with direct exposure to market risk.

At the end of each day, when trading finished Leeson would instruct the back office to divide the cross trades into several different trades, executed at different prices and times during the day. This procedure gave the appearance to the Barings subsidiaries that Leeson was engaged in legitimate arbitrage or switching activity throughout the day. This complex cadre of steps -readjusting prices, contract sizes, and timing of trades- allowed Leeson to book profits in his trading accounts, and reserve losses in his 88888 account.

[197] An exchange member may be both a buyer and seller simultaneously if he happens to have matching buy and sell orders from two different customers. The exchange member must first offer up the transactions to all other members three times, and if no other member is interested in taking on either of the trades, the exchange member can book both trades simultaneously at the market price at the time.

Management Involvement

As Leeson significantly increased his unauthorized trading in 1993 and 1994, his results attracted scrutiny from the Barings management in London. In 1993, his trading results showed a profit of $15 million (£8.8 million), and in 1994 he reported a profit of $48.5 million (£28.5 million) while his real cumulative loss by the end of 1994 was $353.6 million (£208 million), all hidden in the 88888 account. London management was convinced Leeson was a *"turbo-arbitrageur"* capable of working miracles, as his profit in 1994 alone accounted for almost half of Barings Plc entire earnings, and in 1994 he was awarded a bonus of $850,000 (£500,000). Because his duties included supervision of both trading and settlements for the Singapore subsidiary, Leeson was able to manufacture fictitious reports concerning his trading activities.[198]

Both Leeson personally and BFS were developing a reputation in the market as a major player in the futures business, but some traders wondered how BFS could be making substantial and sustained income from a low margin business such as arbitrage.

To verify the activities at BFS, London management sent an audit team to Singapore to review futures trading activity. In August 1994, the auditor's report stated that combining the dual responsibilities of front and back office in Leeson's job was *"an excessive concentration of powers"*[199] which could lead to an abuse of control by Leeson. The auditors recommended that Leeson should no longer supervise the back office, have authority to reconcile SIMEX transactions with bank transactions, or have check signing authority. Simon Jones, regional operations manager of South East Asia, assured the audit

[198] Kuprianov, et al., 1995
[199] Sunday Times, March 5, 1995, pp. 12.

team that Leeson would *"with immediate effect cease to perform these functions,"* yet this recommendation was never implemented.

SIMEX noticed Leeson's trading patterns as well, mostly since it had on its records the actual trades booked in the error account, despite the fact it did not know that these trades were not being reported to Barings management. Since Leeson was incurring significant losses on SIMEX positions rather than the profits assumed by Barings' management, SIMEX required daily margin adjustments equal to the losses. As SIMEX rules did not allow exchange members to fund margin requirements of their customers, BFS had margin requirements for its customers, so it was responsible for obtaining such margin from these customers directly. As losses booked into the 88888 account grew, Leeson was faced with the challenge of obtaining an increasing amount of funds to meet margin calls.

Funding Margin Calls

Leeson had several options to finance the maintenance of the margin, but the primary method was to approach the Treasury Group at BSL in London for what he called "top-up" balances. Leeson extensively argued to Treasury Group that the main driver for margin requirements growth was his significant success in arbitrage and the switching activity was logically going to involve large volume on the exchange and consequently large margin requirements, and, in addition, the majority of the margin was needed on behalf of clients of BFS who were operating in other time zones (outside of Asia) and could not effectively meet margin requirements in Asia. Thus, Leeson was asking the Treasury Group to lend money -short term- to his clients in order to cover their margin obligations. For many types of financial transactions and banking operations, there are temporary

imbalances. Cash management systems often allow intra-day overdrafts, and these overdrafts can be large. For instance, a client may send out wire transfers every morning and receive incoming wire transfers every afternoon or may make transfers from different time zones. Every cash management account is supposed to balance at the end of the business day, and if a customer's account shows an overdraft, the amount is supposed to be less than the customer's credit limit.[200]

The Treasury Group approved these requests, and solely in 1994 about $255 million (£150 million) was advanced daily; soon after, the required amount to cover margin at SIMEX climbed to over $510 million (£300 million). The Settlement Department within the Treasury Group at the London headquarters had difficulty understanding which portion of the margin posted was for arbitrage and switching activity and which was for client trading; in 1994, the head of this unit complained to her manager that both BFS and Nick Leeson were frequently slow in answering her inquiries, if any answer was received at all. As the majority of these amounts were believed to be advances to clients, they were directly reported to Barings' Credit Committee in London. Additional reports to the Credit Committee disclosed that the majority of clients listed by BFS were Barings group companies such as BSJ, along with one outside client, the Banque Nationale de Paris (BNP) Tokyo office.

Baring's Asset and Liability Committee (ALCO) also reviewed the growing margin requirements of BFS, yet they were satisfied that there was no market risk involved since BFS was engaging in arbitrage and all positions were hedged. However, in 1994, as a

[200] Xu, et al., 2016

safeguard ALCO ordered BFS to reduce its arbitrage and switching activity; in 1995, Leeson clearly ignored this command and sharply increased his activities.

Options Sales

Given the increase in funding requirements, Leeson devised an additional method to raise funds. He began to sell options, which generated premium income for BFS. These were also hidden in account 88888. By definition, an option seller earns a premium from the buyer, but the premium *is the maximum amount of profit* that can be achieved on an option sale and it can only be achieved if the option expires "*out of the money"* (unexercised). However, if the option is "*in the money"* at maturity, the seller loses money, and the *losses can be* not just substantial but *theoretically unlimited*. That is why only the most experienced traders are authorized to sell options, and Leeson did not have clearance from Barings.

Leeson earned millions of dollars in premium, which helped him to meet the margin requirements, by selling both puts and calls on the Nikkei 225 index. The specific structure utilized was in the form of an option "straddle," which is a technique that traders use to benefit from what they expect to be a stable market during the life of the options. In his case, the straddle was priced between a Nikkei at 18,500 to 20,000; as long as the Nikkei traded in this range (on maturity of the options) Leeson expected to be able to keep the millions of dollars in premium received up front from the sale. Alternatively, if the Nikkei index traded outside of this range at maturity, Leeson either had to purchase the Nikkei at a higher price, or sell it at a lower price, to meet his option delivery requirement. In other words, if the index traded outside of this price range, Leeson would incur in a loss.

During 1994 and early 1995, Leeson sold over 37,000 contracts, which represented about $3.6 billion of face value and a substantial portion of the overall open interest[201] in these options. Such a sizable position was necessary to generate the amounts of premium needed to meet the margin requirements on his other positions on SIMEX. Asian stock markets began to cool down in 1994 and Leeson concentrated his trading on Japanese stock index futures and Japanese government bond futures. His strategy consisted of betting that Japanese stocks and interest rates would rise at precisely the time the Japanese market was sinking. Share prices and interest rates plummeted and continued to plummet. Leeson, instead of selling to neutralize his position, viewed every dip in the Nikkei average as a buying opportunity. Thus, all his losses piled up in the 88888 account. To recoup his losses, Leeson initiated the lethal strategy of *doubling*, which required him to double his bets each time he lost. Doubling is a do-or-die strategy that required Leeson to multiply the size of his bets in the 88888 account to recoup the losses amassed to date.[202]

By January 1, 1995, Leeson was short 37,925 Nikkei calls and 32,967 Nikkei puts. He also held a long position of just over 1,000 contracts in Nikkei stock index futures, which would gain in value if the stock market were to rise.[203] On January 17, 1995, a massive earthquake devastated the Japanese city of Kobe, and the Nikkei 225 traded sharply lower, losing over 1,500 points (Figure 6), very close to the lower range of Leeson's straddle positions. Leeson placed a side bet on Japanese interest rates, selling Japanese government bond futures by the thousands in the expectation of rising interest rates, he also

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[201] *Open interest* is the number of contracts or commitments outstanding in futures and options that are trading on an official exchange as any one time.
https://www.google.com/?safe=active&ssui=on#safe=active&q=open+interest.
[202] Xu, et al., 2016. Statisticians also call this strategy the *gambler's ruin*.
[203] Kuprianov, et al., 1995

tried to manipulate the index by buying enormous amounts of Nikkei 225 futures (Figure 7). This action briefly supported the market, but eventually his option positions incurred a substantial loss, along with the rest of his positions in the 88888 account.[204]

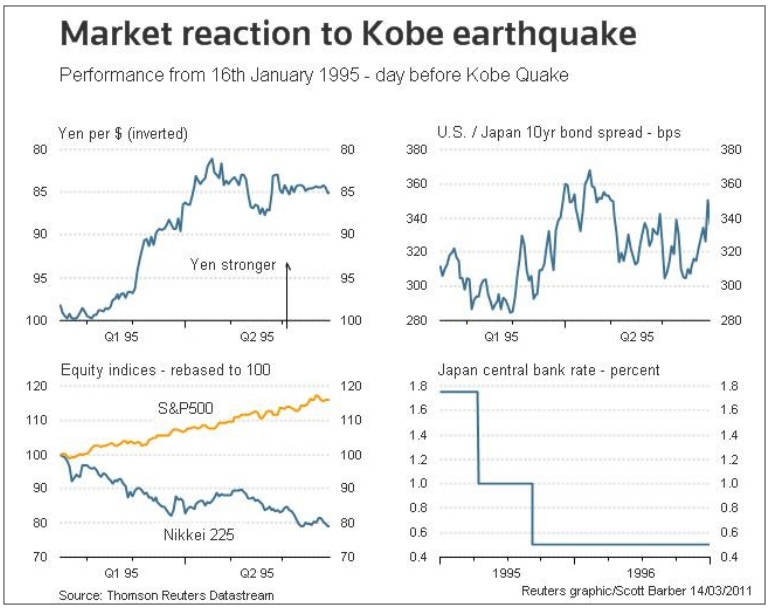

Figure 6: Market reaction to Kobe earthquake

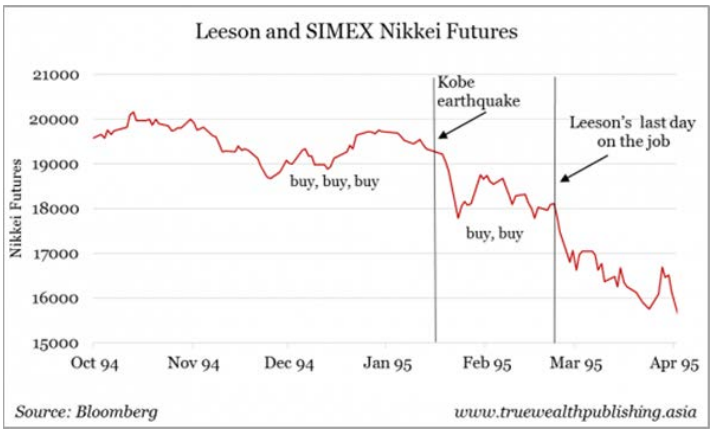

Figure 7: Leeson and SIMEX Nikkei Futures

[204] Kuprianov, et al., 1995

The Collapse of Barings

During 1994, SIMEX insisted on questioning the size of the margin payments and the ability of Barings London to continue meeting these requirements via letters to Barings Singapore. For instance, in one of its letters SIMEX alleged that BFS was in violation of exchange rules. BSS followed procedure and sent these letters on to Leeson for review and response.

In January 1995, Barings London also received a letter from the Bank for International Settlements (BIS) asking about the size of its trading activity in its Singapore office. By then, the market knew that BFS was the biggest player in Nikkei 225 futures, because positions were disclosed for each member. Nevertheless, the market did not know the net position BFS had, and as far as BFS management knew, the net position was close to zero. Barings senior management in London insisted to the BIS that all was in order.

Senior management of Barings Plc also notified the Bank of England that the corporation was by the end of 1994 in violation of the 25% rule, which was the limit of its capital a UK bank could post overseas for margin. After meeting with the senior management of Barings, the Bank of England accepted their justification for the necessity of this exception and informally allowed it to continue over this limit.

At the end of 1994, a more significant threat concerned Leeson: the opinion expressed by the external auditors Coopers and Lybrand (C&L) over certain discrepancies in the margin account. C&L could not understand a specific discrepancy of $78 million (¥7.8 billion) associated with margin payments to SIMEX and the OSE; in fact, this amount represented real margin requirements that Leeson was finding increasingly difficult to meet. Leeson conceived a story about an error in settlements with a third-party client that

would soon be covered when the correspondent bank –Citibank– made the payment to BFS. He suggested the root cause for the error was some over-the-counter trading BFS had entered with the third-party client. Soon thereafter C&L requested proof from Citibank about the coming payment. Leeson put together a forged response on Citibank stationery and promptly faxed it to BFS from his home. C&L was satisfied by this confirmation and later issued an unqualified audit for all of Barings Plc in 1994. Nevertheless, several senior leaders in London, including the head of the Credit Committee, complained to management in Singapore about the two-month delay on the sizable loan from a client they had never heard of before. Singapore management was prompt to reprimand Leeson for conducting unauthorized trading.

Leeson's market intervention was so extensive -many option straddles- that prices had fallen to the point where any further sales would generate very little (if any) in premium income. Significant margin obligations loomed on the horizon -both large margin needs and a large year-end loss- because management was getting more anxious about his activities. Leeson decided to *"double"* his position, trying recoup his losses in a last single effort. By late January 1995 account 88888 was holding (futures) positions on the JGB (10-year Japanese Government Bond) and the Nikkei 225 equaling $27 billion in notional value, while Leeson's straddle positions totaled $6.7 billion notional. All these positions constituted more than half of the total open interest in each contract. Additionally, the Treasury Group posted $833 million (£490 million) to SIMEX. Now the press, in addition to BFS competitors, were questioning Barings about the significant size of its positions. Leeson conceded he was operating for a large speculator in the market, but eventually the market turned against him, and his losses in the 88888 account reached unmanageable

proportions in excess of $1.0 billion. Leeson began to consider his options, which included fleeing the country.

In February 1995, Barings' Group Treasurer Tony Hawes flew to Singapore accompanied by Tony Railton, a settlement clerk from the London office, to personally reconcile the margin requirement and determine the portions devoted to client trading as opposed to arbitrage activity. During his visit, Hawes met with SIMEX officials who expressed concerns about Barings' massive positions. Hawes assured them the firm was fully aware of these positions and was ready to meet its obligations – he made these assurances based on the belief the exposure was being hedged by offsetting positions on the Osaka exchange. Within days, the clerk concluded that the margin requirements made no sense and did not reconcile to any known positions of BFS ($190 million discrepancy). Railton attempted to meet several times with Leeson to clarify but Leeson declined and even walked away from one of the meetings. A more thorough review revealed the presence of account 88888 and the true net position of Barings represented a loss of $1.4 billion (£827 million, Figure 13). Sir Peter Baring, the bank's chairman, did not learn of the bank's difficulties until the next day, when he was forced to call the Bank of England to ask for assistance. Ironically, this was the same day that Barings was to inform its staff of their bonuses. Leeson was to receive a £450,000 bonus, up from £130,000 the previous year, on the strength of his reported profits. Baring himself expected to receive £1 million.[205]

By February 23, Leeson had amassed a significant position of 61,000 Nikkei futures contracts, representing 49 percent of total open interest in the March 1995 Nikkei futures

[205] Kuprianov, et al., 1995

contract and 24 percent of the open interest in the June contract. His position in Japanese government bond futures of 26,000 contracts sold represented 88 percent of the open interest in the June 1995 contract. Leeson even took on positions in Euroyen futures. He began 1995 with long positions in Euroyen contracts (a bet that Japanese interest rates would fall) but then switched to selling the contracts. By February 23, Leeson had accumulated a short position in Euroyen futures equivalent to 5 percent of the open interest in the June 1995 contract and 1 percent of the open interest in both the September and December contracts.[206]

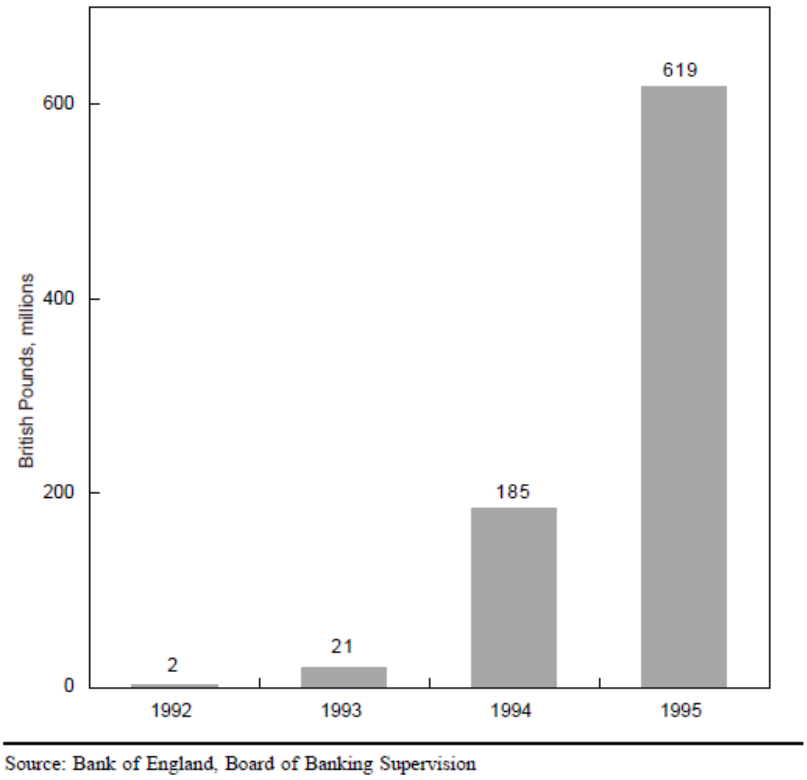

Figure 8: True net position of Barings in British Pounds

In 1890, Barings almost failed after losing millions in loans to Argentina, but it was rescued on that occasion by a consortium directed by the Bank of England. Another effort

[206] Kuprianov, et al., 1995

was assembled during February 1995, but the efforts failed when no buyer could be found and the Bank of England decided not to assume liability for Baring's losses.[207] On February 27, 1995, Barings Plc. went into receivership, unable to meet further margin requirements on SIMEX, with total capital of £362 million ($615 million). The Dutch banking group ING (Internationale Nederlanden Groep) assumed all liabilities (£660 million), and the entire firm was sold for £1.00.

Leeson was eventually tried and convicted of fraud charges in Singapore and sentenced to a 6 1/2 years' term in prison. In July 1999, he was released and currently participates in conferences and symposiums, mostly presenting on market risk and fraud.

Aftershocks

Upon learning that Barings would not be able to meet its margin calls, both SIMEX and the OSE took control of all the bank's open positions; the Nikkei index fell when market participants knew the exchanges would be liquidating such large positions. Markets were further confused when SIMEX announced it would double margin requirements on its Nikkei stock index futures contract effective February 28. Several of the exchange's U.S. clearing members threatened to withhold payment of the additional margin required by SIMEX, demanding assurance that those funds would be used solely to collateralize their own accounts and not to cover Barings's losses. Not paying would have caused the affected dealers to loss their positions, in which case SIMEX would have been faced with a series of defaults. Some market participants feared that the very solvency of the SIMEX clearinghouse was in question. It did not clearly help the situation as Japanese and Singaporean regulators were rather slow to inform market participants of the steps they

[207] Kuprianov, et al., 1995

were taking to insure the financial integrity of the exchange clearinghouses.[208, 209] SIMEX's margin calls were eventually met, and a potential crisis was avoided. As one of the largest clearing member firms on SIMEX, BFS handled clearing and settlement for 16 U.S. firms and was the custodian of $480 million in margin funds on their behalf when it went bankrupt.

Futures exchanges in the U.S. normally execute the prompt transfer of funds to other firms of all customer accounts of a financially troubled clearing member, but Japanese law contains no similar provisions, something that was not known before the collapse of Barings. Most of BFS's customer accounts had been booked through Baring Securities entity in London, so SIMEX did have access to detailed customer positions on an individual basis, but only a single common account for Baring Securities. To complicate things further, the vast majority of the information that Leeson had booked in Barings's systems and provided to the exchange was false. This seemed to be the perfect storm for positions of individual customers. Over the next week, U.S. customers of Barings's produced detailed documentation of their transactions to SIMEX and OSE, but it was not until March 9 when ING took over Barings that the customers were fully granted access to their funds.

Lessons from the Barings Debacle

The losses suffered by Barings, which led to its ultimate demise, provide a good example of the market and operational risks associated with derivatives. The inquiry

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[208] Szala, Ginger. *"Bad men, brokers and greed."* Futures: News, Analysis & Strategies for Futures, Options and Derivatives, September 1995, Vol. 24 Issue 10, pp. 8.
[209] Nusbaum, David., Reerink, Jack. *"BoE report details Barings' guiles, goofs."* Futures: News, Analysis & Strategies for Futures, Options and Derivatives, September 1st, 1995, pp. 12.

conducted by the Bank of England's Board of Banking Supervision concluded that *"Barings' collapse was due to the unauthorized and ultimately catastrophic activities of, it appears, one individual (Leeson) that went undetected as a consequence of a failure of management and other internal controls of the most basic kind. Management failed at various levels and in a variety of ways . . . to institute a proper system of internal controls, to enforce accountability for all profits, risks and operations, and adequately to follow up on a number of warning signals over a prolonged period."*[210]

In addition, the same board provided a list of warnings signs. First was the *lack of segregation of duties between front and back offices.* An internal audit indicated the lack of clear roles and responsibilities. Barings's management failed to act and implement these recommendations.[211] Second were the *significant sums of money requested by Leeson for funding.*[212] In the period between December 31, 1994, and February 24, 1995, Barings provided Leeson with £521 million to meet margin calls. When Leeson's activities were finally discovered, the total funding of BFS stood at £742 million, more than twice the reported capital of the Barings Group. Third was the *unreconciled balance of funds transferred to BFS to meet margin calls.* Leeson justified the need for additional funds by stating the money was needed for client accounts, but he never provided specific information about these accounts or the identity of the clients. Barings's management never challenged him in the sense that an on-site examination of Leeson's accounts came too late to save the bank. Fourth was the *apparent high profitability of Leeson's trading activities relative to the low level of risk as perceived and authorized by Barings's*

[210] Board of Banking Supervision, *"Report into the collapse of Barings Bank."* July 18, 1995, para. 14.1. *https://www.gov.uk/government/publications/report-into-the-collapse-of-barings-bank.*
[211] Sinha, Tapen. *"Lessons from Barings."* Chartered Accountants Journal, August 1995, pp. 20.
[212] Board of Banking Supervision (1995), para. 6.21.

management in London. High returns typically entail high risk. Leeson's reports were never challenged until too late. How could he have been reporting strong profits in such a risk-risk activity? Leeson was widely regarded as *"almost a miracle worker,"* and there was *"a concern not to do anything which might upset him."*[213] Fifth was the *discovery of discrepancies in Leeson's accounts by outside auditors.* Barings's auditors, C&L, informed the bank's management of a £50 million ($78 million) discrepancy in BFS's accounts on or before February 1, 1995.[214] Sixth were *communications from SIMEX*. The significant and rather fast buildup of Leeson's positions during January 1995 prompted SIMEX to seek assurances from Barings's senior management in London on the ability of BFS to fund its margin calls. More worrisome, though, is the lack of communication between securities and future exchanges and regulators in different financial districts and countries.[215] Both SIMEX and OSE were fierce competitors providing derivatives on the same financial products. Seventh were *market rumors and concerns made known to Barings's management in January and February*. Barings's management had significant cause to be alarmed about Leeson's activities, in the form of enquiries by the exchanges and the BIS, but management was too slow to act on these warning signs.

Five additional lessons, directly applicable to financial institutions, can be derived. First, management teams have a duty to fully understand the businesses they manage and the consequences of the company and employee activities. Second, roles and responsibilities for each business activity and function have to be clearly established and communicated. Third, a clear segregation of duties is required to maintain an effective

[213] Board of Banking Supervision (1995), para. 7.12.
[214] Sinha, et al., 1995
[215] We can also mention the issues emanating from the conflicting laws on the legal status of customer accounts at futures and options broker dealers in the event of insolvency. Kuprianov, et al, 1995, pp. 34.

control system. Fourth, an independent risk management function, in addition to relevant internal controls, must be established for all business functions. Fifth, the Audit Committee and senior leadership have to ensure that significant gaps in controls, policies, and procedures, either self-identified or identified by the internal audit function, are promptly resolved and tested.[216]

Last, but not least, the Board of Banking Supervision's report did not blame the collapse of Barings on its use of derivatives. Instead, it placed responsibility for the debacle on poor operational controls at Barings:

"The failings at Barings were not a consequence of the complexity of the business, but were primarily a failure on the part of a number of individuals to do their jobs properly.... While the use of futures and options contracts did enable Leeson to take much greater levels of risk (through their leverage) than might have been the case in some other markets, it was his ability to act without authority and without detection that brought Barings down."[217]

[216] Board of Banking Supervision (1995), para. 14.2.
[217] Board of Banking Supervision (1995), para. 14.35.

CHAPTER 3: CONCLUSION

The last 30 years have provided a significant number of financial crises, ranging from financial booms and busts and implosion of hedge funds and entire regions; even though the first 20 years of this period had come to be known as the Great Moderation, cases of rogue trading existed. At the same time, we have observed in the previous pages the events often attributed to "rogue trading" by individuals or groups. Bankers and regulators are often quick to characterize these events as very rare, almost unpredictable. The purpose of this thesis has been to review in detail seven of the larger cases in history to better understand the common elements between them and possible solutions.

Lessons Learned

The discovery of rogue trading scandals is often followed by extensive reviews by independent parties, committees chaired by regulators or exchanges, and, in some cases, Congressional hearings. Some other events not analyzed as part of this research, including Rusnak's fraudulent behavior at Allied Irish Bank and Jett's fraudulent activities at Kidder Peabody, were promptly followed by independent reports[218] which dissected events and specific gaps in controls.

[218] Allied Irish Bank commissioned Eugene Ludwig, a former U.S. Comptroller of the Currency, to provide a report (known as "Ludwig Report") containing details on what had gone wrong. Kidder Peabody

After an extensive review of the analysis, findings' and recommendations, a significant number of lessons emerge:

1. *Right tone from the top.* More often than not, rogue trading cases and their subsequent analyses have historically been lagging on highlighting the importance of setting the "right tone from the top." Boards of directors and senior management should make a constant emphasis on integrity, and any compliance concerns should be promptly raised to independent functions within the organization, like Audit (3rd Line of Defense). This expectation should be communicated to all employees and 3rd parties alike (suppliers and vendors). This was clearly lacking in some of the cases, like Société Générale, Sumitomo, and Daiwa Bank, as senior managers often ignored any signs of wrongdoing and clearly failed to establish an environment of accountability and honesty. Consequently, rogue traders could roll losses and maintain fraudulent activity for many years. Boards and senior management should also play an active oversight role as it related to alignment between risk taking, company risk appetite statement, and limits or thresholds in place.[219]
2. *Clear understanding of the products traded.* It should be clear at this point that potential market and operational risks may significantly offset any benefits from proprietary trading. It is very important that senior managers and supervisors understand the intricacies of the strategies and instruments traded by their

commissioned Gary Lynch, a former Director of the Division of Enforcement of the Securities and Exchange Commission ("SEC") to provide a report (called "Lynch Report").

[219] Risk Appetite Statement (Financial Stability Board, Principles for an Effective Risk Appetite Framework, November 13th, 2013): *"The articulation in written form of the aggregate level and types of risk that a financial institution is willing to accept, or to avoid, in order to achieve its business objectives, it includes qualitative statements, as well as quantitative measures expressed relative to earnings, capital, risk measures, liquidity and other relevant measures, as appropriate. It should also address more difficult to quantify risks, such as reputation and conduct risks, as well as money laundering and unethical practices." http://www.fsb.org/2013/07/r_130717.*

institutions. A proactive discussion of rationale and trading strategy (both to increase or exit) should happen on a regular basis with traders, with a clear understanding of the material trading losses if anything goes against the plan. JP Morgan, UBS, and Showa Shell found themselves in a state of confusion when strategies where implemented with no clear understanding of both rationale and exit strategies, which badly impacted these institutions with multi-million dollar losses and significant loss from a reputational perspective.

3. *Strong 1st and 2nd Line controls and reviews.* The front office, or 1st Line of Defense[220], plays a major role in the detection of any unauthorized, fraudulent, or significant risk taking, but the 2nd Line of Defense [221] provides a fresh and independent perspective to ensure risk taking is in line with the firm's risk appetite and risk limits. As indicated above, the Ludwig Report provided a number of controls and recommendations to help detect and prevent rogue trading, the recommendations included: (i) a daily review of trades to be performed by a qualified supervisor, which needs to include not only the summary of the profits and losses in each ledger, but also the computerized summary of the information that would include all pertinent information on a trade ticket or the trade ticket; (ii) frequent reviews of exception reports, which would show unusually large transactions, large profit and loss ("P&L") swings, unusual settlement terms and dates, and any significant counterparty activity; and (iii) procedures for the creation, monitoring, and enforcement of position and trading limits (and intraday monitoring to ensure that traders stay within these guidelines) by trader and by

[220] 11
[221] 220

trading desk. In addition, the Ludwig Report also recommended that, for each product the firm trades, the firm should document the market strategy; establish clearing, credit, trading, and settling procedures in advance; and then monitor results against the documented strategy. Finally, individuals and management who monitor and control trading should receive specialized training in the detection of rogue trading, and they should be made aware of which traders used to work in other sensitive areas of the bank, such as IT, Compliance, or Settlements.

4. *More scrutiny, not less, for successful traders.* Companies that turn a blind eye or do not perform effective challenges to their top performers end up paying dearly. As indicated by former SEC Chairman Arthur Levitt, Jr.: *"I have found that where you have a firm where one person or a small group of people are contributing an inordinate amount of profitability to the enterprise, then that is a warning sign that should be examined closely."*[222] As observed in the Barings' collapse, the Bank of England investigation found that *"management failed at various levels and in a variety of ways to institute a proper system of internal controls, to enforce accountability. … to follow up on a number of warning signals over a prolonged period."* Years later, Leeson stated in an interview that *"Barings would never have collapsed without the incompetence of others who should have known what was going on but either failed to detect it, didn't properly investigate, or turned a blind*

[222] Eichenwald, Kurt. *"Learning the Hard Way How to Monitor Traders."* The New York Times, Mar. 9th, 1995, D1. One of the more prominent examples of the importance of scrutinizing successful traders and business units is Michael Milken at Drexel Burnham Lambert ("Drexel"). In 1990, the SEC settled a civil action against Milken, alleging that he devised and carried out a fraudulent scheme involving insider trading, stock manipulation, fraud on Drexel's clients, failure to make required disclosures of beneficial ownership of securities, and violations of the margin rules, as well as other violations. Through this scheme, he was able to amass huge profits. See SEC v. Michael R. Milken et al., Litigation Release No. 12454, 46 S.E.C. Docket 139 (Apr. 24, 1990), available at 1990 WL 311705.

eye."[223] The same group think was observed in the case of Société Générale and Sumitomo; as the rogue traders continued to make money, no one dared to ask questions or challenge their activities.

5. *Incentive structures must not encourage excessive risk taking.* Incentives are an important way to manage risks associated with trading operations. Once again, the Ludwig Report suggested that compensation arrangements with traders should be in line with the market, and empower management with latitude so other factors than trading performance can be considered when determining annual compensation.

   Likewise, in Congressional testimony on Iguchi's fraudulent trading at Daiwa Bank, it was noted that in order to avoid excessive risk taking and align traders' interest with long term company objectives trader compensation structure should be designed carefully. In particular, it was suggested that senior management should consider several aspects when establishing or reviewing compensation programs and determining bonuses: (i) the employee's compliance with firm policies, laws, and regulations; (ii) performance relative to the firm's stated goals and quality of earnings (e.g., risk-adjusted returns); (iii) competitors' compensation practices for similar roles; (iv) individual's overall performance; and (v) the levels of risk inherent in and caused by the relevant trading activity.[224] After the Great Recession of 2007-2008, some market analysts and regulators suggested deferring bonuses until the full impact of a trader's strategy is clear via claw back clauses, to

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[223] Janowski, Davis D. "*Rogue Trader Nick Leeson Signs for Software Firms*." Investment News, Issue 41, Oct. 29th, 2007.

[224] Eugene Ludwig, Comptroller of the Currency, *Testimony Before the H. Subcommittee on Financial Institutions and Consumer Credit of the Committee on Banking and Financial Services.* Dec. 5th, 1995. *http://www.occ.treas.gov/ftp/release/95-133.txt.*

prevent the trader from benefiting from short-term, high-risk bets that may go bad.[225]

6. *Vacations are good and necessary.* The Two-Week Block Vacation policy that many firms have in place should be rigorously enforced industrywide. Per media reports regarding SocGen, Kerviel neither took the mandatory vacations nor allowed other traders to monitor his portfolios when he did take time off.[226] He only took four days of vacation in 2007 – something that should have been a red flag to his managers and supervisors, per Kerviel. As noted by one source, Kerviel attributed his ability to avoid detection to (among other things) his lack of vacations, and he recently noted that *"a trader who doesn't take vacation is a trader who doesn't want to leave his book to someone else."*[227] After the scandal, the U.K.'s Financial Services Authority recommended in a newsletter it published, that firms should require two consecutive weeks of vacation, which would allow other colleagues to inspect traders' books and ensure they were valued correctly.[228]
7. *Position valuations and strategies should be challenged by Risk Managers.* Risk managers and groups in charge of verifying traders' positions should be encouraged to question valuations when they appear idiosyncratic, regardless of the success of the trader or the strategy under assessment. Some industry commentators have suggested that an industry culture of deference by risk managers to successful

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[225] Tett, Gillian. "*Bankers Plan Pay Code to Head Off Backlash." Financial Times.com,* Mar. 4th, 2008. *See also* Rajan, Raghuram. "*Bankers' Pay Is Deeply Flawe*d," Financial Times.com, Jan. 8th, 2008. As evidenced by Kerviel, who appears to never actually have profited from his trades at SocGen, compensation is not the only motivation to engage in rogue trading.

[226] Viscusi, Gregory, Chassany, Anne-Sylvaine. *"Kerviel's 2007 Bets Raise SocGen Oversight Questions."* Bloomberg.com, February 19, 2008.

[227] Viscusi, et al., 2008.

[228] Financial Services Authority, Markets Division. *"Newsletter on Market Conduct and Transaction Reporting Issues."* Issue No. 25, March 2008. *http://www.fsa.gov.uk/pubs/newsletters/mwnewsletter25.pdf.*

traders may significantly contribute to pricing failures and exceedingly optimistic valuations on firms' books.[229] JP Morgan's CIO team positions were not properly price verified and even models were not properly developed and maintained. The CIO trading desk had less scrutiny than other trading desks at JPM as it was assumed it solely invested in fixed income instruments. On the other hand, Sumitomo did not have an independent team verifying prices and trading accounts, a practice which could have alerted management to manipulation and fraud. Thus, there was no oversight or effective challenge in place at the time of the event.

8. *Distinct reporting lines for Compliance, Operations (back and middle office), and Risk Management.* A key factor to a successful reporting structure is the complete segregation of duties from the front and back offices, with clearly defined roles and responsibilities. Compliance and Market Risk personnel, for instance, should be empowered to act against traders who repeatedly violate their procedures and trading limits. Similarly, a hotline or e-mail address (ombudsman) should be established to enable employees to report any suspected fraudulent activity anonymously and without any fear of retaliation. Greater communication among Compliance, Internal Audit, Operations, and Risk Management should be encouraged whenever possible not only in times of crisis – when either rogue trading or any other fraudulent activity is suspected- but also as a best practice.

   As suggested by the Ludwig Report, operations and risk control personnel should be independent of the 1st Line of Defense and report separately to the chief executive officer up through the chief financial officer or another senior executive.

[229] Hughes, Chris. "*Deference May Explain Trading Failure.*" Financial Times, Feb. 20th, 2008.

Moreover, firms should consider requiring special screening for staff who move from back-office functions to become traders. As indicated in the Barings' case, Leeson managed the back and front office, so there was unique opportunity to manipulate settlement and other reports. Likewise, in the case of SocGen, Kerviel allegedly exploited his knowledge of back-office systems and processes gained as a former middle-office employee to build up undetected losses.[230] Similarly, like Kerviel, Iguchi rose through the ranks, moving from the back office to become a trader. A lack of segregation of duties within his group allowed him to hide his losses from his superiors for a very long period.

9. *Back office controls must be Strong.* By ensuring that effective and efficient controls are in place, but especially in the back-office controls, senior managers and their firms can greatly decrease the likelihood that unauthorized activity will continue undetected, while also decreasing the severity in case of an event. The Ludwig Report recommended that back-office employees should prepare daily reports and reports for periodic distribution to senior management, which should include (i) daily P&L movements, (ii) statistics relevant to indicate growing operational issues such as unconfirmed trades and unreconciled accounts, and (iii) counterparties' open transactions. This report also recommended that formal alert reports on open items should be developed and frequently tested.[231]

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[230] Hanes, Allison. "*Kerviel Joins Ranks of Master Rogue Traders.*" National Post, January 25, 2008.

[231] In its Progress Report, the Special Committee of the Board of Directors of Société Générale also noted that weaknesses in SocGen's supervision and control system – in particular, the weak operational risk prevention systems – allegedly contributed to Kerviel's ability to hide his losses and continue his fraud. *Progress Report of the Special Committee of the Board of Directors of Société Générale.* Feb. 20th, 2008. http://www.sp.socgen.com/sdp/sdp.nsf/V3ID/6D44E7AEF3D68993C12573F700567904/$file/comiteSpecialFevrier08gb.pdf

It is also critical that traders and other 1st Line of Defense personnel do not have access to systems that allow them to manipulate trading information, pricing data, and pricing models, as it was the case in SocGen.

10. *An Effective and Resilient Risk Management Framework is required.* Any flawed risk management structure or practice can quickly become onerous as it transforms market risk exposures into significant economic losses.[232] Risk and risk taking are inherent in proprietary trading, and it is easy to lose a great deal of money in a brief period, so market experts have emphasized that it is critical for proprietary trading operations to use the best decision tools and infrastructure available. In addition, any deficiencies of these systems detected via periodic reviews should be reported while also addressing the solutions to audit or any appropriate committees. For instance, following Iguchi's losses at Daiwa Bank, it was noted in Congressional testimony that a successful risk management system should satisfy at least four basic principles: (i) embody well-conceived risk identification measures and reporting, (ii) be subject to active oversight by the board of directors and senior management, (iii) incorporate a well-defined structure of limits on risk taking, and (iv) include comprehensive internal controls emphasizing the clear separation of duties.[233] Not less important is the need for comprehensive anti-fraud training for all employees, at least on an annual basis. SocGen showed clear signs of inadequate

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[232] Becker, Brandon, Mazur, Francois-Ihor. *"Risk Management of Financial Derivative Products: Who's Responsible for What?"* 21 J. CORP. L. 177, Fall 1995.

[233] *See* Report for Congress on Daiwa Bank, *supra* note 5. Investigation and Oversight of Daiwa Bank and Daiwa Trust Company: Hearing before the Committee on Banking, Housing, and Urban Affairs, United States Senate, November 27th, 1995.
https://archive.org/stream/investigationove00unit/investigationove00unit_djvu.txt

resources allocated to control functions and specifically towards fraud prevention and detection.

By reviewing high profile cases, evidence was sought to examine the proposition that we are dealing not with completely unforeseeable or "rogue" phenomena but with behavior that typically manifests itself in situations in which structural deficiencies, like poor culture, lack of controls, and imbalances in incentives exist. A review of conditions surrounding the most highly publicized instances yields evidence to support this proposition. For example, we see that external and internal controls and formal and informal regulatory agencies failed, in virtually all the cases investigated, to play any role in detecting or preventing the activities of the "rogue" traders or groups of traders. Furthermore, in cases in which signs of potentially improper conduct was detected, little or nothing was done to remedy the situation on a timely basis.

Short-term financial reward could have been a significant driver in the events analyzed, but this was not the case for most of them. The fear of failure appears as a clearer motivator and was seemingly much stronger than the fear of detection. Not surprisingly, these "rogues" were responsible for a very large portion of the income of the firms they worked for or, at least, a big part within their divisions. It is important to highlight that those responsible for oversight are all, in one form or another, dependent on the profitability and success of the companies for their own rewards. In the case of Hamanaka, several financial institutions supported his activities as they could profit -via fees- from his firm. Even external auditors find themselves in a similar situation, as they are often dependent on the firms they audit for lucrative auditing or consulting contracts. In the case of exchanges, LME was the greatest supporter of. Hamanaka and his firm, Sumitomo, and even in the

case of Barings, SIMEX was one of Nick Leeson's greatest supporters as they were eager to profit from both volume and fees. Even regulators have been slow to react, as it was observed in the case of Daiwa.

In most of the cases analyzed in this thesis, we observe that losses resulted from traders trying to recoup existing losses that were undetected for a period (e.g., Hamanaka, Iguchi, and Leeson). In all cases, the initial losses, if disclosed immediately, would have had a limited impact on the companies involved.

One of the most important effective and efficient risk management tools available to those responsible for overseeing market participants is the establishment and enforcement of trading limits. If trading limits had been rigorously enforced, it would not have been possible for these traders to build up positions with potentially ruinous effects. Individuals outside the companies analyzed were very aware of the size of the positions taken; in some cases, efforts were made to warn the firms involved, but in no case did these messages prompt an investigation and action by the firms. Iguchi noted that *"it was not a case of not being able to see, but rather a case of not wanting to see."*[234] Additionally, the products traded by most of the "rogues" were very similar. These leveraged products increased the speed of onset of the debacles and, in some cases, the lack of knowledge on how these products work made matters worse.

Solutions to rogue trading activities

The solution to the problem requires a holistic approach presented below.

[234] TIME, et al. 1997.

Risk culture can be defined as *the degree to which risk management is valued throughout an organization*. McKinsey, the consulting firm, defines it as follows: *"The norms of behavior for individuals and groups within an organization that determine the collective ability to identify and understand, openly discuss and act on the organization's current and future risks."*[235] Not to be confused with risk appetite, risk culture refers to the shared values and beliefs that enable people to work within an organization's boundaries of acceptable risk taking.

A sound risk culture consistently supports appropriate risk awareness, behaviors and judgements about risk-taking within a strong risk governance framework. A sound risk culture bolsters effective risk management, promotes sound risk-taking, and ensures that emerging risks or risk-taking activities beyond the institution's risk appetite are recognized, assessed, reported to senior management, and addressed in a timely manner.

A sound risk culture should emphasize throughout the institution the importance of ensuring that (i) an appropriate risk-reward balance consistent with the institution's risk appetite is achieved when taking on risks; (ii) an effective system of controls commensurate with the scale and complexity of the financial institution is properly put in place; (iii) the quality of risk models, data accuracy, capability of available tools to accurately measure risks, and justifications for risk taking can be challenged; and (iv) all limit breaches, deviations from established policies, and operational incidents are thoroughly followed up with proportionate disciplinary actions when necessary. The best way to assess risk culture is leveraging a survey instrument that is valid (measures what it intends to measure),

[235] Levy, Cindy, Lamarre, Eric, Twining, James. *"Taking control of organizational risk culture."* McKinsey Working Papers on Risk, Number 16, February 2010.

reliable (will produce consistent results if repeated), as short as possible to reduce survey fatigue, and less likely to be gamed.

This assessment[236] should yield several benefits. First, a valid base-line will be established. Any future programs to change culture (with or without the assistance of consultants) can therefore be objectively assessed relative to this initial benchmark. Second, differences in risk culture across an organization can be identified, allowing future change efforts to be targeted appropriately. Third, the determinants of risk culture within an organization will be identified. The assessment will attempt to show the organization where they have strengths and weaknesses in relation to peer companies. Fourth, participation will lead to a growing understanding of the importance of culture throughout the organization (not just among risk professionals) and early access to research findings. Fifth, the organization can gain an understanding of the strength of its own culture relative to peers. Where the organization performs relatively well, this information can be used as an independent verification of cultural strengths which may be of interest to stakeholders such as prudential supervisors, ratings agencies, and shareholders. If the organization performs relatively poorly, this information can be used to help justify greater efforts to reform culture and governance.

The goal of the assessment is to create a sound risk culture which will be evidenced by a strong tone from the top, effective challenge (oversight), accountability in all activities

[236] This assessment template was created by the author of this thesis leveraging work developed at Synchrony Financial, in addition to a diverse set of authors and consulting firms. The material was presented at CPAC (Contingency Planning Association of the Carolinas) 2017 Symposium, Concord, NC, March 9-10, 2017. *http://www.cpaccarolinas.org.*

performed by the company, and clear definition of incentives. These indicators are not exhaustive and do not represent a checklist or an end-point for supervisory review.

Additional measures

In recent years, new bodies of research have emerged with the extensive use of computers and networks, artificial intelligence, big data, and machine learning. We read in newspapers and other media how companies are implementing these tools to both solve old problems and create new ways to conduct analysis and understand the patterns revealed by analysis of large datasets. Most recently, we learn that JPMorgan[237] has developed software called COIN (Contract Intelligence) that does in seconds what used to be done by 40 full-time lawyers working for a whole year reviewing commercial loan agreements.

Trading desks are highly transactional environments, involving significant money flows. Trading activities are subject to many controls, including but not limited to market risk reporting, P&L, risk limits per trader and trading desk, middle office checks and valuation testing, trade confirmations, monitoring, and back office payments and settlements.[238] In most organizations, these activities are monitored by different individuals in different departments and even geographies and, in the aggregate, sound like an operational risk nightmare. Artificial intelligence and machine learning can assist in monitoring a large number of variables -against specific values and patterns- and correlations to indicate possible fraud or collusion.

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[237] Son, Hugh. *"JPMorgan Software Does in Seconds What Took Lawyers 360,000 Hours."* Bloomberg. February 27th, 2017. https://www.bloomberg.com/news/articles/2017-02-28/jpmorgan-marshals-an-army-of-developers-to-automate-high-finance.

[238] Chapelle, Ariane. *"Rogue trading, no training: the connections,"* RiskBusiness International Ltd., December 2011, pp. 3.

Furthermore, rogue traders will generate (1) high transaction cancellations and modifications, (2) delayed start dates in unusual transactions, market deals with different prices than obtained via price verification processes, and, (3) absence of confirmations by third parties, all of which are indications of false trades.[239] Pending confirmations will surface in end-of-day reports, and daily exception reports will contain unusual market transactions, yet all these signals can be ignored or go unnoticed. Artificial intelligence and machine learning can support by generating specific red flags that will prompt additional investigations or follow ups.

[239] Chapelle, et al., 2011, pp. 4.

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