Journal of Business Ethics (2020) 165:633–657
https://doi.org/10.1007/s10551-018-4096-7

ORIGINAL PAPER

Whale Watching on the Trading Floor: Unravelling Collusive Rogue Trading in Banks

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Received: 19 March 2018 / Accepted: 19 December 2018 / Published online: 3 January 2019

Abstract

Recent history reveals a series of rogue traders, jeopardizing their employers' assets and reputation. There have been instances of unauthorized acting in concert between traders, their supervisors and/or firms' decision makers and executives, resulting in collusive rogue trading. We explore organizational misbehaviour theory and explain three major collusive rogue trading events at National Australia Bank, JPMorgan with its London Whale and the interest reference rate manipulation/LIBOR scandal through a descriptive model of organizational/structural, individual and group forces. Our model draws conclusions on how banks can set up behavioural risk management and internal control frameworks to mitigate potential collusive rogue trading.

Keywords Behavioural risk · Collusion · Corporate culture · Misconduct · Organizational misbehaviour theory · Rogue trading

JEL Classification K42 · M14 · P37

Introduction

Rogue behaviour of employees has gained media attention in the years following the financial and sovereign debt crisis while the academic literature has yet to analyse the commonalities of such threats to a company's assets and reputation.

For the purpose of this paper, we follow Wexler (2010, pp. 3–4) and distinguish rogue traders from professional speculative traders. The latter are self-reliant opportunists—valuing their independence (Land et al. 2014, p. 234) and seeking, whenever possible, to increase monetary earnings—who act as mercenary risk takers. The species of speculative traders within banks is at risk of extinction due to regulatory recommendations to ban proprietary trading activities at trading floors of investment or universal banks, such as the Volcker Rule or the recommendations of the Liikanen Group.[1] In contrast, rogue traders (a subset of speculative traders) are engaged in excessive, unauthorized and often concealed market transactions.

Rogue trading activities follow in principle one common mechanism: unauthorized open positions are (supposedly) offset by fake positions and/or other concealment techniques such as mismarking. Rogue traders predominantly exceed the financial institution's trading limits and, in the case of

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[1] The Volcker Rule as part of the Dodd-Frank Act banning proprietary trading for commercial banks became effective on July 21, 2012 with the Federal Reserve (FED) extending the conformance period until July 21, 2017. On February 3, 2017, U.S. President Donald Trump signed an order to review the Volcker Rule and other regulations growing out of the 2010 Dodd-Frank financial reform law. Regulators began working on a potential revision in July 2017. End of May 2018, the U.S. Congress approved a regulatory rollback of the Dodd-Frank Act, leaving a fewer than ten big banks in the U.S. subject to stricter federal oversight, but freeing banks with less than USD 250bn in assets (Rappeport and Flitter 2018). The Liikanen Group, an expert group of the European Commission for structural banking reforms, founded by Erkki Liikanen, governor of the Bank of Finland and European Central Bank (ECB) council member, recommending the separation of proprietary trading and other high-risk trading activities (Liikanen 2012).

creating trading loss positions, exceed the financial institution's loss limits (Financial Industry Regulatory Authority 2008).

The typical rogue trader is male, in his mid-thirties, undetected for more than two and a half years, creates a financial damage of more than USD 1.5 bn and is sentenced to jail for about 5 years, see "Unravelling Collusive Rogue Trading (CRT)" section and Table 1 for details.

In banks, no trader is purely acting on his or her own, since trading activities and their underlying processes are segregated into front, middle and back office functions. Unauthorized acting in concert between traders, their supervisors, internal control functions and/or firms' decision makers and executives results in the existence of 'rogue desk[s]' (Skyrm 2014a, p. 20). We expand the same by introducing the typology collusive rogue trading (CRT).

The interest reference rate manipulation/LIBOR scandal by several traders from Barclays Bank, Citigroup, Deutsche Bank, JPMorgan, Lloyds Bank, Royal Bank of Scotland, UBS and others, shows that CRT is not necessarily contained within individual corporations but can even happen across them.

Building on Leaver and Reader (2017), analysing trading misconduct investigations through the lens of safety culture theory, we focus on organizational misbehaviour (OMB) theory and the dark side of organizations.

At first, we offer an introduction to the status of OMB theory research to recognize and understand theory paradigms, of which we build a descriptive model of organizational/structural, individual and group forces. With our approach, we follow De Cremer and Vandekerckhove (2017) who emphasize the importance of a descriptive approach, which is grounded in the behavioural sciences—referred to as behavioural business ethics—versus a prescriptive approach. Subsequently, we examine three major CRT events at National Australia Bank (NAB), JPMorgan with its London Whale and the interest reference rate manipulation/LIBOR scandal via an evidence-based evaluation of the outlined OMB theory propositions to ascertain whether our model offers a valuable framework for understanding the cases. We use three sources of information for the case study examination: publicly available investigation reports—prepared and issued by regulatory authorities/supervisors as well as authorized delegates like accounting or law firms engaged by the involved banks—published academic research and news/media information about fines/regulatory sanctions imposed on affected banks and the prosecution status of individuals involved in the CRT events. We apply a case analysis methodology, extracting modus operandi, risk management failures and control weaknesses as well as early warning signals from the information analysed before we examine the CRT events alongside the organizational/structural, individual and group forces of our model. We finally draw conclusions regarding behavioural risk management and internal control frameworks to mitigate potential CRT.

Organizational Misbehaviour (OMB)

In the following, we summarize the status of research of the dark side of organizations and inform about norms and culture before we explain our descriptive model of organizational/structural, individual and group forces.

Researching the Dark Side of Organizations

Merton (1936) highlights, that any system of action inevitably generates secondary consequences, which run counter to its objectives with unexpected optimal or suboptimal (e.g. dark) outcomes. The dark is metaphorically used as a synonym for the bad, undesirable and unwanted. Linstead et al. (2014, p. 173) characterize the dark side as indelible feature of capitalism, its ultimate destination.

Researching the 'dark side' of organizations as a phenomenon has been initially a discipline of sociology and organizational psychology. Closely linked is the analysis of organizational behaviour (OB), which has been increasingly confronted with ethical, moral and ideological concerns—flanked by the existence and medial presentation of corporate accounting scandals in the United States in the late 1990s and early years of the twenty-first century, e.g. Enron, WorldCom and Tyco International—as matters of a negative (dark) side of OB, i.e. organizational misbehaviour, hereafter OMB.

Vardi and Weitz (2016, p. 14) highlight three distinct phases in the evolution of OMB theory research: the early phase (the mid-1950s to the late 1970s; a period of sporadic and non-systematic research), the formative phase (the early 1980s to the mid-1990s; a period of wide scholarly calls for systematic research, the evolvement of major areas of interest and an emergence of case-based and practitioner-oriented literature) and the current phase (mid-1990s to date; a period aiming towards a full integration of the emerging sub-field of OMB into mainstream OB).

Research in work organizations provides ample evidence for the large variety of OMB—including interrelated and overlapping sub-interests like employee deviance, workplace aggression and political behaviour—mirrored in current phase research focussing on incivility (Lim et al. 2008; Cortina and Magley 2009; Reich and Hershcovis 2015), lying and deceiving (Shulman 2007; Grover 2010), whistleblowing (Miceli et al. 2008; Mayer et al. 2013), sexual harassment (Willness et al. 2007; Popovich and Warren 2010; McDonald 2012) and bullying (Glambek et al. 2014), see

Table 1 Unauthorized trading losses caused by rogue traders in banks

Year	Name	Financial Institution				Trader			
		Country	Time to detect (years)	Loss [USD bn]	Fine [USD bn]	Name	Age when detected	Imprisonment (suspension) (years)	Fine [USD k]
Collusive rogue trading (CRT)									
2012	UBS[a]	U.K.	~6	N/A[b]	1.47[c]	Thomas Hayes[d]	32	14 (3)	1394
	Barclays Bank[a]	U.K.			0.54	Jay Merchant[d]	42	5.5 (1)	472
						Alex Pabon[d]	37	2.75 (1.8)	3.64
						Jonathan Mathew[d]	30	4	54.96
						Peter Johnson[d]	57	4	228.89
						Philippe Moryoussef[d]	44	8	
	Deutsche Bank[a]	U.K.			3.75	Christian Bittar[d]	40	5.3	4448
	Rabobank[a]	U.S.			1.01	Paul Thompson[d]	46	0.25	
2012	JPMorgan Chase & Co.	U.K.	0.25	6.2	1.02	Achilles Macris	50		1256
						Javier Martin-Artajo	48		
						Bruno Iksil	N/A		
						Julien Grout	34		
2004	National Australia Bank	Australia	2.25	0.33		David Bullen	32	3.6	
						Luke Duffy	34	2.5	
						Vince Ficarra	25	2.3	
						Gianni Gray	34	1.3	
Other									
2011	UBS	U.K.	~3	2.3	0.05	Kweku Adoboli	31	7 (3.5)	
2008	Groupe Caisee d'Epargne	France	0.6	0.98		Boris Picano-Nacci	34	2 (2)	463050
2008	Société Générale	France	2.5	6.9	0.01	Jérôme Kerviel	31	5(2)	
2006	Amaranth Advisors	U.S.	1	6.6		Brian Hunter	31		30000
2005	China Aviation Oil	Singapore	1.2	0.55		Chen Jiulin	44	4.25	335
2002	Allied Irish Banks	U.S.	3.6	0.69		John Rusnak	37	7.5	1000 + 691000 (restitution)
1996	Sumitomo Corporation	Japan	10	2.6		Yasuo Hamanaka	46	8	
1996	Morgan Grenfell	U.S.	1.25	0.34		Peter Young	38	–[e]	
1995	Barings Bank	U.K.	2.5	1.3		Nick Leeson	28	6.6	
1995	Daiwa Bank's	Japan/U.S.	12	1.1		Toshidhie Iguchi	44	4	
1994	Codelco	Chile	0.5	0.28		Juan Pablo Davilla	34	8	
1994	Kidder Peabody	U.S.	3.2	0.08		Joe Jett	36		8400
1987	Merrill Lynch	U.S.	1/12	0.38		Howard Rubin	36		20.4
1982	Drysdale Government Securities Corporation	U.S.	0.25	0.27		David Heuwetter	40	3 + 4 probation	–[f]

Table 1 (continued)

Source Authors' representation, based on Hornuf and Haas (2014), Skyrm (2014a) and Wexler (2010, p. 6), enriched with own research. Losses and fines in currencies other than USD are converted to USD using an average exchange rate for the respective year of detection for comparison

[a]At the time of writing, in total thirteen financial institutions (including two brokers) have been fined by regulatory authorities in light of the interest reference rate manipulation/LIBOR scandal; see for a complete overview (including fines paid) Table 6

[b]An estimated USD 300tn of contracts are based on LIBOR. An exact quantification of the financial loss caused by the LIBOR scandal is not possible

[c]UBS avoided another regulatory fine of USD 2.83 bn (EUR 2.5 bn) from the European Commission because of its expert witness role during the interest reference rate manipulation investigation

[d]For simplicity, we only show imprisoned traders involved in the LIBOR scandal; see for a complete overview including acquitted traders Table 7

[e]Found mentally unfit to trial

[f]Sentence comprised 400 h community service

Vardi and Weitz (2016, pp. 261–263) for a comprehensive review.

Sutherland's (1940) introduction of the white-collar crime (WCC) concept, grounded in criminological theory, marks an important contribution also to OMB in the early phase of its research. Currently, interest in OMB is emerging from sociological white-collar crime (WCC) research. Although WCC research offers important insights into the dark side of organizations, it fails to develop a systematic theory of OMB (Vardi and Weitz 2016, pp. 4, 16).

Given the serious impact and consequences—in the dimensions personal, social and financial—cases of misconduct especially in the financial industry can have and in order to contribute to the theoretical and empirical body of knowledge, we expand OMB theory into an unexplored domain, CRT in banks.

A simplistic approach to define OMB is 'anything you do at work you are not supposed to do' (Ackroyd and Thompson 1999, p. 2). Initial OMB research focusses on workplace violence and aggression as abnormal or deviant forms of behaviour (Griffin and O'Leary-Kelly 2004, p. 1ff) that is expanded into insidious workplace behaviour, theorizing a typology of intentional harmful workplace behaviour (which is subtle, low level rather than severe, repeated over time and directed at individuals or organizations) (Greenberg 2010, p. 16).

Vardi and Wiener (1996, p. 153) describe OMB as intentional action by members of organizations, which defies and violates shared organizational norms and expectations and/or core societal values, mores and standards of proper conduct. The focus on the intention allows the distinction to accidental or unintentional behaviour caused by errors, mistakes or unconscious negligence.

An important aspect of OMB is the linkage to and its interpretation in light of routine nonconformity. Related research explores routine nonconformity as a predictable and re-occurring product of all socially organized systems. The adverse outcome of it—generated by the interconnection between environment, organization, cognition and choice—materializes in three forms: mistake, misconduct or disaster. All forms are linked to extensive social cost for the public and are socially defined and attributed in retrospect when outcomes are known. Environmental uncertainty and because rules of the institutionalized environment are often unspecific and inappropriate to situations—formalization will never cover all conditions (Feldmann 1989)—are root causes for routine nonconformity (Vaughan 1999).

Dark side behaviour varies according to the specific situation, i.e. may be negative from an organizational perspective, but may appear normal, rational and even purposeful from an individual point of view (Linstead et al. 2014, p. 168). Luhmann (1999, p. 304ff) contextualizes

OMB by acting individuals with useful illegality, as being in breach with existing organizational rules by the explicit purpose and benefit of doing it, which offers a distinct view of most of the corporate misconduct/wrongdoing, including CRT.

Corporate and non-corporate acting takes place in the wider context of culture, flanked by values and beliefs of the involved individuals. We do not offer a comprehensive view on culture (if that is possible at all—supportive Geertz (1973), for whom cultural analysis is necessarily incomplete), but we offer a descriptive model, helping to explain practical implications of the relevancy of norms and culture in light of CRT in banks.

Norms

Adams (1997, p. 340) defines norms as informal social regularities, of which individuals feel obligated to follow because of an internalized sense of duty, because of a fear of external non-legal sanctions or both. There is an intensive discussion around the scope of the norm definition in general, as some researchers consider legal rules as norms, whereas others exclude not only legal rules but also formal organizational rules from norms. What is clear though is to draw a line of distinction between formalized organizational rules and norms, which are by the definition above informal.

The formal structure of an organization mirrored in its formal rules is in contrast to its day-to-day activities. The institutionalized environment is often unspecific, ambiguous and even conflicting. Meyer and Rowan (1977, pp. 341, 344) find that many formal structure elements are highly institutionalized and function as myths, as institutionalized norms are able to undermine formal/written rules of the organization (Krawiec 2000). Snook (2000) identifies the practical drift as a process of uncoupling practice from procedure to overcome the conflict of following ceremonial rules on the one hand and trying to achieve efficiency on the other. Snook's (2000) terminology does not immediately separate between unintended und intended norm drifts. Following the intentional orientation of OMB in this paper, we focus on the intentional side of norm drifts.

Norms cannot arise without consent and cooperation (Huang and Wu 1994; Tannenbaum 1961), who describes a permission leadership style), a general aura of confidence (which is, according to Hofmann (1967), maintained by avoidance, discretion and overlooking) and good faith of management (Meyer and Rowan 1977, p. 357ff).

Culture

Organizational culture is regarded as a construct denoting the extent to which members share core organizational values (Wiener 1988). Social literature defines value as an enduring belief in a specific mode of conduct or end-state of existence, which is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence (Rokeach 1973, p. 5). Wiener (1982) understands values as internalized normative beliefs, which once established act as built-in-normative guide for (mis)behaviour.

With regard to the theoretical application of culture in organizational and social contexts, researchers have shown the power of culture as a tool used by dominant groups (e.g. top management) to purposely influence and/or shape other members' behaviour, resulting in culture as a mechanism of control (Kunda 2006, pp. 7–8).

It remains a central theoretical and empirical dilemma exactly how culture travels from the institutional level to manifest in the people's heads (DiMaggio 1997, p. 272). The transmission process of values through three biologically inspired drivers (Lo 2016, p. 18ff), i.e. authority and leadership (analogous to a primary infection source), composition (analogous to a population at risk) and environment (shaping cultural response), is an attempt to bring light into the dark. Authority and leadership are important as a corporate culture is directed to employees through authority (e.g. tone from the top) with the help of (social) sanctions and incentives. Culture is also composed bottom up. Composition is achieved by hiring, selection practices or population changes, searching for specific values, beliefs and/or individual traits. Environmental factors, as the third driver, also affect culture. Values reflect how a culture manages risk as a change in the environment, from risk identification and assessment to prioritization and finally the response to risk. Concerning the risk assessment process, overconfidence (Kahneman 2011) in corporate cultures plays an important role (Lo 2016, p. 30), linked to cultural blindness to contra-indicators (Linstead et al. 2014, p. 174) and an increased tendency for the tolerability of risk (Goh et al. 2010, p. 69). Culture is a product of the environment; when the latter is changing, so does the culture.

Culture exploring theories explain how (unconscious) cultural knowledge is able to contribute to unanticipated negative outcomes, driven by individuals who violate normative standards by a process in which their own conduct may be seen as conforming even if the actual behaviour in question is objectively deviant. Attribution processes of culturally acceptable terms and/or acceptable social expectations support such a contribution to negative outcomes (Vaughan 1999, pp. 280–281). Vaughan (1990, 1996, 1997, 2004) develops the concept of normalization of deviance in which actions that appear deviant to outsiders are normal and acceptable within a culture, leading to problematic perceptions of acceptable deviance, i.e. to the production of deceptive cultural beliefs in risk acceptability. Bandura (1999) describes the concept of moral disengagement in which psychological processes bias moral awareness

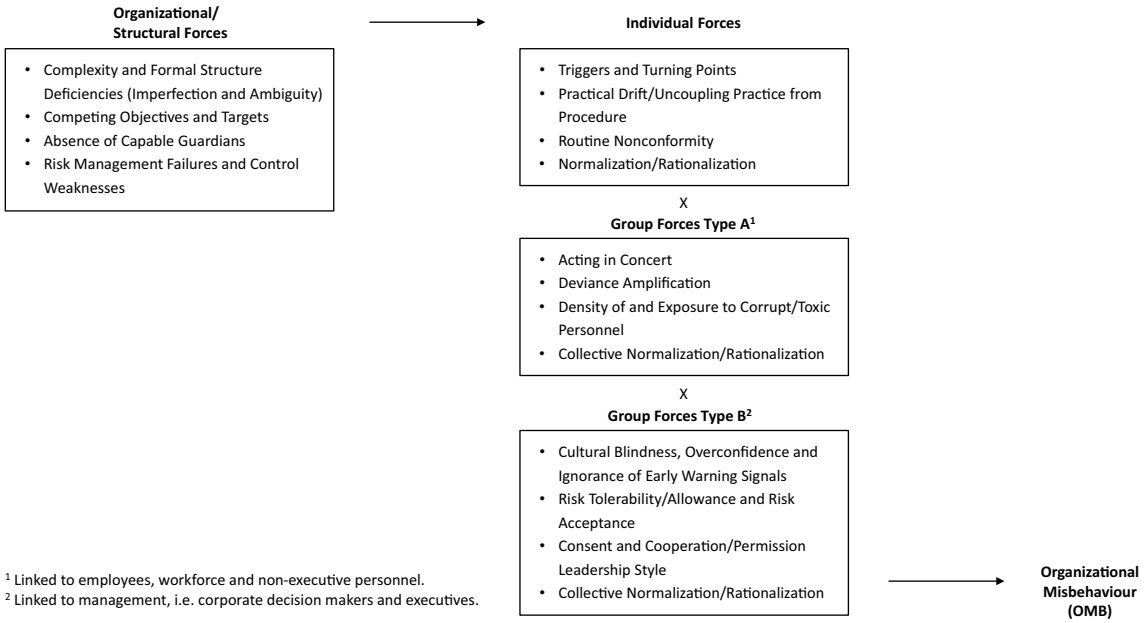

Fig. 1 Organizational/structural, individual and group forces contributing to organizational misbehaviour (OMB)

concerns. De Cremer and Vandekerckhove (2017, p. 442) see moral disengagement as a buffer, allowing individuals to free themselves up from feeling guilty.

Organizations allowing or even expecting members to violate values of the larger society within which they operate will most likely not be successful in the long run (Vardi and Wiener 1996, p. 155). Organizations under attack in competitive environments in turn try to establish themselves almost central to cultural traditions of their societies in order to obtain protection (Meyer and Rowan 1977, p. 348).

Turner and Pidgeon (1997) highlight that cultural collapses or man-made disasters mainly occur due to inaccuracy or inadequacy of accepted norms, values and beliefs. Most often there is an incubation period in which (chains of) discrepant events—typified by rule violations and flanked by overconfidence about hazard, preventing intervention—develop and accumulate over time more or less unnoticed.

Descriptive Model

Treviño (1986) develops a model for unethical managerial decisions that suggests that individuals' and groups' standards of right and wrong are not the sole determinants of their decisions. Instead, these beliefs interact with situational forces. These two factors shape individual and group decisions and behaviour (Sims 1992, 2017). Wikström (2004) and Wikström and Treiber (2009) argue similarly in their situational action theory, describing the interaction between individual decision-making characteristics, e.g. individual's morality and ability to exercise self-control and situational characteristics, e.g. temptations, provocations and moral context.

From a holistic point of view, OB research and its emerging sub-field of OMB explore three different levels: the macro level, analysing organizational form, design and action, the meso level, studying interpersonal work, workgroups and teams, and the micro level, examining the individual and dealing with his or her attitudes and behaviour (Vardi and Weitz 2016).

Our hypothesis of this paper is that the joint occurrence of three forces contributes to the existence of OMB: organizational/structural (causational for situational circumstances), individual as well as group forces. We apply aforementioned OMB theory paradigms in the following descriptive model to the three forces (Fig. 1).

The forces on macro, meso and micro level and their underlying elements are interrelated and influence each other in a dynamic interplay. Organizational/structural forces mark for the organization the basis in which individual acting takes place and in which individual behaviour is influenced by situational circumstances. Collective/group forces—also influenced by organizational forces—further affect individual and group behaviour, which may lead into OMB.

Organizational/Structural Forces

Internal organizational and structural elements (both of formal and informal nature) are the fundament of organizations and externally influenced by, for example, market conditions, business environment and regulation.

Formalization and structural effort will never cover all organizational conditions (Feldmann 1989), which is due to environmental uncertainty and because imperfection and ambiguity—resulting in, for example, competing objectives and targets—are built-in components of complex institutional environments. Sjoberg (1960, p. 210) confirms along the same lines, no logical consistent formal apparatus is existent to fulfil all requirements a system must meet. Therefore, analogous to Merton (1936), secondary consequences, which generate unexpected (e.g. negative/dark) outcomes, are inevitably to emerge to keep a system operating.

Additional situational contributors supporting the occurrence of OMB are the absence of capable guardians and the existence of control weaknesses, both creating favourable opportunities/suitable targets for acting individuals and groups.

Individual Forces

It holds true what Cressey (1953) formulates: the skills necessary for misconduct are the skills that are required to do the job in the first place. Hence, there need to be triggers and turning points for acting individuals for (mis)using their skills counter to their originally intended objective(s).

Additional individual elements are the aforementioned uncoupling of practice from procedure (practical drift) and—in an extreme form—routine nonconformity, thereby intentionally ignoring or circumventing organizational rules.

Neutralization and rationalization routines/techniques allow individuals to reduce or even overcome moral dissonance—hence, dispute consequences of OMB.

Group Forces

The meso level of O(M)B research examines interpersonal behaviour, i.e. behavioural habits, traits and dynamics of individuals working in groups. This covers principle-agent relations alongside the organizational hierarchy/chain of command.

Considering complex/multi-layered organizational hierarchy levels makes it necessary to distinguish between typologies of groups alongside existing principle-agent relations. Acknowledging recent OMB research (Den Nieuwenboer et al. 2017; Grodecki 2018), there is increased interest in the role of middle management in modern corporate fraud, in particular agent liability fraud. Large-scale corporate wrongdoing—including the coordination and control of the same—seems to require buy in and support from middle management, whereby middle management may be coerced into deceitful practices to fulfil performance or conceal poor results. Corporate decision makers and executives may execute pressure on agents underneath them to produce results without inquiry in the agent's methods. Legal/regulatory requirements stipulate that executives are monitored and held accountable for corporate actions, leading to a middle management that is being isolated from legal accountability/liability (Nelson 2016, p. 930).

We therefore distinguish between group forces type A, linked to employees, workforce and non-executive personnel, and type B, linked to management, i.e. corporate decision makers and executives.

Group Forces Type A

Working in groups requires coordination and collaboration between individuals. Setting the focus on OMB, we deem unauthorized acting in concert as one major group force type A for CRT.

Beyond that, related criminological research theorizes deviance amplification effects as important for OMB (Weick 1979; De Cremer and Vandekerckhove 2017, pp. 443–4, who refer to escalation effects), supported by organizational studies that suggest, exposure to corrupt/toxic personnel, showing unethical behaviour, is positively correlated with an individual's unethical behaviour (Housman and Minor 2015) and the influence is positively moderated by group network density, group network closeness centrality and group size (Wang et al. 2017).

Similar to neutralization and rationalization routines on individual level, these are also existing on group level, as initially described and explored by Janis' (1972) groupthink theorem, disputing negative/unwanted results of misbehaviour.

Group Forces Type B

Corporate decision makers and executives who act in an overconfident manner, thereby consciously or unconsciously ignoring early warning indicators for unethical behaviour, create and foster a culture for OMB. This kind of behaviour periodically or constantly accepts negative behaviour/misconduct to occur and persist.

As highlighted before, any changes also of negative norms cannot arise without consent and cooperation—hence require a permission leadership style of corporate executives and decision makers. Similarly to the importance of normalization/rationalization routines on individual and group force type A level, these techniques—when in use by top management—are able to contribute to OMB.

In the following, we apply the descriptive model to three CRT events at National Australia Bank (NAB), JPMorgan, and the interest reference rate manipulation/LIBOR scandal.

Unravelling Collusive Rogue Trading (CRT)

Recent history reveals a series of rogue traders, damaging their employers' assets and reputation. There is an increasing trend of serious cases with substantial financial impact, especially since the beginning of the century, cf. Rafeld et al. (2017a, b), who analyse three major rogue trading cases. Table 1 gives an overview about high-profile rogue trading events in various markets and jurisdictions including a re-occurring typology/profile of the acting rogue traders and instances of collusion.

We now apply the OMB framework to three major CRT events at National Australia Bank (NAB), JPMorgan (JPM) with its London Whale and the interest reference rate manipulation/LIBOR scandal, discussing each of the cases separately and then drawing conclusions.

National Australia Bank (NAB)

In January 2004, National Australia Bank (NAB), one of the four largest banks in Australia and amongst the top fifty financial institutions worldwide measured by total assets as at end of 2017, announced a loss of Australian Dollar (AUD) 360 m (USD 326 m) in its foreign exchange (FX) business. The loss was a result of unauthorized trading activities, i.e. behaviour contrary to NAB's trading strategy.

Four traders, David Bullen, Luke Duffy, Vince Ficarra and Gianni Gray ('the traders'), were responsible for the losses. Bullen, Ficarra and Gray were reporting into Duffy, who in turn reported into Gary Dillon (NAB's Joint Head of FX). The traders' unauthorized activities started in 2001 with an artificially overstated currency option portfolio of AUD 4 m at September 30, AUD 8 m at September 30, 2002 and AUD 42 m at September 30, 2003. During Q4 2003, the traders' unauthorized trading activities significantly increased NAB's risk exposure and corresponding trading losses they needed to mask. The traders acted in the expectation that the USD decline occurred mid of 2002 would reverse and volatility would stabilize, while USD actually dropped another 10% against AUD in the last quarter of 2003. The overstated value of the portfolio amounted to AUD 92 m at the end of December 2003. In the morning of Friday, January 9, 2004, a junior member of the currency option desk blew the whistle and raised concerns with another desk employee about potential substantial losses in the FX portfolio. NAB's senior management was informed on January 12, 2004. The bank suspended the four traders on January 13, 2004 (see Turnbull 2008, pp. 85–6 for a chronological overview). Once the unauthorized open positions were detected, NAB estimated a total loss of AUD 180 m. The final amount, after adjusting for a revaluation of the portfolio, was set at AUD 360 m.

Table 2 summarizes modus operandi, risk management failures and control weaknesses as well as early warning signals of NAB's CRT event.

Bullen et al. pleaded guilty in June 2006 and were sent to jail with imprisonment ranging from 16 to 44 months (Dellaportas et al. 2007, p. 14; see also Table 1). NAB was required to shut down the currency option desk for 15 months. NAB's CEO Frank Cicutto was replaced by John Steward.

Organizational/Structural Forces

Bullen, Duffy, Ficarra and Gray were executing their own trading strategy, focussing on excessive proprietary risk-taking trading activities including a high level of interbank counterparty transactions, which was against the formalized trading strategy of the Australian bank to focus on corporate customer business. Despite the traders' unauthorized trading activities, masking their unauthorized open positions, it reflects though an inherent dilemma: risk-taking is an integral part of banking and its objective to generate/maximize profit. The spirit of investment banking in particular can be characterized as entrepreneurial, as investment banks are established to take on high(er) ratios of risk, which carry upside/profit opportunities but also significant damage/loss potential. The relative autonomy of traders, taking into account the (by nature) high capital they are authorized to handle as agents executing directives on behalf of their employers requires them to act within risk limits set by the banks on the one hand but also exploring and testing boundaries of the same on the other. Extending the allowed and pushing the limits seems to be common in banking, all under the ultimate objective of maximizing profitability (Drummond 2003, p. 93f). Insofar, the act of balancing risk and reward is connected to competing objectives. At NAB in particular, profit was king—according to Cooke (1991) and Treviño and Nelson (1999) a phrase denoting dedication to short-term revenues against long-term considerations, which creates a climate of unethical behaviour—pushing the boundaries on risk in pursuit of revenue targets (PricewaterhouseCoopers 2004, pp. 23, 26). Segregation of duties were insufficiently implemented, role definitions for risk managers were ambiguous,[2] acting as 'business partners', assisting business units to develop new business versus fulfilling an active and independent policing role and risk management function (Australian Prudential Regulation Authority

[2] Angeletti (2017) investigates the first LIBOR trial involving Thomas Hayes and provides a sociological framework to capture justifications of financial wrongdoings. He finds in most situations (e.g. pleas in court) the multiplicity of rules (i.e. ambiguity) to be used by elites, as users of the rules (versus rule makers and rule interpreters), to their own benefit.

Table 2 Modus operandi, risk management failures and control weaknesses and early warning signals of National Australia Bank's collusive rogue trading (CRT) event

Modus Operandi of David Bullen, Luke Duffy, Vince Ficarra and Gianni Gray ('the traders')	Risk management failures and control weaknesses	Early warning signals
Trading activities contrary to NAB's strategy • In 2003, the traders' excessive risk-taking propriety trading activities significantly grew up, including a high level of interbank counterparty transactions with high nominal trade values, which was against NAB's intended trading strategy to focus on corporate customer business • Dealing decisions in Q4 2003[a] resulted in large long USD positions, affected by major decline (10% drop) of the USD versus AUD end of 2003 Collusive misstatement of losses (in some cases profits) with the help of false/fictitious transactions, masking true exposure/concealing actual losses (i) Usage of deliberate incorrect dealing rates for genuine transactions, allowing the traders to shift losses from one day (or period) to another ('smoothing'); activity included trading system (Horizon) password sharing amongst the traders (ii) Processing of false one-sided spot foreign exchange transactions with subsequent cancellation/surrendering; transaction rates were off market, resulting in immediate profit from end-of-day revaluation process (467 transactions detected during 2003[a]) (iii) Entering of undetected one-sided internal currency option transactions with subsequent cancellation/surrendering; transaction rates were off market, resulting in immediate profit from end-of-day revaluation process (78 transactions detected during Q4 2003[a]) (iv) Revaluation of the currency option portfolio using incorrect rates (for period from July 1998 onwards); at least two of the NAB traders prepared schedules containing false revaluation rates, which were emailed to two external market data suppliers/brokers officially used by NAB (until end of 2002; from then, only one broker remained)—false rates were 'officially' emailed back to NAB without any amendments by one particular person at the remaining broker (indication for collusion) Related to (i), (ii) and (iii) from above, misuse of end-of-day closure procedure ('one-hour window') • Traders entered false transactions into Horizon right before end-of-day closure (at approx. 0800 h am the next morning, which was the basis for profit and loss (P&L) capturing in NAB's general ledger (Kapiti reconciliation) • Operations started checking the transactions at about 0900 h am—within the arising one-hour time frame, the traders were able to amend incorrect deal rates and to reverse false transactions, bypassing deal checking processes carried out by Operations • Process had to be redone each day, losses were rolled forward; the traders discovered the 'one-hour window' by accident in 2000 Exceeding risk limits • Continuous breaches of risk limits (incl. VaR[b] and the five 'greek' risk measures, i.e. delta, gamma, rho, vega and theta) throughout 2003; significant increase during Q4 2003[a] and in January 2004 • Subsequent approval on a routine/daily basis by the traders'/the desk's supervisor (Dillon, responsible for seven individuals including the four traders) without rigorous investigation by him Cover the tracks • Forensic analysis revealed that one of the traders attempted to delete over 14000 emails (on January 13, 2014 at 0630 h am) • All emails were successfully recovered and reviewed during the investigations by PricewaterhouseCoopers and the Australian Prudential Regulation Authority (APRA)	Lack of adequate supervision, coupled with overconfidence • Against their trader mandate, the traders took large, complex and risky positions • Supervision was limited to headline profit and loss monitoring; less attention was devoted to size, nature and inherent risks of transactions • NAB's management had a tendency to 'pass on' rather than assume responsibility and 'push the boundary' on risk versus revenues ('profit is king') Failed and lax risk management • Flaws in the design, implementation and execution of risk management as well as failure to fulfil effective policing role • Market Risk and Prudential Control (MR&PC) knew about and reported but finally failed to escalate persistent risk limit breaches one or more levels above the respective Global Head, i.e. the traders' supervisor (Dillon) Lack of confidence in VaR[b] • Questions over the ability of NAB's disparate risk systems and quality of data used in the VaR calculation • No sense of urgency resolving VaR calculation issues which were apparent for 3 years • NAB's managements' confidence was undermined to the point in which VaR limit breaches were effectively ignored for a period of 2 years Absence of financial controls • Insufficient procedures to identify, investigate and explain unusual or suspicious transactions • Profit review was completed on desk and not on product or deal basis, no P&L explain process in place; materiality thresholds set were ineffective (too high) • No independent price verification (IPV) process in place • Month-end processes lacked adequate cut-off procedures and did not restate results to adjust for cancelled, corrected or amended (surrendered) transactions (C/C/A) Gaps in back office procedures • Failure to detect false transactions and/or loopholes in the processes such as the 'one-hour window' • From October 10, 2003 onwards, back office—equipped with in total 138 employees, of which 4 (3%) were responsible for NAB's currency option desk—stopped checking internal option transactions under the (wrong) assumption these were automatically matched/no checking for offsetting internal (equal or opposite) deals was necessary—related to false/fictitious transaction type (iii) Weakness internal governance procedures • NAB's Principle Board not was sufficiently proactive on risk issues; the Board paid insufficient attention to risk issues until the establishment of a separate Risk Committee • Executive Risk Committees were particularly ineffective, missing or dismissing risk information pertinent to the problems, which emerged (acceptance of continuous limit breaches, ignoring VaR due to lack of confidence and no checking for trader mandate breaches) and failed to escalate warnings • Minutes from the Board meeting mid of December 2003 state '*The Board noted that traders work within tight limit structures*'—an entirely inaccurate and misleading presentation	External warning • In March 2002, another Australian bank (not named in both investigation reports) raised concerns about the size and risk profile of NAB's transactions; concerns were passed off by NAB, as the bank did not understand NAB's trading strategy and pricing model • A report from the then acting Head of Internal Audit of NAB's Corporate and Institutional Bank (CIB) from May 2002 on lessons learned from foreign exchange option losses of USD 691 m—due to unauthorized trading by John Rusnak—suffered by Allied Irish Bank (AIB) as well as a market risk review letter from the Australian Prudential Regulation Authority, received by NAB in January 2003, highlighted a series of existing control breakdowns relating to NAB's VaR calculation and limit breaches (NAB's then chairman Charles Allen has not shared the Australian Prudential Regulation Authority's full report with the Board) • KPMG, NAB's external auditor, issued a number of findings (in three reports) related to foreign exchange trading processes from audits conducted 2001 until 2003; one draft management letter to NAB from December 2003 highlights 'systemic issues' concerning the breach frequency of limits Internal warning • Internal Audit reported significant currency option issues in five reports, issued between May 1999 and January 2003, but failed to follow up and ensure appropriate controls and procedure changes were implemented Risk limit breaches • Daily VaR limit of the currency option desk (AUD 3.25 m)[b] was breached three times during September 2003 • Limit breaches amounted to 866 during October 2003 • NAB's global VaR reached a level of AUD 100m[b], of which the currency option desk's VaR amounted to AUD 40 m (more than twelve times the limit itself, i.e. AUD 3.25 m) end of December 2003 Large and unusual activity • The traders entered into a number of large and unusual transactions, i.e. deep-in-the-money options (bearing a delta close to 1)[c]; NAB's currency option desk sold two of these options for a total premium of USD 322 m on October 9 and 10, 2003 • Concerns from Market Risk and Prudential Control (MR&PC) about unusual high premium earnings were passed off by NAB's management without proper investigation Breaches of new product approval (NPA) process[d] • Although MR&PC did escalate NPA breaches (unapproved products), NAB's trading business still entered into numerous new transactions with relative impunity • New products were retrospectively signed off (i.e. after their first trading date), often for the purpose of formalizing existing breaches

Table 2 (continued)

Source Authors' representation, based on Australian Prudential Regulation Authority (2004) and PricewaterhouseCoopers (2004)

[a]NAB has a financial reporting year, which ends at September 30. The vast majority of false/fictitious transactions was captured by the traders from October 1 until end of December 2003

[b]NAB's global VaR limit was set at AUD 80 m; this was reduced to AUD 50 m on January 26, 2004 in response to the trading losses

[c]The deeper an option is in-the-money, the closer the delta will be to 1 and the more the option will behave like the underlying asset. It is unusual for corporate clients to purchase this kind of options due to the high(er) premium cost

[d]In NAB's terminology, Product Usage Authority (PUA) breaches

2004, p. 6). NAB's internal control and risk systems were lax, equipped without financial controls and failed at every level to detect and shut down the irregular currency option trading activities.

Individual Forces

There were two triggers for the four traders: first, their discovery (by accident) of the one-hour-window in 2000 (more than two and a half years before they went rogue), which enabled them to 'correct' their incorrect deal rates and reverse false transactions. Second, the 10% drop of USD against AUD in the last quarter of 2003 coupled with the large long USD positions of the traders, which generated accumulating losses in a short period. Both triggers led to the fact that Bullen, Duffy, Ficarra and Gray were not following NAB's trading strategy (uncoupling practice from procedure), resulting in 545 unauthorized trades and 866 risk limit breaches (routine nonconformity; Dellaportas et al. (2007, p. 13) highlight how using the one-hour-window eventually became 'routine morning behaviour') during Q4 2003. The traders' behaviour confirms Rafeld et al.'s (2017b) 'inability to accept losses paradigm' for rogue traders. NAB's 'profit is king' culture—as organizational/structural force—also influenced the traders' individual behaviour. The bank's management appeared to create an environment for fraudulent behaviour to flourish (Dellaportas et al. 2007, p. 17; PricewaterhouseCoopers 2004, pp. 4, 32). We deem NAB's culture as main—and quasi-immanent—normalization element for the traders, rationalizing their unauthorized trading activities.

Group Forces Type A

Dillon (NAB's Joint Head of FX) was hiring two ex-colleagues from Commonwealth Bank (Duffy and Gray) by circumventing NAB's formal recruiting process—no external reference checks were conducted when hiring his former colleagues (Australian Prudential Regulation Authority 2004, p. 76). Working with colleagues he knew and he could rely on was important when acting unauthorized in concert, supporting the argument of a negative influence for individuals because of the exposure to corrupt/toxic personnel. As the market turned against the four traders and rather than closing their loss making positions (inability to accept losses), they intensified their trading activities. In retrospect, we interpret such trading behaviour as 'doubling down' on an already loss-making trading strategy, increasing bets after each loss (amplification/escalation effects), which is typical for rogue traders like Nick Leeson at Barings Banks (in full analytical detail Brown and Steenbeck 2001). NAB's profit culture, with risk management being embedded in the business, which was more a matter of form than one of

substance (Australian Prudential Regulation Authority 2004, pp. 72–3), facilitated the traders' collusive behaviour and provided collective normalization opportunities for them.

Group Forces Type B

Many early warning signals existed for NAB's CRT event, i.e. external warnings but also internal signals (see Table 2), to detect and close down the irregular currency option trades. However, there was no reaction by the Australian bank, reflecting NAB's overconfidence but also the bank's risk tolerability for excessive risk-taking behaviour. Some of the fictitious trades were on NAB's desk systems for extended periods and could have been detected earlier, echoing cultural blindness and the permission leadership style at NAB. In the context of normalizing behaviour, management's supervision was limited to headline profit and on pushing the boundaries on risk versus revenues ('profit is king').

JPMorgan's London Whale

JPMorgan Chase & Co., JPM hereafter, is globally the largest participant in the credit derivatives market. In November 2006, a New Business Initiative (NBI) was approved by JPM to trade in synthetic credit derivatives. In early 2007, JPM's Chief Investment Office (CIO) launched its Synthetic Credit Portfolio (SCP), bundling all credit trading activities/the trading of credit default swaps (CDS). Primary interest of the SCP creation was to protect the firm from adverse credit scenarios such as widened credit spreads and/or corporate defaults, as JPM, like other lenders, is structurally long credit, requiring default hedging.

The SCP and the related traders on the desk were managed by Javier Martin-Artajo. One other trader was Bruno Iksil. During his time with JPM, Iksil earned his nickname 'London Whale'. Iksil worked closely with a junior trader, Julien Grout. Martin-Artajo was reporting into Achilles Macris (Head of CIO London), who reported into Ina Drew (Global Head of CIO). Drew had a reporting line into JPM's CEO, James Dimon.

Similar to NAB's CRT event and a substantially worsened situation in Q4 2003, JPM's trading activities at the SCP desk spiralled out of control also during one quarter, Q1 2012. Mid of January 2012, the SCP suffered a loss of USD 50 m because of the bankruptcy of Eastman Kodak defaulting on its debt (JPMorgan Chase & Co. 2013, p. 30; Kregel 2013, p. 7). As a result, CIO management requested the SCP traders to have appropriate jump to default protection (risk coverage for sudden credit defaults) in place. Iksil and Grout bought sizeable CDS positions/credit protection on high yield indices.

End of January 2012, CIO announced a changed trading strategy that contained several conflicting objectives and at the end incompatible goals mandated by different levels of management (Kregel 2013, pp. 5, 7 and supportive McConnell 2014b, p. 78). With no clear instruction in which direction to trade and rather than unwinding positions to reduce portfolio size, Risk Weighted Assets (RWA) and incurring losses, Iksil and Grout substantially expanded SCP's overall notional size and its long positions during February and March 2012. Their trades resulted in an accumulated position volume of USD 157 bn at the end of March 2012 (vs USD 51 bn end of December 2011). Table 3 illustrates the significant market share in Q1 of 2012, which enabled the traders to move the market price closer to SCP's marks (Financial Conduct Authority 2013b, pp. 2, 23–6).

A group of hedge funds became aware of the size of positions held by the SCP and decided to trade against JPM (Skyrm 2014b, p. 19).[3] Figure 2 shows the actual mark-to-market losses of the SCP over the first 18 weeks of 2012.

Iksil and Grout were hiding accumulating losses by deliberately mismarking their positions (Financial Conduct Authority 2013b, p. 3). Table 4 summarizes modus operandi, risk management failures and control weaknesses as well as early warning signals of JPM's CRT event.

For not having the internal CDS speculation under control, deliberately mischaracterising SCP's problems and misinforming its investors, regulators[4] and the public, two penalties—one of GBP 137.6 m from the Financial Conduct Authority (2013b, p. 58) and one of USD 920 m from the United States Securities and Exchange Commission (2013)[5]—were raised against JPM. The firm suffered a total loss from unwinding SCP's positions of USD 6.2 bn. Two rating agencies downgraded JPM because of the London Whale event (Standard & Poor's revised its outlook on the firm from stable to negative and Fitch Ratings downgraded it from AA− to A+). Lastly, JPM suffered a loss in market

[3] A former JPM trader, Toby Maitland Hudson, responsible for proprietary trading of derivatives tied to commercial-mortgage bonds at JPM, was hired by Saba Capital Management, L.P., a hedge fund founded in 2009 which supposedly profited from Maitland Hudson's knowledge of SCP's positions.

[4] For almost six years, JPM failed to disclose any information about its SCP to its primary regulator, the Office of the Comptroller of the Currency (OCC). Only from January 2012 onwards, when the SCP began breaching JPM's Value-At-Risk (VaR) limit and losses occurred, JPM reported the SCP to the OCC. OCC's repeated information requests were often ignored and not adequately enforced by JPM, resulting in incomplete, inaccurate and misleading information (United States Senate 2013c, p. 250).

[5] JPM needed to pay a civil penalty to the United States Securities and Exchange Commission (SEC). The firm did not admit liability or even any mistakes (Bealing and Pitingolo 2015, p. 7). Linked research reveals, it is cheaper for financial institutions to settle with the SEC in order to avoid further opprobrium versus trying to attempt to convince the court of the appropriateness of remediation actions taken (Patton 2014, pp. 1719, 1738).

Table 3 Trading volume and market share by traded product of JPMorgan's Chief Investment Office beginning of 2012

Credit Default Swap (CDS) Index Tranche[a]	Maturity (years)	Chief Investment Office (CIO): CDS Index Tranche notional traded (USD m) and share (% market)				
		Jan	Feb	Mar	Apr	Total
iTraxx Europe Series 9	7	993	4752	775	487.5	7007
		16%	49%	9%	10%	23%
	10	11769	7245	6601	338.8	25,954
		44%	48%	48%	6%	42%
iTraxx Europe Series 16	5	26,440	36,360	26,075	25	88,900
		13%	17%	13%	0.2%	14%
CDX.NA.IG.9	7	7092	8387	2017	256	17,752
		13%	17%	5%	1%	10%
	10	28,528	20,032	9820	667	59,057
		34%	42%	14%	2%	25%

Source Authors' representation, based on United States Senate (2013b, pp. 1504–5)

[a]Each tranche references a different segment of the loss distribution of the underlying index. The equity tranche (lowest) absorbs the first losses on the index due to defaults up to a maximum of 3% of the total index, receiving the highest coupon. The following tranches are Mezzanine (absorbing 3–7%) and senior and super-senior tranches, which have the smallest coupon

capitalization of 25% in the weeks following the loss disclosure in JPM's May 10-Q filing, mirroring a substantial reduction of trust and investor confidence.

After being dismissed by JPM, the SEC agreed not to pursue Iksil for his cooperation as witness (United States Securities and Exchange Commission 2013; Abdel-Khalik 2014, p. 65). Beginning of February 2016, the Financial Conduct Authority (FCA) fined Macris (Head of CIO London) with GBP 793 k for failing to inform about concerns and not disclosing mounting losses from the London Whale trades to regulatory authorities. Martin-Artajo and Grout were accused of fraudulently overvaluing investments in order to hide accumulating losses in the portfolio they managed. End of July 2017, the U.S. Department of Justice (DoJ) announced it was dropping the prosecution of Martin-Artajo and Grout because Iksil was no longer a reliable witness (Martin-Artajo's and Grout's home countries, Spain and France, were also not agreeing on the extradition of both former SCP traders to the US). Iksil created a website (londonwhalemarionet.monsite-orange.fr) explaining his view of the course of events, which is different to testimonies he gave to the U.S. authorities (Henning 2017).

Organizational/Structural Forces

JPM's New Business Initiative (NBI) represented the initiation of a formal structure with the design, review and approval of a new product, endorsing product, market(ing), client and trading specifications. Overarching from a risk management perspective, the formal structure was enriched by another formal layer, the set risk appetite for JPM's CIO, ratifying the application of rigorous controls over cash and security movements and focussing attention on ensuring

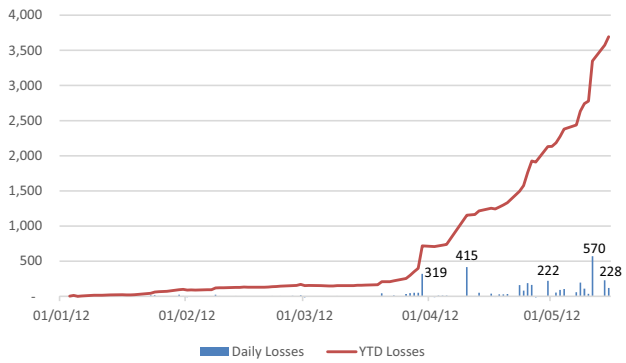

Fig. 2 Daily and year-to-date losses of JP Morgan's Synthetic Credit Portfolio the first half 2012 (in USD m). *Source* Authors' representation, based on United States Senate (2013a, p. 281)

compliance with regulatory requirements including the Volcker Rule (United States Senate 2013b, p. 1875). SCP's revised trading strategy from January 2012—one of SCP's main formal structure elements, which should have reflected SCP's actual hedging/risk protection mandate—mirrored conflicting objectives and incompatible goals. Further, massive risk management failures of managerial direction and control indicate the absence of capable guardians (supportive Kregel 2013, pp. 4–5; see also Table 4).

Individual Forces

The conflicting mandate, due to the revised trading strategy, and rapid accumulation of losses early 2012 need to be seen as turning points for the traders' behaviour at JPM, the starting point for nonconformity and finally misconduct throughout the first quarter of 2012. SCP's nominal size

Table 4 Modus operandi, risk management failures and control weaknesses and early warning signals of JPMorgan's London Whale event

Modus Operandi of Javier Martin-Artajo, Bruno Iksil and Julien Grout	Risk management failures and control weaknesses	Early warning signals
Mismarking of positions • Subversion of month-end valuation control processes • Migration of SCP's marks from mid-point spread to more aggressive end of the bid-ask spread[a] • Providing of estimates of what the SCP traders thought the positions were worth after receiving instructions to mismark the portfolio to conceal losses Market misconduct • SCPs' traders traded significant quantities of protection (see Table 3) • Size and timing of SCP's trading affected market movements and pricing levels	Flawed trading strategy • Trading strategy contained several conflicting objectives and incompatible goals mandated by different levels of management • Trading strategy was not properly monitored, leading to failed appreciation of magnitude and significance of the changes made to the SCP Valuation control flaws • CIO Valuation Control Group (VCG)'s processes were flawed and could be easily subverted; no robust reporting protocols and no daily trading activity reports were existent • VCG was under-resourced, including absence of adequate supervision; its written policies were not consistently implemented • VCG did not had any documentation for the price-testing of thresholds; no formal training (& documentation) was provided to the traders how to mark the SCP Revision of Value-at-Risk (VaR) model[b] • VaR calculation was dependent on manual processes and contained significant errors • Newly implemented VaR model reduced SCP's VaR by 40% to USD 66 m, understating the existing risks; VaR model change did not trigger any reduction of VaR limits Limit setting and monitoring • Insufficient review of the appropriateness of CIO's risk limits; CIO's risk limits were not reviewed between 2009 and 2011 • Risk limits were not sufficiently granular, i.e. were applied to CIO as a whole only; there were no limits by size, asset type or risk factor specific to the SCP Control function weaknesses and missing involvement/escalation • CIO risk: IT infrastructure and personnel shortcomings (understaffing and lack of requisite skills); Risk Committee met infrequently, i.e. three times during 2011—no personnel outside of CIO attended the Risk Committee • Finance: failed to have asked more questions and to have sought for additional information about the evolution of the portfolio • JPM senior management did not inform Compliance London until May 10, 2012 about irregularities in the SCP; JPM's Audit Committee was not timely informed	Internal audit reports on CIO's credit control structure • CIO did not measure the portfolio's sensitivity to applicable risk measures • CIO Valuation Control Group's (VCG) thresholds were not formally documented or consistently applied Disregarding external warning signals • Wall Street Journal (WSJ) publication, raising indications about excessive position volumes close to reality; publication and unmasking of Iksil's name in connection to the vast Credit Default Swap (CDS) positions in the market • Adverse actions by JPM's competitors (hedge funds) Limit breaches • Mid of January 2012, CIO exceeded its own VaR Limit and contributed to a breach of the firm wide VaR limit for 3 days • Including VaR, there were 330 limit breaches from Q4 2011 until April 2012 Questionable VaR model validity[b] • Overall output of the new VaR model was nearly halved • Delta between old and new model was greater than the VaR limit itself Taped line monitoring • Compliance London listened to a suspicious call between SCP's traders and SCP management, offering early indications about market misconduct and mismarking of positions; no remediation actions were taken

Source Authors' representation, based on Financial Conduct Authority (2013b), JPMorgan Chase & Co. (2013) and United States Senate (2013a, b, c)

[a]PricewaterhouseCoopers LLP, JPM's outside/external auditor, concluded in its review, SCP's position marks as at March 31, 2012 complied with the Unites States Generally Accepted Accounting Principles (U.S. GAAP) (JPMorgan Chase & Co. 2013, p. 6)

[b]At peak time, JPM's VaR of SCP's position volume was estimated at around USD 500 m, whereas the progressive liquidation of the portfolio created losses of USD 6.2 bn (Cont and Wagalath 2015, p. 5). In order to better anticipate effects from unusual liquidation processes, e.g. fire sales after the detection of unauthorized open positions created by (collusive) rogue traders, Cont and Wagalath (2015) propose a portfolio risk model, which integrates market risk with liquidation cost, i.e. the creation of liquidation-adjusted risk measures such as liquidation-adjusted VaR

increased tenfold to USD 51 bn at the end of 2011. As a consequence, Dimon instructed Drew to reduce CIO's Risk Weighted Assets (RWA), for which the traders proposed to reduce RWA by in part manipulating JPM's Value-At-Risk (VaR) model to artificially lowered SCP's risk results, leading to an overnight CIO VaR reduction of 44% to USD 66 m (United States Senate 2013b, p. 519).[6] This reduction did not result in a corresponding decrease of CIO's VaR limit (McConnell 2014b, pp. 82–3); hence, the traders could take on greater risk without being in breach of their limits (Financial Conduct Authority 2013b, p. 17). Iksil's and Grout's behaviour was far more than a practical drift but rather in an intentional routine nonconformity mode. Several rationalization attempts were made by SCP's traders regarding their incurring losses.

Group Forces Type A

As losses from the CDS positions began to grow—driven by the USD 50 m loss due to the Eastman Kodak's bankruptcy—Iksil, supported by Grout, started to deliberately mismark SCP's values to minimize disclosed losses by instruction from senior management, in line with a tripled SCP notional size of USD 157 bn (Financial Conduct Authority 2013b, pp. 3, 22). The SCP's traders' dealing in substantial quantities of protection (see Table 3) affected credit market movements and pricing levels worldwide, resulting in collective market manipulation/acting in concert in favour of the SCP. SCP's trading completely spiralled out of control, as during two weeks mid of March 2012, SCP's traders acquired additional USD 40 bn long credit derivative positions (deviance amplification/escalation). The acceptance of the traders' activities by SCP and CIO management provided a fertile ground and, at the same time, a collective rationalization for the traders' CRT.

Group Forces Type B

JPM's continuous ignorance of early warning signals echoes JPM's cultural blindness and overconfidence. The same mounted further in rationalization attempts, with the public denial of loss by JPM's CEO, James Dimon, during an earnings call on April 13, 2012, '*It's a complete tempest in a teapot. Every bank has a major portfolio. In those portfolios, you make investments that you think are wise that offset your exposures. Obviously, it's a big portfolio (…) It's sophisticated, well, obviously, a complex thing*.' (United States Senate 2013c, p. 258). Dimon's statement supports the normalization of deviance argument (Vaughan 1990, 1996, 1997, 2004). Dimon has been continuously criticized for the statement—a severe mischaracterisation of the actual situation—also grossly underestimating the public reaction. One year later, Dimon showed repentance and acknowledged the seriousness of the London Whale event (Sale and Morgan 2014). The outlined course of actions offers insights into the tolerability/allowance and acceptance mechanisms of risk at JPM. Towards end of January 2012, Iksil and Grout were already losing money in a nearly uncontrollable way (United States Senate 2013c, p. 177). Both estimated and communicated end of January 2012 a year-to-date portfolio loss of close to USD 100 m and were expecting another increase by USD 300 m as possible scenario. No immediate corrective actions by SCP's or CIO's management took place at that point in time until Drew finally requested Iksil and Grout to stop trading eight weeks later on March 23, 2012. Not only the amounting losses were known (despite only vaguely estimated by SCP's traders) to management. The loss concealing and mismarking activities were accepted and tolerated by management, supporting the described consent and cooperation principle and a permission leadership style by JPM.

The Interest Reference Rate Manipulation/LIBOR Scandal

The London Interbank Offered Rate (LIBOR) is regarded as the most important and most frequently used interest reference rate for a number of currencies. A large proportion of money market products, consumer-lending products and other financial instruments rely on LIBOR. Despite the LIBOR scandal, financial contracts continue to be referenced to LIBOR rates.[7]

With its first publication in January 1986 and until end of January 2014, LIBOR was administered by the British Bankers' Association (BBA),[8] applying the following definition

[6] The VaR measures the expected loss of a trading book, while the Risk Weighted Assets (RWA) are a regulatory measure of a bank's exposure.

[7] In addition to LIBOR, there are other reference rates, such as EURIBOR and Euroyen TIBOR. EURIBOR (Euro Interbank Offered Rate) is defined by the European Banking Federation (EBF) as the rate at which Euro interbank term deposits are offered by one prime bank to another within the Economic and Monetary Unit of the European Union (EU) at 11:00 London time. Euroyen TIBOR (Tokyo Interbank Offered Rate), as per the Japanese Bankers Association (JBA)'s instructions, is the reference rate, of which the panel banks believe a prime bank would transact in the Japanese offshore market at 11:00 Tokyo time. For both reference rates, the trimmed mean methodology applies. For the purpose of this paper, the terminology LIBOR is used to cover all similar benchmarks, including EURIBOR and TIBOR.

[8] The BBA is a U.K. non-profit trade organization funded by subscriptions from its more than 200 voluntary members for which it lobbies (Konchar 2014). The BBA merged with Payments U.K., the Council of Mortgage Lenders, the U.K. Cards Association and the Asset Based Finance Association into U.K. Finance on July 1, 2017.

(since 1998), '*The rate at which an individual contributor panel bank could borrow funds, were it to do so by asking for and then accepting interbank offers in reasonable market size, just prior to 11:00 London time*'.[9] At the time of the scandal, LIBOR rates were published for 10 currencies and 15 maturities, ranging from overnight to 12 months, by reference to the assessment of the interbank market by a number of panel banks (8 to 16, depending on the currency in question) selected by the BBA based on market volume, reputation and assumed knowledge of the currency concerned. Every business day, each panel bank submitted its rates to Thomson Reuters, a data vendor licensed by the BBA. Thomson Reuters excluded the top and bottom quartile of the rates submitted, calculated the average of the remaining rates for each currency and tenor (trimmed mean methodology) and published the final rates daily at 11:30 London time.

First indications about possible irregularities in the interest reference rate submission occurred in April and May 2008 when the Wall Street Journal (WSJ) published two articles suggesting some LIBOR panel banks might have contributed with too low submissions compared to their CDS prices to mislead the market about their financial positions and creditworthiness (Mollenkamp 2008; Mollenkamp and Whitehouse 2008). Snider and Youle (2010) highlight a different reason for low submissions, banks sought to make substantial profits on their portfolios linked to LIBOR. Abrantes-Metz et al. (2012) find anomalous individual quotes but no evidence for material manipulation of the USD 1-month LIBOR rate. Monticini and Thornton (2013) provide evidence for periods in which LIBOR and EURIBOR rates diverged from equivalent-term marketable certificates of deposits, followed by Fouquau and Spieser (2015), who identify threshold dates in the time series of LIBOR rate proposals.

In the course of more than thirty investigations by regulatory authorities, severe misconduct, i.e. strategic manipulation of the interest reference rate submission, was identified at several financial institutions. A former Japanese yen trader, Thomas Hayes, working at Royal Bank of Scotland, Royal Bank of Canada, UBS and finally Citigroup, was identified as a ringleader of the interest reference rate manipulation. Hayes built up and maintained an extensive network (analogous to Enrich's 2017 recent anecdotal illustrations on the case, i.e. Hayes' 'spider network'), through which he orchestrated reference rate submitters—primarily related to JPY LIBOR and European TIBOR—at his employers UBS and Citigroup, other panel banks' traders and submitters as well as third party providers (interdealer/cash brokers; for a detailed analysis of the misbehaviour by brokers in the LIBOR scandal see McConnell 2014a) in order to favourably influence his own open trading positions.

Using Hayes as ringleader and publicly available investigation reports about UBS's role in the interest reference rate manipulation, the following schematic interaction model illustrates involved parties and the interpersonal mechanics of the collusion process.

Table 5 summarizes modus operandi, risk management failures and control weaknesses as well as early warning signals of the interest reference rate manipulation from an UBS perspective.

In 2012, Barclays Bank became the first bank to settle with U.S. and U.K. regulators for its role in the LIBOR scandal and paid GBP 230 m in fines. At the time of writing, supervisory, criminal and/or anti-trust authorities fined thirteen banks (including two brokers) for misconduct and inappropriate practices related to the interest reference rate submission.

Prosecution authorities in the U.K. and the U.S. charged at least 23 individuals in LIBOR investigations, of which eight former traders finally were imprisoned at the time of writing. Hayes became the first individual to be convicted for rigging LIBOR in 2015. He was sentenced to 14 years in prison, which was later reduced to 11 years (Angeletti 2017, pp. 119, 121). Five former traders from Barclays Bank, i.e. Jay Merchant, Alex Pabon, Jonathan Mathew, Philippe Moryoussef and Peter Johnson, one former trader from Deutsche Bank (Christian Bittar) and one trader from Rabobank (Paul Thompson) were also jailed for LIBOR manipulation.[10] Eight additional traders are waiting for their proceedings.

Ten trader cases were tossed out, also—analogous to JPM's London Whale and the release of Martin-Artajo and Grout—because of doubts on the reliability of testimony from principal witnesses[11] as well as the grey areas of LIBOR and the opening it provided for manipulation (Ashton and Christophers 2015, p. 207; Bryan and Rafferty 2016, p. 73).

The low number of individuals imprisoned compared to the list of released/acquitted traders and the level of regulatory fines imposed on their employing institutions (see Table 6) reveals the difficulty faced by prosecution

[9] See https://web.archive.org/web/20101013074550/http://www.bbalibor.com/bbalibor-explained/the-basics.

[10] Two former Deutsche Bank traders, Matthew Connolly and Gavin Black, the imprisonment (and potential fine) have not been set at the time of writing.

[11] Many countries, especially in Europe, require providing testimony by individuals involved in an investigation. In light of cross-border convictions, the U.S. law prevents the use of compelled testimony, which makes it difficult for federal prosecutors to pursue charges for cases reaching cross-markets and individuals who are outside the U.S. (Henning 2017).

authorities when seeking to hold individuals responsible for misconduct by global financial companies (Eisinger 2017; Henning 2017), resulting in less personal accountability for corporate wrongdoing (supportive Pontel et al. 2014).

Organizational/Structural Forces

As per BBA's definition, the panel banks' submissions were not averages of their actual transactions or actual interest rates paid/charged. Each LIBOR index was an estimate and represented at the end an array of calculative practices, which was subjective to the core (Ashton and Christophers 2015, p. 193). According to Bryan and Rafferty (2016, p. 73), the credibility of LIBOR required the subjectivity of the reference rate determination—as embodied subjective opinions of expert bankers—to be incorporated into an objective measurement via LIBOR's reputation. The submissions required human judgement on which money may be available at what cost/unsecured interbank borrowing. Hence, the panel banks' submissions must have been related to the cost of borrowing unsecured funds in the interbank market and no other factors such as own trading positions (British Bankers' Association 2008, p. 10) and must have been made without reference to rates contributed by other panel banks (United States District Court of Connecticut 2015, Exhibit 3: 3). Nevertheless, in case of a sudden and dramatic loss of liquidity, i.e. the absence of actual liquid credit markets, banks became reluctant to borrow each other funds, specifically not on unsecured basis—Ashton and Christophers (2015, p. 193) make reference to an imagined market; along the same lines argues Vasudevan (2013, p. 6), LIBOR must be a fiction. Responsible for the interest reference rate submissions of the panel banks were the submitters; more precisely, individuals who knew the currency situation of a specific market. The submitters were very often derivative traders (so called 'trader-submitters', see also illustration of the concerted submission manipulation scheme in Fig. 3, footnote 1)—a relationship, which was not allowed by the BBA—owning positions in the currency under consideration. Hence, dual role and conflicting mandate of trader-submitters, bearing competing objectives, created conflicts of interest. Additional inherent structural conflicts of interest existed as the BBA—neither part of the British state, nor regulated, occupying a hybrid place between state and market (Bryan and Rafferty 2016, p. 78)—installed a Foreign Exchange and Money Market Committee (FX&MMC) to monitor and oversee the reference rate submission process on a monthly basis. The FX&MMC was selected by LIBOR panel banks and user groups, chaired by members of contributing/panel banks. Hence, the contributing banks were able to oversee themselves in an act of self-regulation[12] (supportive Angeletti 2017, pp. 130–1; Kregel 2012, p. 5; McConnell 2013, pp. 64, 67–8, 2017, pp. 42, 47–8)), reflecting the absence of an independent capable guardian. The BBA itself wrote and characterized as 'serious issue' (British Bankers' Association 2008, p. 10) that LIBOR is not perfectly understood by market participants and observers, which required the BBA to correct a number of misunderstandings and misinterpretations (British Bankers' Association 2008, pp. 4, 12). Hence, (risk) management failures concerning the interest reference rate determination and submission process were wide-spread in financial institutions. UBS had no systems or controls in place governing the procedures for its LIBOR submissions. In addition, no formal training was provided to submitters about the submission process (Financial Services Authority 2012, p. 27). The lack of documentation and training was apparent in other banks involved in the LIBOR scandal, exemplified by Barclays Bank (Commodities Futures Trading Commission 2012a, pp. 35–40), Citigroup (Commodities Futures Trading Commission 2016, pp. 29–30, 33–4) and Deutsche Bank (Financial Conduct Authority 2015, pp. 21, 35).

Individual Forces

The number of financial institutions (Table 6) and individuals (Table 7) involved in the LIBOR scandal makes it challenging to extract and examine all individual triggers and turning points. Nevertheless and in a generalized manner, for the first primary purpose of the interest reference rate manipulation—benefitting own trading positions—the trigger was remuneration, i.e. influencing performance based salary components (variable compensation/bonus) (supportive United States District Court of Connecticut 2015, Exhibit 3: 36). Anecdotal evidence reveals that Hayes was excessively triggered by generating profits for his employers (he generated approximately USD 40 m profits in 2007, USD 80 m in 2008 and USD 116 m during the first 9 months of 2009 (United States District Court of Connecticut 2015, Exhibit 3: 25)) and finally himself (Enrich 2017, pp. 3, 23, 224–7). His gross income during his time at UBS was GBP 41 k in 2006 (5 months only), GBP 171 k in 2007, GBP 500 k in 2008 and GBP 410 k in 2009 (8 months only). At Citigroup, Hayes' gross income was GBP 2 m in 2009 (due to an up-front cash signing bonus from Citigroup) and GBP 1.5 m in 2010 (9 months only, before being dismissed

[12] The BBA, by highlighting, '*Members of the Committee are currently from contributing banks and believe their independent stance and ability to provide detailed scrutiny of the rates would be strengthened by widening the membership of the committee.*', implicitly confirms concerns around FX&MMC's independence (British Bankers' Association 2008, p. 12).

Table 5 Modus operandi, risk management failures and control weaknesses and early warning signals of the interest reference rate manipulation from an UBS perspective

Modus operandi	Risk management failures and control weaknesses	Early warning signals
Submission of material false, misleading or knowingly inaccurate statements for the calculation of interest reference rates • Numerous requests from UBS's traders—most prominent from a single Yen trader, i.e. Thomas Hayes, based in Tokyo—asking (i) UBS's interest reference submitters to adjust UBS's submissions to benefit own propriety trading positions (*1st purpose*) • UBS's traders also made co-ordinated requests/colluded with (ii) external employees (incl. submitters) of other panel banks as well as (iii) external interdealer brokers to influence LIBOR and EURIBOR submissions, including promises for additional business for the involved brokers with the help of wash trades (fictitious risk free trades, which cancelled each other out and which have no legitimate commercial rationale/motivation) or also threatening to move-/cut-off considerable volume of business to other brokers—both types of external requests were co-ordinated with internal submission requests (see i); the interdealer brokers utilized various methods to influence submissions of other banks (a) disseminating false 'run-throughs' to many, if not all, of the panel bank (b) directly contacting other panel bank submitters (c) publishing false market rates over certain dedicated manipulated electronic screens available to clients and (d) 'spoofing', i.e. making fake bids and offers for cash trades to further disseminate false pricing information to the market, all tailored to drive the submissions of other panel banks to the rates of UBS's derivative positions • UBS's senior employees/managers gave inappropriate guidance to submitters on a number of occasions during financial crisis (2007–2009), trying to influence the perception/media speculation of UBS's franchise/creditworthiness (*2nd purpose*) Instant message chat and email usage • More than 40 employees of UBS (traders and submitters) from Stamford/Connecticut, London, Zurich, Singapore, Tokyo and elsewhere were directly involved in the submission change requests; more than 2000 written internal and external requests were detected in total over a period of nearly 6 years from at least January 2005 onwards • Manipulated LIBOR and EURIBOR submission requests were often raised in open instant message chat forums/networks or by email (groups), most often using coded language; additional requests were made orally either in-person conversations or by telephone Initiation of corrupt payments (illicit fees/brokerage commissions) to interdealer brokers • UBS made commission payments of GBP 170 k to one broker and GBP 12 k per quarter to another to reward both for their 'fixing service' assistance for a period of at least 18 months	Substantial failures of management control and inadequate/lax supervision • Management control of submission process was inadequate and contained serious systemic weaknesses, i.e. submissions were not appropriately reviewed by management from January 1, 2005 until August 7, 2008 • Improper trader change requests were not detected, ignored and/or tolerated by responsible management (2–3 levels below UBS's Group Executive Board), camouflaging them as 'market colour' • Undue influence was never escalated into Compliance and/or Legal • From August 2008 onwards, a weekly exception reporting regime, evaluating the actual interest reference rate submissions against UBS's daily average cost of funds, was implemented; the regime was supervised by managers who were aware of the manipulations and who also raised own submission requests Managing conflicts of interest • UBS, as other banks, combined the roles of determining LIBOR and EURIBOR submissions on the one hand and proprietary trading in derivative products referencing to LIBOR and EURIBOR on the other, i.e. creating dual roles/mandates with trader-submitters • LIBOR and EURIBOR submitters (if not identical, acting in personal union) had their workplace next to the proprietary traders who in turn had pronounced interest in the desk's trading positions • Trading and submitting roles were only split in September 2009 (for LIBOR) and October 2009 (for EURIBOR) by moving submission responsibilities into Asset Liability Management (ALM); ALM also did not fully prevent its derivative traders from attempting to manipulate interest reference rates Policies and procedures • UBS's earliest written procedures concerning the LIBOR and EURIBOR submission process dated from February 2005 and were limited to operational details; very limited practical guidance on how to submit was included; more detailed procedures were published in August 2008 and subsequently revised in December 2009 • Updated procedures from 2008 were never circulated amongst the submitters and no training concerning the procedures was conducted • None of the then existing policies contained any reference to potential conflicts of interest, relating to traders and/or submitters Insufficient transaction monitoring systems • UBS's systems and controls did not detect any of the wash trades, which were entered for channelling corrupt commissions to brokers Infrastructure and control function weaknesses • Two reviews conducted by Compliance and three by Internal Audit were not able to notice the misconduct—Internal Audit was aware of the need to ensure conflicts of interest did not arise, but failed to recommend any further steps (or measures) in connection with UBS's LIBOR submission process • Compliance' report revealed, there is no correlation between the submissions and UBS's trading positions—relying hereby on an analysis performed by a trader-submitter Remuneration practices/financial incentive systems • On average, the variable remuneration part of the submitters and the traders ranged between 200% and 500% of their base salary; inherent personal incentives existed to benefit from proprietary trading positions, influenced by UBS's manipulative submission behaviour	External warning • In February 2005, a UBS client complained in an email to a UBS submitter for Swiss Franc LIBOR that UBS's submissions were contributing to the benefit of the bank's positions; in a response email back to the complainant (a UBS senior manager was copied), the submitter did not deny this practice and rather justified such conduct as wide-spread standard banking practice • Bloomberg published an article focussing on a surge in the USD LIBOR submissions for the overnight tenor on August 9, 2007 by a number of contributing banks; the article commented on UBS's submission, which was 65 basis points higher versus the previous day (later, UBS's borrowing cost would have significantly increased; UBS announced, the submission was made in error) • Two articles in the Wall Street Journal (WSJ), published on April 16 and May 29, 2008, highlighted possible irregularities in the process of fixing LIBOR, i.e. contributing banks might submitting too low rates • British Bankers' Association (BBA) and other financial regulators triggered the initiation of a review of the LIBOR submission process after publication of the two WSJ articles Trading performance/revenue • Thomas Hayes' trading performance continuously grew; he was generating profits of approximately USD 40 m in 2007, USD 80 m in 2008 and USD 116 m until late summer in 2009 (i.e. three times of his profit in 2007), before he stopped trading and he left UBS (on September 3, 2009) following a dispute over his compensation, joining Citibank Cognisance • In total, approximately 40 employees (thereof 13 managers and 5 senior managers) knew of or even were involved in the routine manipulative misconduct practices at UBS

Source Authors' representation, based on Commodities Futures Trading Commission (2012b), Financial Services Authority (2012), Swiss Financial Market Supervisory Authority (2012) and United States District Court of Connecticut (2015)

in September) (Angeletti 2017, p. 134). For management, the trigger for the second purpose of the LIBOR scandal—misrepresentation of financial viability—was fundamentally the fear of falling and not to survive the financial crisis, which was reaching its peak phase with the bankruptcy of Lehman Brothers on September 15, 2008. Hayes, as ringleader, was orchestrating traders, submitters and third party providers (interdealer/cash brokers) over years in an unauthorized way, resulting in thousands of reference rate adjustment requests (routine nonconformity). In early 2015 and before Hayes' trial, he was diagnosed with Asperger's syndrome. Hayes appealed against the LIBOR conviction based on his Asperger diagnosis beginning of 2017, an attempt to normalize his behaviour ex-post.

Group Forces Type A

Figure 3 provides a schematic overview about the acting in concert behaviour in the LIBOR scandal. Manipulative activities took place within banks but also across them, in part supported and facilitated by interdealer/cash brokers. In accordance, Bryan and Rafferty (2016, pp. 72, 75) emphasize that calculative systems and practices (such as the LIBOR rate determination) are constitutive of social relations. Ashton and Christophers (2015, pp. 198, 201) show in their analysis of the LIBOR scandal from a Barclays Bank perspective, often ex-Barclays Bank employees raised manipulative interest reference rate requests to then current Barclays Bank traders, evidencing the high interpersonal nature of the acting in concert practice by toxic individuals ('collusion between friends' as per McConnell 2017, p. 47). The collusive interaction started small-scaled in or at around 2005, whereas it reached its peak time in September 2008 with the bankruptcy of Lehman Brothers and thousands of manipulated reference rate requests to influence to perception of creditworthiness (deviance amplification and escalation). Trials, which have taken place in the interim, revealed repetitive defeat strategies from the accused traders referring to wide-spread industry practices (collective normalization and rationalization), described by Angeletti (2017, p. 133) as an act of collectivization of responsibility.

Group Forces Type B

Evidence suggests, a number of managers knew about and in some cases were actively involved in the LIBOR manipulation at UBS. The Financial Services Authority (2012, p. 4) counts 40 individuals directly involved, of which 13 were managers and five senior managers, who were aware of the submission manipulation practice. The circumstances around management awareness were similar at other banks, for example, Deutsche Bank (Financial Conduct Authority 2015, p. 34), Rabobank (Financial Conduct Authority 2013c, pp. 4, 9) and Royal Bank of Scotland (Financial Conduct Authority 2013a, pp. 3, 19–20), confirming in line with NAB's and JPM's CRT events the consent and cooperation principle. Management's awareness and even its active involvement in the submission manipulation to mask problems concerning financial viability/liquidity sheds light on risk acceptance/allowance behaviour of involved financial institutions and corporate decision makers. Given the length of the collusive interaction scheme, which started in or at around 2005, it is remarkable how overconfident acting individuals and their management were in terms of the probability of detection. Normalizing processes, including moral disengagement, led to self-deceptive illusions of control/invulnerability (Janis 1972).

Discussion

From the model construction to the evidence-based analysis,[13] our research suggests that the outlined three forces on organizational/structural, individual and group level, contribute to CRT. Consequently, OMB theory is suited to be applied to CRT due its ability to explain negative/dark consequences of complex corporate workplace environments on macro, meso and micro level. This is in contrast to existing explanation approaches from White-Collar Crime (WCC) research that miss the macro analysis of organizational features (supportive Reurink 2016, p. 410) as well as Leaver and Reader's (2017) recent research, analysing trading misconduct through the lens of safety culture theory, in which specific forces on micro (individual) and meso (group) level are underrepresented.

There is a tendency in management for erroneous beliefs concerning the tolerability of OMB (as one group force type B), in particular CRT. The fact that big risk takers can develop into 'toxic workers' (Housman and Minor 2015) or speculative traders into rogue traders is not new. Turner and Pidgeon (1997) highlight, cultural collapses and man-made disasters occur due to the inaccuracy or inadequacy of accepted norms, values and beliefs. According to Turner and Pidgeon, cultural adjustments aim for the completion of lessons learned, issued and directed through authority from the top, to close an incident by adjusting erroneous norms and beliefs, which led to the event. However, no lessons have been learned from past organizational wrongdoing to adjust norms, values and beliefs.

[13] Limitations of our research lie in the case study approach—relying on public available investigation reports (prepared and issued by regulatory authorities/supervisors as well as authorized delegates like accounting or law firms engages by the involved banks), published academic research, news/media information—that is prone to hindsight bias effects.

Table 6 Interest reference rate manipulation/LIBOR scandal: Overview of affected financial institutions and fines by regulatory authority[a] (in USD m, alphabetical order)

	Commodity Futures Trading Commission (CFTC)	United States Department of Justice (DoJ)	43 States and the District of Columbia in the US	U.S. District Court Manhattan	Financial Conduct Authority (FCA)	European Commission	Other[c]	Total
Barclays Bank	200	160	100		76.8			536.8
Citigroup	175			130		79.1		384.1
Credit Agricole						129.6		129.6
Deutsche Bank	800	775	220	240	292.6	819.7	600	3747.3
HSBC						38	35	73
ICAP	65				18.1	17		100.1
JPMorgan Chase		550				540.9		1090.9
Lloyds Bank	105				135.5			240.5
Rabobank	475	325			135.5		79.1	1014.6
Royal Bank of Scotland	325	50			112.9	441.9		929.8
RP Martin	1.2				0.8	0.3		2.3
Société Générale	475	27				257.3		759.3
UBS	700	500			206.4	-[b]	59.9	1466.3
Total	3321.2	2387	320	370	978.6	2323.8	774	10,474.6

Source Authors' representation, based on own research. Fines in currencies other than USD are converted to USD using an average exchange rate for full year 2017 for comparison

[a]This overview does not include settlements with clients out of civil claims/proceedings

[b]UBS avoided another regulatory fine of USD 2.83 bn (EUR 2.5 bn) from the European Commission because of its expert witness role during the interest reference rate manipulation investigation

[c]Other including the New York State Department of Financial Services for Deutsche Bank, The Office of the Comptroller of the Currency (OCC) for HSBC, the Dutch Central Bank for Rabobank and the Swiss Financial Market Supervisory Authority (FINMA) for UBS

Contrary to the acceptance of OMB, banks need to implement a proper risk culture, including dedicated behaviour and conduct guidelines how to behave and interact within the organization but also with external stakeholders. Due to the complexity of multi-national corporations, distinctions into local levels of culture need to be made (supportive Financial Conduct Authority 2018, p. 18). The role and power of middle management and its function as transmission layer between corporate decision makers and executives on the one hand and workforce on the other, being able to filter critical/unwanted feedback from channelling through to the top, need to be considered thoroughly. A strong risk culture is supported by reward and punishment systems, including consequence management frameworks, following up on and sanctioning OMB/conduct breaches.

Organizations are required to foster a speak-up culture (contrary to a culture of fear), which is heard by those who set the tone at the top, including effective whistle-blower mechanisms (e.g. whistle-blower/integrity hotlines) that ensure potential indications for OMB are directed to the top and the whistle-blower is protected. Situations and circumstances reflecting ethical ambiguous situations (grey zones including potential conflicts of interest) and dilemmas need to be contextualized to remind acting individuals and groups of their own moral identity and moral compass. Behaviour and conduct training, education and orientation should stimulate self-regulation and self-control for moments that matter and turning points into OMB and ensure an active speak-up culture participation.

Considerations need to be made avoiding the selection and hiring of likeminded employees and in turn fostering diversity and heterogeneity throughout all levels of the organizational hierarchy/chain of command, preventing acting in concert ('buddy networks' and 'collusion between friends') and minimizing the density and exposure to corrupt personnel. Regulatory recommendations for the avoidance of the 'rolling bad apples' phenomenon—i.e. individuals who engaged in misconduct but are able to obtain subsequent employment elsewhere, without disclosing their earlier misconduct to the new employer and repeat their misbehaviour—have been announced recently (Financial Stability Board 2018, pp. 32–44).

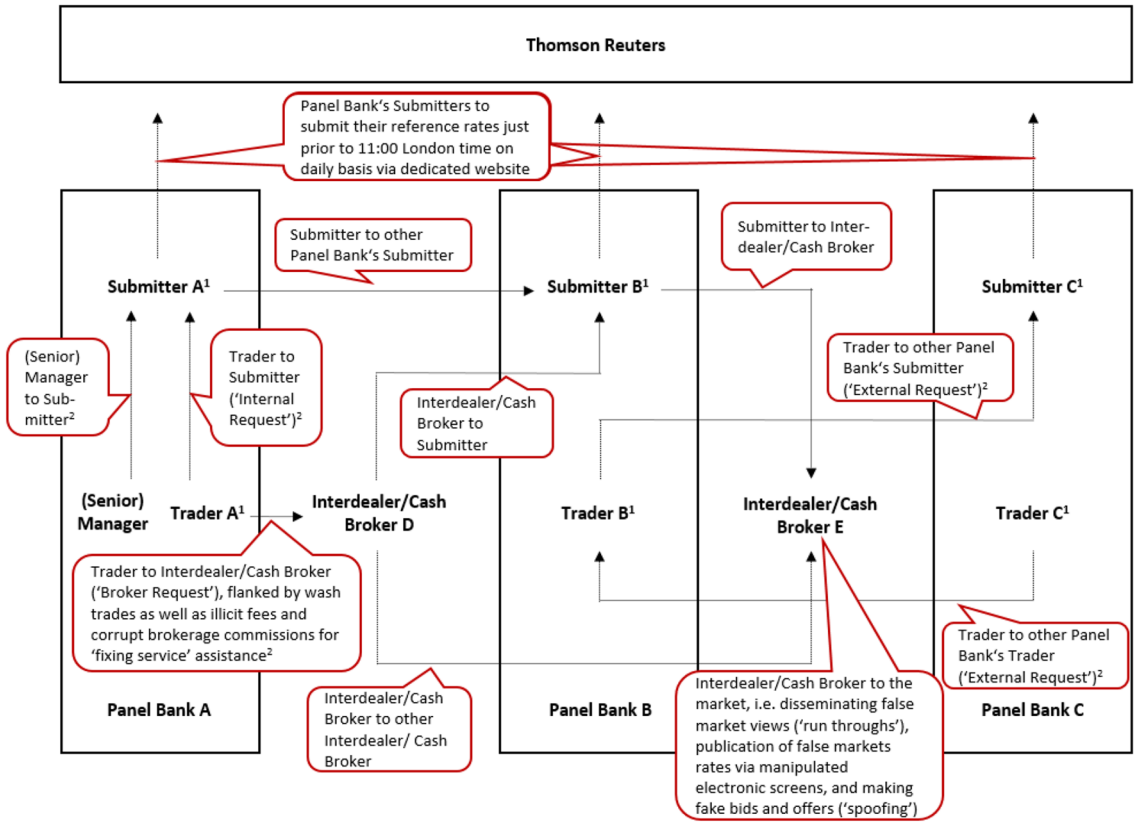

Fig. 3 Interest reference rate manipulation/LIBOR scandal: Schematic interaction model and collusion process from an UBS perspective. *Source* Authors' representation, based on Commodities Futures Trading Commission (2012b), Financial Services Authority (2012), Swiss Financial Market Supervisory Authority (2012) and United States District Court of Connecticut (2015)

From a regulatory perspective,[14] supervision is not only about ensuring compliance with the rules but also with the spirit (Financial Stability Board 2014). Behaviour and culture—i.e. the human element in the performance of banks—are essential supervisory topics and should be monitored in line with strategy and business model, strategic organizational business goals and governance. The incisive supervision of behaviour and culture increases the effectiveness of supervision on the one hand and contributes to the detection of issues and problems before they could lead to misconduct on the other. Where culture reveals itself in behaviour, culture can be observed—especially patterns of misbehaviour. Regulators and supervisors need to identify and assess behaviour and culture, focussing on the banks' boards and their top leaders. This includes culture inspections of board effectiveness and change effectiveness as well as root cause analysis to identify cultural drivers that might cause risks on behavioural level (De Nederlandsche Bank 2015).

Conclusion

In this paper, we provide the first descriptive explanation model for collusive rogue trading (CRT). We prove the existence and application of main organizational misbehaviour (OMB) theory paradigms for three major CRT events from recent history and specify three forces on macro (organizational/structural), meso (group) and micro (individual) level that contribute to CRT.

In order to mitigate potential CRT, banks are required to foster a proper risk culture, in which they constantly (re)calibrate and validate the organizations' risk allowance and risk tolerability of OMB. Banks need to set up effective

[14] We deem external audit as being part of the regulatory framework for banks; hence, our policy recommendations for the regulatory role are applicable to external audit as well. We see the mandate of internal audit in the examination of the adherence to operational standards, thereby assessing the control environment (i.e. design effectiveness and control effectiveness) as well as the management awareness (i.e. management's involvement and pro-activeness in detecting and closing control gaps).

Table 7 LIBOR scandal: trader overview

Jurisdiction	Status	Former trader	Institution	Imprisonment (initial) (years)	Fine [USD k]	Additional information
U.K.	Pleaded guilty; under review/appeal	Thomas Hayes	UBS (last employer)	11 (14)	1394	Hayes has exhausted available court appeals and referred his case to the Criminal Case Review Commission (CCRM)—CCRM accepted Hayes' case for review
		Jay Merchant	Barclays Bank	5.5 (6.5)	472	According to Merchant's lawyer, Hannah Raphael, Merchant is planning to refer his case to the CCRM
		Alex Pabon		0.75 (0.75)	3.64	Pabon was released from prison in March 2017
		Jonathan Mathew		4	54.9	Mathew has exhausted available court appeals and referred his case to the CCRM—pending acceptance decision
		Peter Johnson		4	228.9	Johnson pleaded guilty
		Philippe Moryoussef		8		Moryoussef pleaded guilty
		Christian Bittar	Deutsche Bank	5.3	4448	Bittar pleaded guilty
	Not prosecuted but fined	Neil Danziger	Royal Bank of Scotland		396	The FCA banned Danziger in relation to any regulated financial activity in the City
		Paul White			396	The FCA banned White in relation to any regulated financial activity in the City
		Guillaume Adolph	Deutsche Bank		278.6	The FCA banned Adolph in relation to any regulated financial activity in the City
	Acquitted; jury was unable to reach a verdict	Stylianos Contogoulas	Barclays Bank			
		Darrel Read	ICAP			
		Danny Wilkinson				
		Colin Goodman				
		Terry Farr	RP Martin			
		James Gilmour				
		Noel Cryan	Tullett Prebon			
	Waiting for proceedings	Andreas Hauschild	Commerzbank (last employer)			Hauschild has been arrested during his vacation in Italy in August 2018; the Italian authorities ruled that Hauschild should be extradited to the U.K. on October 12, 2018; Hauschild got charged by the Serious Fraud Office (SFO) on October 21, 2018; in addition to Hauschild, two other former Deutsche Bank traders (prior to Commerzbank, Hauschild worked for Deutsche Bank) waiting for their proceedings in the U.K.
US	Pleaded guilty	Paul Thompson	Rabobank	0.25		Thompson faced up to 30 years' jail time after pleading guilty in July 2016; final sentence is 3 months in an U.S. prison with a medical facility.
		Matthew Connolly Gavin Black	Deutsche Bank	N/A	N/A	Both, Connolly and Black, have been convicted on October 17, 2018—the sentence date has not been set; during their trial, the former Deutsche Bank traders Michael Curtler and Timothy Parietti served as expert/cooperating witness against Connolly and Black
	Acquitted	Anthony Allen	Rabobank	– (2)		A New York Appeal Court tossed out convictions for both, Allen and Conti, ruled that their forced testimony to a U.K. financial regulator was improperly used against them in an U.S. criminal trial by a key governance witness (i.e. Paul Robson, who was also working at Rabobank)
		Anthony Conti		– (1)		
		Ryan Reich	Barclays Bank			
	Waiting for proceedings	Colin Bermingham Carlo Palombo Sisse Bohart[a]	Barclays Bank			
		Danielle Sindzingre[a] Muriel Bescond[a]	Société Générale			

Source Authors' representation, based on Bray (2016), Gower and Ring (2016), Matussek (2018), Ring (2017, 2018), Ring and Hodges (2017), Ring and Wild (2017), Van Voris et al. (2017) and Wild (2018)

[a]Female trader

behavioural risk management and internal control frameworks. Real-time trade(r) behaviour and communication surveillance systems need to be designed and implemented to detect and escalate non-standard trade patterns (e.g. large and unusual trade behaviour). Our case analysis methodology offers a range of specific early warning signals on individual trader and on trader group/desk level to detect CRT at an early stage. Regulatory frameworks should require the management function to proactively assess and manage culture risk and promote the creation of learning systems—including feedback loops and lessons learned processes—to create a corporate culture that reinforces appropriate norms of responsible ethical behaviour (Filabi 2018).

Future OMB research should analyse patterns of conscious and unconscious group dynamics—e.g. groupthink, as concurrence seeking tendency of like-minded isolated groups, and defence mechanisms minimizing moral dissonance (like wilful blindness or moral neutralization)—to deepen the understanding of the occurrence and acceptance of dark side behaviour in corporate workplace environments. From a policing viewpoint, principle-agent relations and agent (e.g. middle management) liability in the field of OMB need to be examined more closely, also from the perspective of less personal accountability for corporate wrongdoing.

Acknowledgements We would like to thank the anonymous referees for their valuable comments.

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