Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View

ABSTRACT

Using an information processing perspective we identify two reasons why boards failed to manage risk well 1) board members did not get relevant information about risks incurred by management because they lacked control over information supply; 2) board members were not able to process such risk-related information and lacked incentives or power to influence managerial decision making. Based on insights from cybernetics and decision making theory, we suggest increasing the information processing and decision making capabilities on the board level, by including multiple stakeholders on multiple boards based on a division of labor and a division of power; this alternative structure we label network governance.

This paper is one of the few papers making actual recommendations based on systemic insight. Practitioners that agree with the analysis will be able to draw conclusions for their proper governance structure, especially when their businesses operate in increasingly complex environments. Regulators could equally learn from those recommendations and include basic insights generated in their regulatory frameworks.

Keywords: Corporate Governance, Complexity, Network Governance, Information Processing, Risk Management.
INTRODUCTION

The greater the uncertainty of the task the greater the amount of information that has to be processed between decision makers during the execution of the task to achieve a certain level of performance. (Galbraith, 1974:28)

We are experiencing a global epidemic of institutional failure that knows no bounds. We must seriously question the concepts underlying the current structures of organization and whether they are suitable to the management of accelerating societal and environmental problems – and, even beyond that, we must seriously consider whether they are the primary source of those problems (Hock, 1999:6).

The financial crisis of 2007/2008 has been attributed to many causes (folly, fraud, greed, incompetence) rooted in actions by interdependent actors from the state level to the organizational level down to the individual level (Bernanke, 2009; 2009; Rosales, 2009; Taibbi, 2010). As the crisis unfolded American shareholders nearly lost 10.2 billion U.S. dollars (Kalwarski, 2009) and 45% of worldwide wealth has been destroyed (Davies & Siew, 2009). Three of the largest bankruptcies have occurred within that time frame and observers point out that corporate boards did a very poor job exercising their fiduciary duty to manage risk (ACCA, 2008; Kirkpatrick, 2009; S1074, 2009).

This paper is motivated by the evident failure of boards to manage risk prior to the financial crisis. As the crisis was of systemic nature rather than firm specific we look at systemic governance properties designed to support effective risk management on the board level. Specifically, to analyze the general ability of unitary boards to support good risk management
we employ an information processing view (Egelhoff, 1982; Galbraith, 1974; Premkumar, Ramamurthy & Saunders, 2005). To propose ensuing alternative structures, we draw on insights generated by the field of cybernetics (Ashby, 1956; Turnbull, 2002b; Weiner, 1948) and decision making theory (e.g. Kahneman, Slovic & Tversky, 1982; Simon, 1979).

Employing those insights, we argue that there are two generic reasons why boards failed to fulfill their duty to manage risk well: 1) board members did not get relevant information about risks incurred by management because they lacked control over information supply; 2) board members were not able to process such risk-related information and lacked incentives or power to influence managerial decision making. Consequently, we suggest increasing the information processing and decision making capabilities on the board level, by including multiple stakeholders on multiple boards based on a division of labor and a division of power; this alternative structure we label network governance (see also Jones, Hesterly & Borgatti, 1997). In the following pages, we will substantiate this argument.

THEORETICAL BACKGROUND

Central to the analysis of the paper is the information processing view (Egelhoff, 1982; Galbraith, 1974; Premkumar et al., 2005). Galbraith (1974) observed that decision makers’ need for information depends on the degree of task uncertainty. He argued that the “greater the task uncertainty, the greater the amount of information that needs to be processed among decision makers during task execution in order to achieve a given level of performance” (p.28). Galbraith (1973) further suggests three conceptual elements that form the core of the information processing view: information processing needs, information processing capability, and the fit between the two to obtain optimal performance. In this paper, we will
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View
draw on this conceptualization to examine why there was a systemic misfit of information processing needs and information processing capabilities in terms of risk-related decision making on the board level. In addition, we consider the incentive and power of individual board members to take corrective action.

This article does not stop at the analysis level; in fact, the authors wish to present a new perspective on corporate governance design and control that fundamentally challenges the existing paradigm of unitary and even dual corporate board structures. We label our proposed alternative *network governance*. To develop our propositions for better information processing structures on the board level, we draw on the science of governance also known as cybernetics. We embed our suggestions in the perspective of cybernetics applied to management as proposed by Beer (1959, 1981) and more specifically as applied to corporate governance as proposed by Turnbull (2002a; 2002b). This perspective draws on successful information processing architectures that govern complex organisms in dynamic environments; such as the central nervous system of the human body (Beer, 2002). The science of governance explains, for example, how distributed decision-making (von Neumann, 1947), parallel communication channels (Shannon & Weaver, 1949), and a requisite number of controllers (Ashby, 1956) can reduce errors, risks and failure of information processing. The science of corporate governance (Turnbull, 2002b) further illustrates how the risk of information processing failure can be reduced, by introducing multiple stakeholders and multiple boards to create requisite feedback loops to ensure quality information processing at the board level.
AN INFORMATION PROCESSING VIEW OF BOARD LEVEL RISK MANAGEMENT

The banking industry was once tightly regulated and considered rather stable, but the dynamics of a global marketplace have created an increasingly uncertain environment. Furthermore, investment banks have increased the complexity of their operations by using financial engineering and innovative sales techniques (as documented in the subprime mortgage industry). As a consequence, task uncertainty for board members managing banking-related risk has increased. The structures to support the need for increased information processing, however, were not adapted, but remained geared to a simple business model and a stable environment.

Fligstein and Goldstein (2009) observe that in 2007, the US market for originating prime and sub-prime mortgages became highly concentrated with 25 firms being responsible for 90% of the combined prime and sub-prime market. All 25 firms operated as centrally controlled hierarchies with a unitary board. According to Nohria (1995), hierarchical structures, as reflected in unitary boards, do not function well in dynamic and complex environments, partly because they are inflexible and do not support information processing as well as e.g. network structures. Jones et al. (1997) further observe that in dynamic environments of emerging technology enterprises governance is taking on network shapes to process information better.

However, in the banking industry as Fligstein & Goldstein (8) report:

every large originator and packager of mortgages held onto substantial numbers of mortgage backed securities. They believed that they could control the amount of risk [highlight by the authors] they held. The result is that most of these firms are either out of business, merged into larger banks, or owned by of the federal government.
Fligstein & Goldstein (2009:38) go on to say: “that there was ample information about the riskiness of the underlying mortgages in the subprime MBS [Mortgage Backed Securities] packages sold at the height of the bubble. That information was readily accessible to anyone with a computer and a fast line to the SEC.”

This account highlights the failure of information processing at the board level; information needs and information processing capabilities did not fit to allow for optimal risk management. In the following, we will separately analyze the systemic limitations of unitary boards to fulfill directors’ information needs, and support necessary information processing capabilities to control risk adequately.

**Problem: Unfulfilled Information Needs at the Board Level**

A first reason for inadequate risk management at the board level can be witnessed in the lack of information access to risk relevant information. In fact, as the Lehman Brothers bankruptcy report highlights, several critical information pieces were not passed on to the board (Valukas, 2010). For example, in 2007 management did not inform the board about its excessive risk taking for a period of 4 months.

There is no evidence that the Board was informed that Archstone and at least one other bridge equity deal had been excluded from Lehman’s risk appetite usage calculation for almost three months, or that Lehman would have been over its risk appetite limit for much of the period since June 1, 2007 if those bridge equity deals had been included in the calculation in a timely manner (Valukas, 2010:140).

The board was also not informed about the internal disagreement regarding risk management strategies. CEO and Chairman Richard Fuld and his allies filtered out substantial arguments
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View

against his strategy, when presenting to the board. For example, the report states that many senior managers argued that Lehman was operating in a ‘credit bubble’ and saw the train wreck coming (Valukas, p: 120). However, none of this information reached the board. Similarly, a whistleblower within Lehman reported accounting irregularities to senior managers and the auditor Ernst & Young, but never to the board members directly (see also Bernanke, 2010). While board members were informed by management about a high risk strategy, the actual risk involved was never accurately disclosed due to liabilities that were off the books (so called Repo 105 transactions).

Furthermore, since the Finance and Risk Management Committee only met twice per year during 2006 and 2007 (Minow, 2008) it is quite possible that a lot of the necessary information was not accessible to the board. When the number of board meetings increased in the wake of Bear Stearn’s implosion “Lehman’s management continued to report on the firm’s elevated risk profile and concentration of real estate and leveraged loan risk, but did not present the Board with additional negative information concerning the firm’s risk and liquidity profile.” (Valukas, 2010: 139).

When the full Board met again on October 15, 2007, O’Meara [CFO; insert by the authors] disclosed that Lehman was over its firm-wide risk appetite limit. But O’Meara did not want the Board to conclude that Lehman was “out of bounds,” so O’Meara edited the standard chart provided to the Board at each meeting. Previously, that chart showed the firm’s risk appetite usage and risk appetite limit in close proximity, so that the directors could easily see how much below (or above) the usage was compared to the limit. Before the October 2007 Board meeting, however, O’Meara directed that the limit information be removed from the final version of the chart. He explained to the Examiner that management was not troubled by being over the limit and he preferred to explain the overage to the Board orally rather than through written materials (140).
As the report goes on, many of Lehman’s directors told the Examiner that this information about the extent and duration of any risk appetite limit excess would have been helpful for them to have received. Some directors did not recall knowing that Lehman had ever been in breach of its risk appetite limits. Although none of the directors said that they would have changed their views had they received that information, they did say that they would have wanted to have a conversation with management about the reason for the limit overages and management’s strategy for resolving them (141).

While the report cites more incidents of insufficient information supply to the Lehman board, similar problems occurred at Freddie Mac and Fannie Mae (see e.g. Weiss, Jickling & Cristie, 2007) Citibank, WAMU, and many other players. Board Members of Freddie Mac and Fannie Mae, e.g. actively complained that they did not have unfettered access to management (Weiss et al., 2007: 252). The shareholder lawsuit against the board of Citibank alleges that the board was inactive and did not follow up on ‘red flags’ that were raised. WAMU’s board was considered so passive that it did not even ask for the relevant risk information. While it is questionable that this information would have changed respective board action, the general problem of limited information access is pertinent. As Ben Bernanke (2009) specifies:

> “one of the key lessons for bankers has been the need for timely and effective internal communication about risks. We are putting a high priority on ensuring that management and board of directors are well informed about the various risks that confront the organization and that they are actively engaged in the management of those risks.”

We argue that the fundamental problem of insufficient information supply is caused by structural information loss occurring in hierarchies. In fact, we believe this problem won’t be solved by more regulation, including changing types of directors (females, outsiders,
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View

independents etc.) on the board or any other currently proposed remedy (see proposals by OECD, S1074 etc.). Members of a unitary board will continue to suffer from limited information supply because of the distance risk related information needs to travel from the place of origin to the place of control in the hierarchical structure.

To illustrate this point further, consider the below illustration of the structural information loss (Downs, 1967), based on the generous assumptions that humans are able to receive 50% of the information transmitted (see Table 1). Due to real-life time constraints one could expect that transmission rates would be even lower because humans are limited in their ability to transmit and receive information of any type (Williamson, 1975; Williamson, 1979); furthermore incentives for communicating risks in command-and-control hierarchies are low.

Even based on such generous assumptions for information flow, when a message has to pass through five levels to go from the sender to ultimate receiver, the message has lost more than 96% of its original content. If we further assume that part of the information relayed is misinterpreted, biased or false (as in the Lehman case), the amount of information passed to the board will decrease even more. As a consequence it is unsurprising that directors are not fully informed about business risks.

Some scholars have argued that for superior governance boards only need to get the *relevant* information (Thomas, Schrage, Bellin & Marcotte, 2009). We do agree, but we also wish to
Corporate Governance, Risk Management, and the Financial Crisis—An Information Processing View

point out the low probability that relevant information is reaching the board. These scholars further argue that existing information asymmetries need to be reduced by building trust between the different hierarchical levels. By nature, however, hierarchies are ill equipped to foster trusting relationships because of power differentials (Noteboom, 1996; Noteboom, 2002). While the establishment of trusting relationships is commendable, it is questionable that existing systemic barriers can be overcome (Turnbull, 2004). The examples of the failed financial institutions furthermore provide support for mistrust as a superior risk management strategy.

Proposition: Increase information supply by increasing communication channels on the board level

To improve information access and fulfill the information processing needs of board members, we suggest to reduce the distance risk-related information has to travel. As mentioned in Lehman’s case, a number of employees including Chief Risk Manager Madelyn Antoncic and the head of the Fixed Income Division, Michael Gelband, were concerned about the leverage and liquidity status within Lehman for a long time (Valukas, 2010:46). Similarly, selected shareholders of Citibank and AIG were well informed about business risks (Brady & Pileggi, 2009). In the case of Lehman, even the Office of Thrift Supervision, the SEC, and the Treasury Department were warning Chairman Fuld of the high leverage risk long before the bankruptcy (Valukas, 2010). Similarly at Fannie Mae and Freddie Mac problems about irregularities had long been known to the outside. John McCain and other Senators actually proposed a bill in 2005 to interfere with the practices at both institutions, since they were deemed too risky (Morrissey, 2008). These examples highlight that relevant risk information was known to concerned stakeholders, who were also willing to share it. However, this information did not and could not reach the board in any systematic
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View

If there was a way to increase the chances that these concerned stakeholders share their information with the board directly, much of the information need could be fulfilled. To do that, we suggest introducing multiple stakeholders on the board level in a systemic manner.

To make a stronger case for the inclusion of stakeholders on the board level, let us revisit insights provided by cybernetics. In 1949, Claude Shannon, a Bell Telephone communication scientist, mathematically proved that the accuracy of communications can only be improved by having additional communication channels to cross check accuracy; not by simply improving the ONE existing channel (Shannon & Weaver, 1949). In a social context, law courts have unknowingly applied this natural law by requiring corroboration of independent witnesses. Journalists from responsible media organizations are likewise required to cross check their stories from various independent sources. When IT specialists respond to demands for high-reliability internet connections, they make sure that there are many parallel channels that can be used to transport data. In case one channel fails, others can still provide the relevant information.

Directors of most financial service companies, however, have not established parallel channels to cross-check information provided by management. More often than not they have to trust the accuracy of managerial information. Board members still consistently complain about the reliability of information provided by management (Thomas et. al 2009), and express strong interest in obtaining information from a broader range of sources (McKinsey, 2007). They do lack control over information access and information supply.
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View

This is where Ashby’s Law provides further insight. Ashby (1956) has shown the impossibility of many variables being controlled centrally. His law states that a requisite variety of controllers is required to reliably control many variables (such as employees, business deals, products etc.). Ashby illustrates this point by considering a motel manager who needs to maintain a constant temperature in hundreds of rooms as the temperature changes during the day. There are just so many rooms for a single person to run around to continuously adjust windows and blinds. However, by installing air conditioners as co-regulators, one person can control many rooms by adjusting the thermostats. It is by firms engaging with stakeholders that directors can introduce the requisite variety of independent co-regulators to increase the reliability of risk-related information as much as desired.

As in the examples mentioned before, it is likely that many concerned stakeholders would want to share their information with the board. They could serve as parallel communication channels and co-regulators, which would increase information access, information supply, and information accuracy at the board level. In fact, the few banking institutions that fared well during the crisis, cooperative banks (Hansen & Spitzbeck, 2010; Kimakowitz, Spitzec, Pirson, Dierksmeier, Amann, 2010) consistently involved customers, suppliers, and employees in their governance process (see for example the Raiffeisen banks). We therefore suggest that the problem of information supply can be alleviated by including multiple key stakeholders in the governance structure so that information does not have to travel too far.

Proposition 1: To support increased information supply, the number of communication channels needs to be increased via systematic stakeholder inclusion on the board level.
Problem: Insufficient Information Processing Capabilities at the board level

A second cause of poor risk management, and maybe the more important one, lies in the insufficient information processing capabilities at the board level. The boards of most financial institutions typically include between 8-12 directors. Much research has gone into the correlation between board size and firm performance and typically a smaller board is recommended, because of efficiency losses of larger boards (Agoraki, Delis, & Panagiotis, 2009). However, in increasingly complex environments more information will need to be processed to perform adequate risk management. We argue that efficiency concerns should be complemented by overall effectiveness concerns. To increase information processing capabilities it is therefore important to acknowledge that human beings are naturally limited in their information processing capabilities (Williamson, 1979). A small number of directors is thus less likely to process the relevant information than a larger number; even when supported by information technology.

An example of how this insight has been applied we refer to the development of division of labor at the managerial level. Williamson (1975) explains how early in the 20\textsuperscript{th} century information overload on senior managers was reduced by changing the simple unitary (U-Form) management pyramid into divisional hierarchies. The multiple divisional or M-Form firms separated their activities into specialized functions such as manufacturing, sales, finance, human resources, and so on. However, no such decomposition in information processing labor was ever introduced at the board level at least in Anglo-Saxon firms. This was not the case in continental Europe where supervisory boards separated strategic information processing from operational information processing of their management board.
Information overload increases risk that relevant information will not be processed

Despite the fact that only a small percentage of information may be obtained by a board (Problem 1), the relatively few board members are still overwhelmed (Lees, 2007). As Carter and Lorsch (2002) state “boards are overwhelmed, overscheduled, undereducated and often uncoordinated in addressing key concerns of the enterprise and its stakeholders.” Carter and Lorsch (2002) go on to say that boards are asked to perform unrealistic duties given their traditional structure, processes, and membership.

The board of Lehman, for example, consisted of 10 people plus Richard Fuld in the CEO/Chairman role. Nine of the board members were retired, four of them over 75 years old, one was a theater producer, another a former Navy General and only two had direct experience in the financial industry (the less dynamic type of financial industry) (Berman, 2008). While diversity is generally an asset, we wish to highlight how difficult it must have been for these 10 board members to actually get to the bottom of the complex and risky business deals Lehman was involved in. As Nell Minow testified to the lawmakers: “A company in this sector should have a risk management committee that is vitally involved and has great depth of expertise.” (Minow, 2008). Similar problems could be witnessed on the board of Washington Mutual, and AIG, where complexity of business dealings created massive information overload for the few non-expert directors (Foley, 2009; Grind, 2009).

Individual biases and group dynamics distort rational information processing

As is well documented, human beings deal with information overload by employing heuristics (Kahneman et al., 1982). Directors will therefore filter out information that they can comfortably process. As many scholars claim, directors cannot pay attention to all the
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View
details, but often look for information that is familiar or that supports a favored perspective and/or interest (Hambrick, 2007; Ocasio, 1997; Kahneman, 1973). This filtering process is guided by psychological mechanisms such as biases, which have long been proven to lead to severe distortions of rational information processing (Kahneman et al., 1982; Reinhart & Rogoff, 2009). Next to the self-serving bias, the most common biases are overconfidence bias, anchoring bias, availability bias, confirmation bias, and escalation of commitment, which all played a role in the board decision making processes before the financial crisis (see e.g. Robbins & Judge, 2010).

Self-serving bias can be witnessed in the executive compensation that boards approve. Directors rarely question or disapprove bonuses suggested by management, since they do not want to risk being scape-goated. A case in point is the decision to pay Benoit Savouret, Lehman’s Chief Operating Office for Europe, a 16.2 million bonus when he was fired, while Chairman Fuld implored the Treasury Secretary to provide a tax-payer funded bail-out (Valukas, 2010). Overconfidence bias is probably best highlighted by the belief in financial models used extensively at AIG to price Credit Default Swaps (CDS). Anchoring and availability bias are demonstrated by the confidence of decision makers in historical data to predict future housing prices (Bezemer, 2009). The assumptions that ‘this time would be different’ (e.g. Reinhart & Rogoff, 2009) reflected confirmation bias, and the long time it took for many of the failed banks to actually change their business habits is a signal of the escalation of commitment (Lewis, 2008); well illustrated by Chuck Prince’s infamous quote: “As long as the music is playing you need to get up and dance.” (Reuters, 2010)

These individual biases were compounded on a group level, where social dynamics lead to phenomena associated with group think and group shift (see also Merchant & Pick, 2010). Group think describes the phenomenon that the norm for consensus and upholding a positive
group identity suppresses the realistic appraisal of alternative courses of action. Directors of Washington Mutual and Citibank, for example, were described as extremely timid, complacent, fearful to raise objections, and deferential to management (Grind, 2009; Brady & Pileggi, 2009). While Lehman’s board members privately mentioned doubts to the Examiner Anton Valukas, there is no evidence that these doubts were uttered openly during board meetings or that probing questions were asked of management (Valukas, 2010: 185).

As Reinhart and Rogoff (2009) point out group think played a crucial role leading up to the financial crises, when not only directors and managers, but economists and policy makers (including former Federal Reserve Bank Chairman Alan Greenspan) assured each other that “this time would be different.”

A further problem compounding self-serving biases on individual and group level is the lack of real external accountability and control. As Turnbull (2004) states, directors obtain absolute power to manage their own conflicts of interest. Monks and Sykes (2002:9) note that directors possess “at least six inappropriate powers giving rise to serious conflicts of interest”. While in a law court the judge, the jury and the experts are all independent of the accused, in public companies directors (accused) have the power to appoint their own judges (auditors), determine their own pay, select and remunerate so called “independent” advisors that will support their case to the jury (investors). Such arrangements fundamentally influence information processing and give rise to self serving decision making and poor risk management (see also Turnbull, 2009).

**Proposition**: Increase information processing capabilities by including multiple stakeholders on multiple boards
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View

To deal with the problems associated with information overload, including individual and group biases, recommendations usually focus on two aspects 1) reduce information overload by specialization and a division of labor, and 2) reduce effects of biases by establishing multiple perspectives (devils advocate’s, increasing diversity etc.) and a division of power. Neuroscience and cybernetics researchers concur with these suggestions, since the human brain (a superior governance mechanism) is actually not a central control organ (like the unitary board), but composed of different specialized lobes/regions, that are able to present different and competing perspectives during the decision making process (see e.g. Lawrence, 2010). Raichle (2010:33) describes the architecture of the brain as “a federation of interdependent components.” The NIH describes the brain as a committee of experts. “All the parts of the brain work together, but each part has its own special properties” (ScienceMaster, 2010).

We suggest that organizations can learn from that insight, and deal with information overload by installing multiple boards. That way labor is divided and boards can reap the benefits of specialization. Furthermore, through the involvement of multiple stakeholders the problem of confirmation and overconfidence bias could be alleviated since many different perspectives are present in the board rooms. In addition, increasing the number of groups, via multiple boards introduces contrary views to counter group think. By installing several boards, the decision making process can be decomposed, so that conflicting information can be surfaced and group think and group shift tendencies can be countered. Finally, by installing multiple boards it becomes possible to establish checks and balances that limit power and its self-serving properties.
While we acknowledge that some limited specialization of decision making labor is achieved by unitary boards when they form sub-committees to consider matters such as audit, remuneration, and nomination, using subcommittees does not remove the problems of group dynamics or alleviate information overload, as the same individuals are usually members of the overall board as well. Also, since there are no inherent checks and balances on the unitary board, director’s power to deal with conflicts of interests remains untouched.

Tricker (1994) specifies five tasks for a unitary board. Two tasks are “conformance” functions of: (i) External accountability to stakeholders; and (ii) Internal supervision; with two “performance” functions tasks of (iii) Long term strategic thinking and (iv) Internal corporate policy. The fifth task is to appoint and remunerate the chief executive. It is possible to introduce multiple boards that each deal with one of these five task independently.

In Mondragón employee controlled banks, for example, the decomposition of decision making labor is spread across five different types of boards involving all stakeholders (see Table 2). Each board is constituted in different ways to undertake different functions. The supervisory board is elected by members and determines long-term strategic direction with engagement and feedback to and from strategic stakeholders of the enterprise. It also appoints the management board, while the social council determines working conditions, welfare and profit sharing policies. Work units of 10 to 20 members determine relative wage rates and appoint a delegate to the social council. A watchdog board of three people provides oversight on the efficacy and integrity of governance processes including control of the auditor. Finally, the management board orchestrates the efficient allocation of resources (Turnbull, 1995).

In these ways all employees and selected strategic stakeholders become involved in the decomposed decision making labor to reduce information overload.
The example of Raiffeisen Banks in Switzerland and Germany demonstrate that governance tasks can also be divided among geographical areas (see Eckart, 2005). All of the boards Raiffeisen have similar functional tasks, but each of them have a specific regional focus. A constitution establishes checks and balances between the boards. Whether board tasks are split up according to function or geography, both ways reduce the risk of information overload, and enhance information processing capabilities.

Proposition 2: Include multiple Stakeholders on multiple boards to increase information processing capabilities and counter the detrimental effects of information overload and group dynamics.

NETWORK GOVERNANCE

To summarize our argument, we claim that before and during the financial crisis 1) directors’ information needs were not met, because of limited information supply and restricted information access, and 2) their information processing capability was insufficient, because of information overload, group dynamics, and lack of control. That mismatch led to poor outcomes in terms of risk management (see Table 3). We further hold that the problem is structural in that unitary boards do not support directors in their information processing well. We therefore suggest to increase the information supply to the board level, by including
multiple key stakeholders, and establishing multiple specialized boards to increase
information processing capability.

Our conclusions fit with the analysis provided by Jones et al. (1997), which claim that the
network form of governance is a response to exchange conditions of asset specificity,
demand uncertainty, task complexity, and frequency. When these conditions are in place,
such as before and during the financial crisis, the network governance form has advantages
both over hierarchy and market solutions. Building on the definition provided by Jones et al.
(1997) we propose the following conceptualization of network governance as a process
involving a select, persistent, and structured set of autonomous boards representing specific
stakeholder constituencies.

To exemplify such a process we wish to propose the following generic structure for network
governance in the banking industry. As can be seen in Figure 1, the structure is based on a
division of labor and a division of power. Multiple stakeholders are included to divide labor
and create checks and balances. Shareholders elect the supervisory and management board,
as well as the watchdog board. The watchdog board would have the power, e.g., to invite
stakeholder councils to suggest key performance indicators for appointing and remunerating
executives on the management board. Employees, Creditors (suppliers), and Debtors
(clients) form assembly boards which appoint or elect representatives to a stakeholder
congress. The stakeholder congress provides feedback to the supervisory, management, and
watchdog board, as well as the shareholders. The other boards provide further feedback to
Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View

each other. In that manner, information processing needs of the board members can be met.
By dividing the labor information processing capabilities are enhanced. By providing checks
and balances, e.g. between the watchdog and the management board, risk management can be
enhanced.

Whereas usually employees and debtors have the knowledge to act, creditors have the interest
or incentive to act, none of these groups have the power to act. In the network structure, all of
this knowledge can be harnessed for better information processing, since structures provide
those with knowledge to act with channels to support those with interest to act.

CONCLUDING REMARKS

It is conceivable that the financial crisis of 2008 may have been significantly mitigated if not
avoided if network governance of sufficient richness was present in 25 of the largest US
financial institutions. Network governance could at least have exposed firms, their
stakeholders and regulators to risks earlier. That would have provided those at risk with the
information, incentive, and capability to take mitigating action. Gordon (2009) similarly
concluded that: (i) the 2008 financial problems could have been anticipated, (ii) something
could have been done to avoid the problems but (iii) there was not the capability to take corrective action.

Network governance proves superior to unitary board governance especially in complex and uncertain environments, because it uses the underutilized resources of stakeholder loyalty and commitment to the business. Stakeholders can be a source of competitive intelligence, product and/or service quality knowledge and innovational opportunities (von Hippel, 1994), as well as firm-specific and industry knowledge. The introduction of network governance reduces the problem of information overload, introduces checks and balances on risky or corrupt practices, and can be used to create a requisite variety of communication and control channels to improve reliability and enhance performance. In these ways systemic communication and control deficiencies of a unitary board can be mitigated with the decision making work load and accountability spread over many more people with greater knowledge, incentive and authority to take corrective action.

However, the idea of changing the governance architecture of business and its regulation by introducing additional boards is rarely considered in practice (see e.g. Bebchuk & Weisback, 2010). Network governance at first sight is a counterintuitive concept. By engaging stakeholders actively and making them *de facto* co-controllers, complexity is increased. However, complexity is increased only on the structural level. On the individual level complexity is decreased, and the problems of information overload are kept in check. By introducing a network of controllers, data processing and decision making labor is decomposed into manageable components to provide a more detailed, knowledgeable, responsiveness and nuanced basis for decision making.
REFERENCES

ACCA 2008. **Climbing out of the credit crunch.** London: Association of Chartered Certified Accountants.


Bernanke, B. 2009. **Lessons of the financial crisis for banking supervision.** Speech presented to Chicago conference on bank structure and competition.

Bezemer, D. J. 2009. **No one saw this coming: Understanding financial crisis through Accounting models.** MPRA paper 15892, available at http://mpra.ub.uni-muenchen.de/15892/.


Corporate Governance, Risk Management, and the Financial Crisis - An Information Processing View


Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View


Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View


Corporate Governance, Risk Management, and the Financial Crisis-An Information Processing View


TABLE 1
Communication errors in a chain of command
Follows the analysis by Downs (1967:116-118)

<table>
<thead>
<tr>
<th>HIERARCHY</th>
<th>INFORMATION UPWARDS</th>
<th>EMPLOYEES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volume (50% lost/</td>
<td>Correct (85% of lower level)</td>
</tr>
<tr>
<td></td>
<td>level)</td>
<td>Missing or wrong meaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numbers with a span of control of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>say 5 persons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Level</td>
</tr>
<tr>
<td>Public or private sector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legislature/Ministers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shareholder(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board of directors</td>
<td>3.1%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Chief Executive Officer</td>
<td>6.3%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Senior management</td>
<td>12.5%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Middle management</td>
<td>25.0%</td>
<td>18.1%</td>
</tr>
<tr>
<td>Team leaders</td>
<td>50.0%</td>
<td>42.5%</td>
</tr>
<tr>
<td>Workers</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>625</td>
<td>781</td>
</tr>
</tbody>
</table>
TABLE 2

Mondragón compound board compared with a unitary board
(Degrees of decomposition of data processing labor indicated by allocations of "X")

<table>
<thead>
<tr>
<th>Board type:</th>
<th>Mondragón compound board</th>
<th>Anglo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control centers&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Watchdog Council</td>
<td>Supervisory Board</td>
</tr>
<tr>
<td>Members</td>
<td>3</td>
<td>5-8</td>
</tr>
<tr>
<td>Function&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Governance processes</td>
<td>Appoint mgt. board</td>
</tr>
<tr>
<td>Activities</td>
<td>Efficacy &amp; integrity of processes</td>
<td>Integrate strategic stakeholders</td>
</tr>
<tr>
<td>Internal&lt;sup&gt;b&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>External&lt;sup&gt;b&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Short term&lt;sup&gt;b&lt;/sup&gt;</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Long term&lt;sup&gt;b&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<sup>a</sup>Omits the General Assembly, which elects Watchdog Council and Supervisory board.

<sup>b</sup>Descriptions follow typology of Tricker (1994: 244 & 287) with typical number of people involved in each board.
### TABLE 3

Overview of Main Arguments

<table>
<thead>
<tr>
<th>Information Processing View</th>
<th>Director's Problem</th>
<th>Potential Remedy</th>
<th>Theory</th>
<th>Corporate Governance Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Needs</td>
<td>Information Access</td>
<td>Lack of control</td>
<td>Increase the number of co-controllers</td>
<td>Ashby (1956)</td>
</tr>
<tr>
<td></td>
<td>Information Supply</td>
<td>Structural Information loss</td>
<td>Install parallel Communication Channels</td>
<td>Shannon (1949)</td>
</tr>
<tr>
<td>Information Processing Capabilities</td>
<td>Information Overload</td>
<td>Establish Division of Labor/Specialization</td>
<td>Taylor (1909), Williams (1979)</td>
<td>Install Multiple Boards</td>
</tr>
<tr>
<td></td>
<td>Individual/Group Biases</td>
<td>Increase Diversity</td>
<td>Kahneman (1982)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of External Control</td>
<td>Establish Division of Power/Checks and Balances</td>
<td>Williams (1979)</td>
<td></td>
</tr>
</tbody>
</table>
Generic example of network governance for banks
Shareholders establishing a watchdog board and stakeholder councils through changing the corporate constitution

FIGURE 1