AN INQUIRY INTO THE NATURE AND CAUSES OF NATIONAL AUSTRALIA BANK FOREIGN EXCHANGE LOSSES

by

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Motto:

“Only a crisis - real or perceived - produces real change.”

Milton Friedman

1. Introduction

In recent years, the number of corporate scandals has increased tremendously. While being a source of distress for shareholders, such corporate problems do create an opportunity for economists to examine corporate governance mechanisms. Scandals in the financial industry also increase the pressure on the government to review the effectiveness and ability of the regulator to fulfill its goals, especially regulatory monitoring. In the financial industry, most of the losses also reveal weaknesses of the risk management (RM) framework.

In particular, the losses incurred by the National Australia Bank (NAB), discovered in January 2004, raise important questions related to the effectiveness of governance and regulation in the financial industry. The losses also gave strong evidence of the importance of implementing adequate RM framework. The loss of A$360 million to the bank's shareholders, which can be attributed to four traders working on the foreign exchange option desk, reveals the potential impact that superficial governance, insufficient regulatory monitoring and inadequate management can have on a financial institution.

Using the losses at National Australia Bank (NAB) as an example, this paper reviews and provides suggestions to improve the effectiveness of corporate governance. The current paper also gives evidence of the difficulties that the regulator faces in monitoring financial institutions and the importance of implementing an adequate risk management structure.

The paper also places some of the responsibility for the losses on the board of directors. In this case, the Board of NAB failed to fulfill its obligations to closely monitor the activity of the Chief Executive Officer (CEO). The Board routinely approved the CEO's proposals and based all of its decisions on the information provided by the management. The management's role in allowing such losses to occur is not negligible; this paper identifies the weaknesses of the Risk Management (RM) department, partly due to an inactive risk manager and partly due to its flawed design. The CEO allowed the bank to take high levels of risk without appropriate risk management policies and supervision. With respect to the regulator's performance, the results are mainly negative. This paper finds that the regulator's inability to prevent the losses was mainly due to insurmountable informational asymmetries. This paper concludes that under these circumstances (i.e., lack of adequate information), the regulator's optimal strategy is to perform comprehensive audits (which did not happen in the NAB case) by well-prepared specialists and to encourage the risk management department and the board to perform their intended tasks.

The organization of the paper is the following: chapter 2 and 3 present relevant issues from the governance and regulation literature, respectively. Chapter 4 presents a brief outline of risk management best practices. Chapter 5 presents details of the foreign exchange losses at NAB. The sixth chapter presents details about the failures of the management, the board and the regulator to prevent the losses and a brief outline of similar losses at other financial institutions. The seventh chapter concludes.

2. Governance

2.1. Definition of governance

This chapter provides a brief outline of corporate governance issues, and it is necessary in order to understand the nature of losses at NAB.

Corporate governance is a new and fascinating topic in economics. This term refers to the mechanism that bridges the ownership and management parts of a corporation. The main component of corporate governance is the board of directors, which represents owners' interests and it is entrusted by the shareholders to determine management compensation, set the corporate rules, provide high counsel to the management, give its approval on major projects, and replace the CEO if necessary.

While the governance issues were first discussed by Adolf Berle in early 1930s, recent failures of corporate governance in highly publicized cases forced the regulators and the shareholders to change some of the rules relating to the composition of the board and its relationship with the management. As a consequence, the directors are expected to meet more often than in the past and to closely monitor the management.

2.2. The need for corporate governance

The corporate governance issue is not present if the owner is also the manager of his or her company. The governance issue becomes important in an organization when two prerequisites are met: firstly there is an agency problem, usually a conflict of interests between shareholders and management and secondly the transaction costs do not allow the problem to be resolved through a contract between the two interested parties.

A full contract specifies the obligations and recompenses for the parties in any possible future state of the world. If the contract has to specify decisions that depend on the realization of some future events, writing a full contract becomes virtually impossible. The transaction costs that would make the parties agree through a contract are:

- the cost of thinking about all possible states of the world that can appear during the contractual term,
- the cost of negotiating with the other parties about the obligations of the parties in every case, and
- the cost of writing down the contract in such a way that an outside party can enforce the contract in case of a dispute (e.g. a judge).

These high costs result in incomplete contracts and also an additional structure of corporate governance, which is delegated by the shareholders to take future decisions on their behalf.

2.3. The board of directors

The board of directors is the crucial component of corporate governance.[1] It is the representative of shareholders' interests in front of the management. The board must monitor the management, give its approval in major decisions and promote good governance rules. These requirements are motivated by the fact that managers are self-interested individuals that can overpay themselves, give themselves perks, pursue power enhancing investments with negative present value, entrench themselves, continue to employ unproductive workers or technologies.

In practice it is difficult to determine the quality of managerial work, since the only thing that is observable is profit, which is a function of manager's effort and a noise term. Therefore, the CEO's compensation will be a function of the realized profit. This dependence on profits must be set, by the board of directors, in a way that generates a trade-off between financial incentives and risk. A manager must be given financial rewards to work hard, therefore the pay should be sensitive to profit. On the other hand, the manager should also be protected from downside risk (i.e., losses on new ventures), otherwise the manager will not try to invest in new projects, but will maintain the status quo. Determining the compensation for the CEO is not easy, but a good contract with the management reduces the task of the board since most of the CEO's interests are aligned with shareholders' interests of profit maximization. However, Fama (1980) suggests that once the contract is signed, the CEO has incentives to do less work then necessary, therefore the board has additional reasons to be vigilant.

[1] Other components of corporate governance are the rules adopted by the board and the board committees

The Board of Directors consists of executive directors, which are members of the management and non-executive or independent directors.

In some cases, shareholders will monitor the management, especially if they own a significant portion of the shares, but bad regulation reduces shareholders' incentives to monitor the management. In United States (US), for example, before 1992 it was illegal for a shareholder to discuss company matters with more than 10 other shareholders without prior written approval from the Securities and Exchange Commission (SEC). This limiting regulation was in place to restrict proxy fights. This requirement has since been relaxed - now the shareholders owning each less than 5% of the total shares can discuss company matters among themselves. Similarly, other restrictions imposed upon corporate investors[2] suggest that dismantling limiting regulation is a prerequisite for increasing the quality of corporate governance.

Despite the fact that sometimes the shareholders will monitor management decisions, in reality the majority of shareholders is not involved in the daily decisions of the firm. The main reasons are that monitoring is expensive and that any improvements that appear as a result of individual vigilance are divided among all the shareholders. Therefore, in this game theory setting, the optimal strategy pursued by the typical investor is to not monitor the management, in the hope that another shareholder will monitor. As a consequence, the board of directors will monitor the management on behalf of the shareholders.

[2] Black (1990), Jensen (1993), Becht, Bolton and Roelle (2001)

2.4. Practical problems with board of directors

In practice the vast research has emphasized many practical caveats with the board's performance. The corporate control has two main problems, namely it reacts too late in case of serious problems and secondly, it takes too long to produce major change. The executive directors have no incentive to criticize the CEO, while the non-executive directors may not be doing a good job for different reasons. They may not have a high stake in the company, so they can derive no significant benefits by performing a thorough monitoring activity. Also the independent board members are usually busy people who lack the time to get relevant information or think about the company. Similarly, they may owe their presence in the board to the management so they will have little incentives to criticize it. Another obstacle in good monitoring is the informational asymmetry between the management and the non-executive directors. The management will have great incentives to keep some of the negative information private.

Jensen (1993) suggests that "the job of the board is to hire, fire and compensate the CEO, and to provide high-level counsel". The vast literature in corporate governance claims that "very few boards have done this job well in the absence of external crises".

Becht, Bolton and Roelle (2001) found that the effectiveness of the board decreases over time as the board members are socialized by the management. Similar problems are mentioned in Jensen (1993). The CEO increases its power by encouraging a culture of "politeness and courtesy at the expense of truth and frankness". This behavior is a symptom and a cause of failure of the control system. Reduced monitoring power reduces company's performance making "the resulting difficulties likely to be a crisis

rather than a series of small problems met by a continuous self-correcting mechanism"[3]. Also when the firm experiences high profits, the board is completely captured by the management. The board becomes a rubber stamp assembly[4].

Non-executive directors are more active in monitoring than executive ones. The most active non-executive directors are those that have a reputation to defend, such as, respected leaders of the business community and academics.

Weisbach (1987) suggests that if the manager was able to control the board, and as a consequence of the lack of monitoring a crisis ensues, the CEO might resign voluntarily for two reasons. First reason is that it is hard to run a company in times of crisis especially if the CEO did not demonstrate leadership abilities during normal times and the second reason is the fear of shareholder suits.

2.5. Ways to improve the effectiveness of the board of directors

Many of the corporate governance problems were addressed by the Cadbury Committee, which published a "Code of Best Practices" in December 1992. The recommendations of the committee were generally well received by the business world and academics. Among the 19 formal recommendations, the committee proposed the board of directors to ensure that an objective and professional relationship is maintained with the auditors.

[3] Jensen (1993)

[4] Becht, Bolton and Roelle (2001)

The board's efficiency would increase if the number of directors would be less than eight. Similarly the direct subordinates of the CEO cannot be unbiased and have no incentives to criticize the CEO. Weisbach (1987) suggests that boards dominated by non-executive directors perform better and need to have a small number of executive directors such that they would be able to select an able successor for the CEO, Jensen (1993) suggests that the board should not contain any executive directors, but only independent directors. Members of the management should be "regularly invited" to the board meetings but only in an "ex officio capacity".

3. Regulation

3.1 Introduction

Regulation is the use of law to produce different outcomes that would otherwise not occur in a free market. Regulation is pursued by the government in case of market failure. While present in many industries, this chapter will focus on the regulation in the financial industry.

3.1.1. History and theories of regulation

Financial regulation has evolved primarily from the anti-monopoly legislation pursued by the American government in the 1890s. A steep increase in regulation, especially financial regulation, was the consequence of a large number of bank failures during the Great Depression. The Glass-Steagall Act of 1933 separated the corporate and investment banking and also reduced competition in the banking industry due to restrictions on interstate banking. One year later, the government introduced government-backed deposit insurance. Deposit insurance had the effect that the managers of distressed financial institutions took additional risks not prescribed by the risk premia. In order to curb such moral hazard, additional regulation became necessary, namely capital requirements and regulatory monitoring.

The Public Interest Theory was the established economic theory of regulation until 1970s, when results of regulatory policy were reexamined by economists. The Public Interest Theory asserts that the goal of regulation is to correct market inefficiencies

and to increase(maximize) economic welfare. According to this theory, regulation is instituted to protect the customer against monopoly power, correct for market failure or change the incentive system in case of externalities. Deregulation is pursued when the gains that appear as a consequence of deregulation exceed the current regulatory costs.

The evidence against the Public Interest Theory was crystallized in the Capture Theory. In the light of Capture Theory, the welfare of the public is not the goal of regulation, but such policy is pursued by utility-maximizing politicians which try to increase their political power. The politicians achieve this goal by capturing votes through sale of regulation. In view of this theory, regulation is acquired by a certain industry and it is designed for its own benefit. Since the costs of organizing interested parties is very small for people in a small geographic area which have a lot to gain (or lose) – in this case the regulated industry, the large group of consumers which is dispersed in a large geographic area finds it hard to organize and combat the harmful effects of regulation.

While the declared purpose of regulation is noble, Black, Miller and Posner (1978) conclude: “A rapidly growing literature on the economic characteristics and effects of government regulation of business is strikingly negative in its conclusions: Careful evaluations of the regulatory process reveal, time and again, substantial failure to carry out the intended (or ostensible) purposes of the regulatory program at reasonable cost”.

Unfortunately, one of the main consequences of regulation is that regulatory agencies reduce competition beyond their declared purpose. Due to inefficiency, regulation tends to spread into other areas just to address the consequences of the initial regulatory process. Nonetheless, regulated firms are able to evade government control by

reducing quality, output or by diversifying into a unregulated market and using accounting techniques to transfer profits from regulated division to the unregulated one. Other harmful effects of regulation are high social costs and decreased strive for efficiency.

These criticisms of regulation forced governments to change their point of view. Many regulatory restraints were relaxed starting in mid-1980s in many industries, which produced beneficial results for the economy and the consumers.

3.2 Regulatory instruments

In order to promote the soundness of the banking industry, the regulator can use the following instruments: interest rate regulation (e.g. ceilings on interest rate), entry, branching and merger restrictions, portfolio restrictions, deposit insurance, capital requirements and regulatory monitoring.

In a country with a deposit insurance scheme, the regulatory agency needs to closely monitor the banks, due to the fact that banks have incentives to contract risky loan portfolios and present incomplete information to the regulator[5]. The probability that the bank manager will undertake risky investments increases when the bank faces serious liquidity shortages. In this case it is possible that the shareholders approve the very risky behavior on the part of the manager since if the project is unsuccessful, they will not be liable to depositors because of the deposit insurance. The equity holders have an option on firm's value therefore, under these circumstances the value of their position increases

[5] Chan, Greenbaum and Thakor (1992)

with the riskiness of the portfolio. This excessive risk-taking is the so called “gambling for resurrection”.

Despite increasing presence of deposit insurance worldwide, bank failures in the 1980s increased tremendously, especially in United States. Economists attribute this situation to the increase competition following deregulation. Gorton and Winton (2001) notice that most of the failing banks had a disproportionate amount of commercial mortgages, commercial loans and “followed high growth investment strategies”. Bigger and more stable banks were also encouraged to take additional risks and to downplay the importance of cash reserves by the too-big-to-fail policy persuaded by the regulator.

Mailath and Mester (1994) question the ability of the regulator to discipline the banks by taking risks prescribed by the risk premia. The results are mainly negative, in the sense that the regulator cannot push the bank to “play safe”, but can only slightly reduce the bank’s risk appetite due to threat of closure. Also the model shows that the threshold that the bank should pass in order to be closed is very high, while the cost for the regulator, in order to punish the bank, is also very high, given the generous deposit insurance policy. This enforces the view that the regulator is at most inefficient and can at best “pick up the broken pieces”, but can not prevent a catastrophe.

Kane (1990) studies the incentives of the regulators to present the problems to the public. He states that if the regulator is concerned with his or her career, they will have incentives not to disclose the poor health of a bank; therefore excessive capital requirement might be necessary to prevent the possibility of default.

3.3 Motivations of financial regulation

The official justification given for financial regulation is the need to provide a safety net to depositors in case of bank failure. Externalities related to bank failures can be explained by the informational asymmetries between depositors and their bank. In the absence of deposit insurance, depositors test the "soundness" of their bank by early withdrawal. If a significant proportion of customers want to exchange their deposits for cash, the bank will face cash shortages, and will be forced to sell its loan portfolio at a significant discount, which can, in most extreme cases, affect the bank's solvability.

Before the introduction of government-backed deposit insurance, private bank coalitions existed in US and operated very efficiently. Solvent banks facing liquidity shortages could have borrowed cash from the clearinghouse against sound collateral. Mishkin (1992) suggests that private deposit insurance schemes are able to extract and use information more efficiently and consequently, price the insurance premia in accordance with risks therefore, reducing the distorting effect that government-backed insurance deposit has.

3.4. Consequences of financial regulation

The distortions that appear as a consequence of regulation are of two types. Firstly, deposit insurance schemes create moral hazard from the part of the bank managers, especially if the bank has insufficient cash reserves. Chan, Greenbaum and Thakor (1992) suggest that banks in a difficult financial situation are in a position to take

additional risks due to the lag necessary for the deposit insurance corporation or regulator to adjust the risk premia. Their research also suggests that due to informational asymmetries, the regulator is never able to price the risks fairly. Under these circumstances, the regulator will try to force the banks to internalize some of the costs associated with taking inappropriate levels of risk. These costs to banks are represented by the regulatory reserves that will act as buffers in case that the bank runs into financial difficulties. Kane (2003) considers that the regulators are unable to adapt to fast changes in the financial world, but that there are positive signs that regulators are trying to reduce regulatory inflexibility and re-regulate in order to address some well-known issues.

Secondly, "if regulation does not fully exhaust all the surplus created, the government may feel empowered to regulate banks for reasons other than safety and soundness. This may take the form of an implicit tax, as in the case of reserve requirements, or an obligation for the bank to subsidize some of its products"[6]. For example, the Basel Capital Accord requires no capital reserves for the banks' holdings of government bonds. As a consequence, the regulator artificially changes the composition of banks' portfolio toward more government debt.

Banking regulation restricted branching and reduced the risk of insolvency at the cost of reduced competition. According to Black, Miller and Posner (1978), the attempt from the government to ensure the depositors has surpassed the optimal point, produces considerable social costs.

[6] Freixas and Rochet pp. 258

3.5. Basel Capital Accord

The 1988 International Capital Accord, sets the minimum levels of capital required for a bank in order to be considered adequately capitalized. The accord, also known as Basel I, defines two types of capital: Tier-One Capital, which represents stockholder equity, for which the risk weight is 4% and the Tier-Two Capital, which represents quasi-equity positions, for which the risk weight is 8%. Basel I focuses mainly on credit risk and trading risk which are treated separately, therefore the required capital under Basel I overestimates the bank's exposure to risk, because this calculation does not consider the hedging effect of these two risk categories. Some criticism was expressed over the years with respect to Basel I. The main issues were inconvenient regulatory supervision requirements, especially with respect to risk exposure in derivatives and the risk weights, which are set arbitrarily.

These criticisms motivated the Basel Committee to review the Capital Accord. In 1995, the Committee issued a proposal to amend the current Capital Accord. The new Accord, or Basel II provides a regulatory framework based on three pillars: minimum capital requirement, supervisory review process and market discipline requirements. Banks with accurate risk models are allowed to use their internal models when determining the capital reserves. The goal of the supervisory process is to ensure that the banks follow rigorous processes in assessing their risk. Market discipline is used by the regulators to ensure that banks are communicating their capital and risk exposures to the market.

Sam Theodore, the managing director for European banking at Moody's said: "In broad terms, the final Accord is in line with what people were expecting and it is a very positive step. The Accord is not so much about capital as it is about risk management. The Accord is the stamp of approval by the regulators for what banks have been doing for some time."

4. Risk management

Recent changes in the business environment increased the importance of managing the risks that can affect a financial institution. Increased competition due to the elimination of interest rate regulation, floating exchange rates, advances in information technology and a more volatile business and political environment increased the possibility for financial institutions to incur significant losses in a very short time. In order to reduce the magnitude and the probability of such losses, large players in the financial markets instituted separate risk management departments. As a consequence of inefficient monitoring regulation, the governments in developed countries encouraged the activity of the risk management (RM) departments in large banks and financial institutions.

4.1 Typology of risk

The main sources of risk faced by a complex financial institution are market risk, credit risk, liquidity risk, operational risk, legal and regulatory risk. Market risk refers to the possibility that changes in the market might negatively impact the value of banks' assets. Credit risk quantifies the possibility that some assets might depreciate due to a reduction in the credit rating of a borrower. Liquidity risk represents the risk that a financial institution might not be able to transform some of its assets into cash especially during an economic downturn. Operational risk refers to possible losses due to management failures, inappropriate controls or fraud. Legal and regulatory risks are due

to the possibility that a counterpart might sue the bank or that regulation might change against the bank's interests.

4.2 Best practice risk management

The risk management function can be best performed in an organization where some prerequisites are met.

Firstly, a set of best-practice policies is necessary in order to align the business strategy with the amount of risk taken by the bank. The main risk factors must have appropriate policies. The market risk policy must contain the response to the worst case market conditions. The bank must also set limits to the maximum losses allowed for each division. The credit risk policy provides guidelines with respect to the parameters of credit supply, the quality of the customers and the loan profitability.

In order to reduce the impact of operational risk, some measures must be taken. The management must understand the nature of the business they lead. The responsibilities of the business divisions must be clearly stated. The top management and the board must ensure that the weaknesses are addressed quickly. The risk management and internal controls must be independent from the business they control. The risk management department must have independent computer systems that cannot be accessed from outside the department. Also the reporting lines in the risk management department must converge to the head of risk management.

Secondly, the bank must have a coherent set of methodologies that are necessary in order to produce relevant reports. Such methodologies allow the bank to correctly assess its risk exposure.

Lastly, the risk management department must also have an adequate infrastructure. Having well-trained and motivated employees represents the most important part of the risk management infrastructure. The risk management function must be supported by a performing computer system. The risk management must obtain the market information from multiple sources and to strive for the integration of various systems. The department must also revise and improve the existing systems periodically. A best practice is to upgrade the risk management system every three moths.

The portfolio of the bank must be evaluated daily. The profit and loss statements must be presented to senior mangers through daily reports. An escalation procedure must be in place. Any limit must be reported by risk management along with a plan to address the issue.

The Internal Audit has the role to evaluate the design and implementation of the risk management procedures. The Audit reveals weaknesses of the risk management policies and provides suggestions for improvement.

The activity of the risk management department is important for the stability of the bank and for allocating the economic capital efficiently.

5. NAB foreign exchange options losses

5.1 Introduction

The National Australia Bank (NAB) is the largest bank in Australia. Since establishing in 1893, NAB has grown substantially. Currently it employees over 45,000 people, serves 8 million customers annually, has a market capitalization of A$45 billion and its assets are evaluated at A$400 billion. One of the key features of NAB is its significant presence in overseas operations, especially in United Kingdom, New Zeeland and South-East Asia, which produce over half of its profits.

The second largest retail bank in Australia is Commonwealth Bank of Australia (CBA) with a market capitalization of A$ 39.1 billion and 35,800 employees.

The Australian Provincial Regulation Authority (APRA), established on July 1, 1998, supervises the financial institutions in Australia. APRA's first responsibility is to protect the depositors and policyholders of banks and insurance companies by establishing and enforcing prudential standards and practices. However, APRA recognizes that the management and the board are chiefly responsible for the soundness of the supervised institutions. APRA introduced a new Probability and Impact Rating System (PAIRS) in October 2002. PAIRS assesses the risk of failure of a financial institution and the potential impact that such a failure.

While being one of the most profitable Australian corporations, NAB was subject to many public scandals in the recent years. In 2001 the bank had to write off A$4 billion due to losses at Homeside, the bank's mortgage subsidiary in US, due to a sharp

decrease in interest rates. While never admitted publicly by the bank's officials, Homeside did not properly hedge its exposure to changes in interest rates. In early February 2002, another NAB subsidiary, Allied Irish Bank, started an internal investigation into a currency trading fraud, which will turn out to be the biggest rogue trading scandal since the highly publicized failure of Barings bank. Allied Irish bank lost $700 million (A$ 1.3 billion) due to the activities of one of its foreign exchange trader, which took speculative positions on the currency market. The trader was able to hide his losses for years due to his ability to create fictitious option trades which went undetected by the risk management department.

This paper focuses on the most recent financial scandal at NAB. In early January 2004, the bank realized that four traders in the Foreign Exchange Options Desk overstated the real value of the NAB portfolio by entering false transactions in the computer system. The portfolio was overstated by A$ 185 million, but closing the desk's position produced additional losses of A$ 175 million.

5.2 NAB business organization

5.2.1 Corporate and Investment Banking

The foreign exchange (FX) business is part of the Global Markets department of the Corporate and Investment Banking (CIB), and it is divided into the Currency Foreign Exchange Options desk and the Spot Foreign Exchange Desk. At the time the losses occurred, the currency options desk consisted of seven people including the four traders involved in the scandal.

CIB is the division of NAB that has business relationships with corporate clients, governments, other banks and financial institutions. CIB currently employs 2,600 people and generated A$ 877 million (20 % of NAB profits) before tax in 2003.

The Operations division in CIB reports directly to the Head of CIB. The role of Operations is divided into various desks that align with the different trading desks. The team responsible for currency options consisted of four employees. This organizational arrangement is not compatible with the established best practices of risk management, which require independence of the Risk Management (RM) department. The fact that the Risk Management desks reported to the head of the CIB reflects inappropriate business unit design, since the head of the department had incentives to disregard the risk in order to achieve the profit targets.

NAB also had an “enterprise-wide” Risk Management group, which at the time the losses occurred was led by Chris Lewis. The Risk Management Department had the role to overview and monitor the risks to which the bank is exposed to. The Market Risk

and Prudential Control (MR&PC) division within Risk Management was responsible for measuring and reporting the risk arising form the Market Division of CIB, including checking the transactions recorded in the foreign exchange trading system (Horizon). MR&PC considered that they had no mandated authority to enforce limit compliance, but only to advise the head of CIB of the potential risk issues. The fact that MR&PC was not aware of its responsibility to enforce the compliance to the established risk limits shows that NAB did not take any measures to improve its control framework, especially after the bank suffered serious losses at its Allied Irish Bank subsidiary in 2002. Instead, the desk limit excesses had to be approved by the desk head or other mangers in CIB.

5.2.2. The board and risk committees

Before January 2004, the NAB Board was comprised of 9 non-executive directors and two executive directors: the CEO Frank Cicutto and the Head of UK operations, John Stewart. Stewart was hired by NAB in August 2003 (see Annex 1).

The Board was supported by two Board committees: the Principal Board Risk Committee (PBRC), chaired by Graham Kraehe and the Principal Board Audit Committee (PBAC), chaired by Catherine Walter. The CEO was receiving reports from the Corporate and Investment Banking (CIB) executive manger Ian Scholes, from the risk manager Chris Lewis and from other executive general managers.

In addition to the Board Risk Committee (PBRC), three additional executive bodies have the goal to address and improve the quality of the risk management, namely the Group Risk Forum (GRF), the Central Risk Management Committee (CRMC) and the

Risk Management Executive Committee (RMEC) of Corporate and Investment Banking (CIB). The principal executive body is the Group Risk Forum, which has a strategic risk policy making role, and is supported by the CRMC, which has an operational focus.

5.3. Producing the losses

The traders responsible for this scandal are Luke Duffy, David Bullen, Gianni Gray and Vince Ficarra. The four traders, also referred as the Traders, were supervised by Gary Dillon, the Joint Head of Foreign Exchange (FX).

The Head of FX Options Desk, Luke Duffy, the FX Options trader Gianni Gray and their direct boss, Garry Dillon, worked together at the Currency Options Desk of the Commonwealth Bank Of Australia (CBA). NAB hired Garry Dillon, in August 1998 as Head of the Currency Options Desk. A couple of weeks later, Luke Duffy was hired as well. Gary Dillon and Luke Duffy were in good relations. Gianni Gray was hired in 1999 and David Bullen was hired in 2000.Luke Duffy and David Bullen were promoted when Gary Dillon became co-head of FX. Garry Dillon designed and created the NAB's currency option risk management system, while Luke Duffy worked on the design and implementation of the in-house computer system, working on the front, middle and back ends as well as the systems accounting[7].

The Traders were all young. At the time the losses were discovered, Luke Duffy, the Head of the Foreign Exchange Desk was 34, and David Bullen was 31. The Traders were very loyal to Gary Dillon, which in turn gave the Traders a sense of security

[7] crickey.com

and an attitude that they were untouchable and infallible[8]. Figure 1 below presents the management chart for the currency options desk before January 2004.

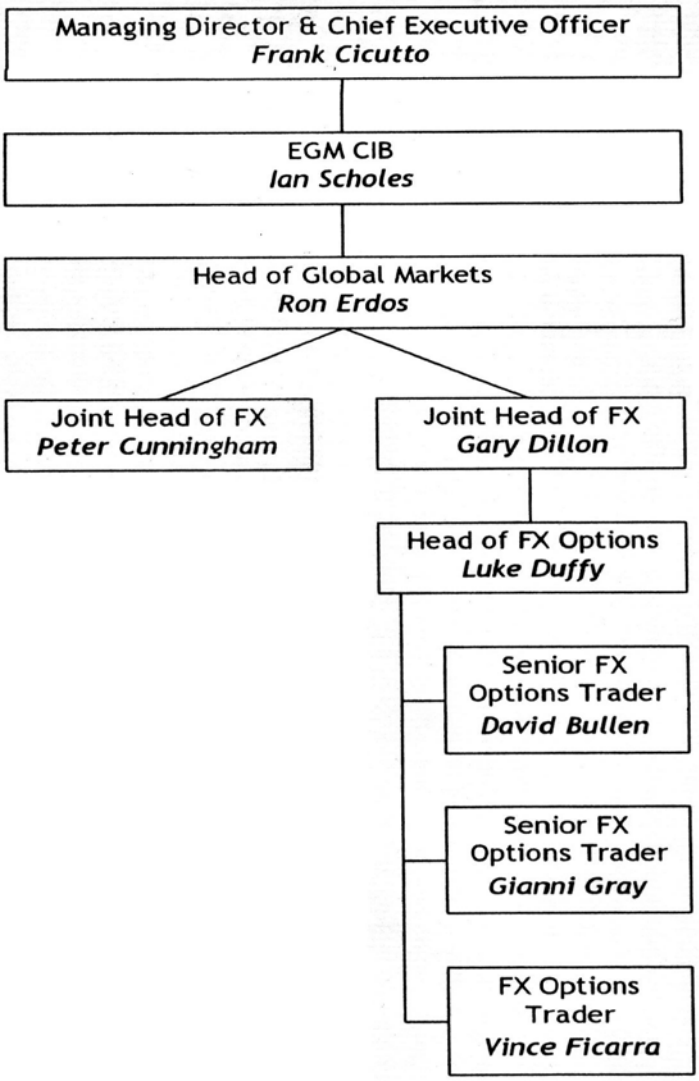

Fig1: Management chart for the currency option desk before January 2004 (Source: APRA report)

Luke Duffy, also known as Big Luke - at 2m tall and 120kg- was especially intimidating. The traders had little contact with other employees of the bank, the group being described as a "secretive clique"[9].

[8] The Age, January 21, 2004

The Traders were in conflict with the Market Risk and Prudential Control (MR&PC) department in CIB for years. The nature of the conflict between the Traders and MR&PC was the tendency of the Traders to breach the credit limits and to trade products without the Risk Management's approval. Due to poor design of the Risk Management department, and due to the constant support that the Traders received from Mr. Dillon and from the Head of Global Markets in CIB, the actions of MR&PC were constantly frustrated by the CIB management, which was officially entitled to coordinate the activity of MR&PC. Under these circumstances, MR&PC could not even enforce the risk limits. As a consequence of this tension, one employee of MR&PC was forced to change its position in the bank.

The team constantly reported monthly profits by recording false or incorrect transactions in the computer system. This practice, commonly known as smoothing, consists in recording false profits during bad months, while presenting lower profits during good months, in order to offset the false profits recorded during bad months. In order to overstate the value of the bank's portfolio, the Traders used incorrect rates or other parameters (such as the volatility smile) in order to increase the book value of the derivatives, or just made up one sided transactions (theoretically with other divisions of NAB). While there is evidence that smoothing was practiced in 2001, the Australian newspapers suggested that the Traders started to "smooth" the profits since 1998. The Australian newspaper The Age also suggested that the portfolio reevaluation of the options desk at CBA, after Duffy left, produced an A$ 10 million write off.

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[9] The Age, January 21, 2004

The NAB strategy as outlined in the 2003 plan was to move away from proprietary trading and focus more on sales to corporate clients. Despite the official strategy, the amount of proprietary trading increased tremendously in 2003. At the end of September 2003 the notional amount of FX options owned by NAB was A$ 253 billion.

Since the Traders reported false profits in 2002, at the end of September 2002 the desk's position was overstated by A$ 7.9 million. The profit in October 2002 was A$ 8.9 million, which allowed the Traders to report a profit of A$ 974,000, therefore eliminating the overvaluation of the portfolio. However, reporting false profits in the subsequent months of 2003, the portfolio misstatement reached A$ 5.5 million at the end of August 2003.

In September 2003, the desk increased the exposure to USD from a long spot equivalent position of A$ 8 million to a long equivalent position of USD 271 million. A four cents decrease in the value of the US dollar produced losses of A$ 34.8 million. Following the report of the G7 meeting on September 20/21, 2003, the Traders assumed that the request of the US Government for more flexible exchange rates between USD and the Asian currencies would produce an appreciation of the US dollar.

Reducing the exposure to USD allowed the Traders to obtain A$ 13.4 million profits in October. However, during November and December 2003, the traders bought USD despite the decline of USD versus the Australian dollar. The Traders produced A$ 4 million in November 2003, but in December of 2003 they increased the exposure to US dollars from 363 million to 1,548 million.

The trajectory of the long portfolio in USD and the spot exchange rate can be observed in Fig 2 and Fig3. The cumulative actual and reported profits are summarized in Fig 4.

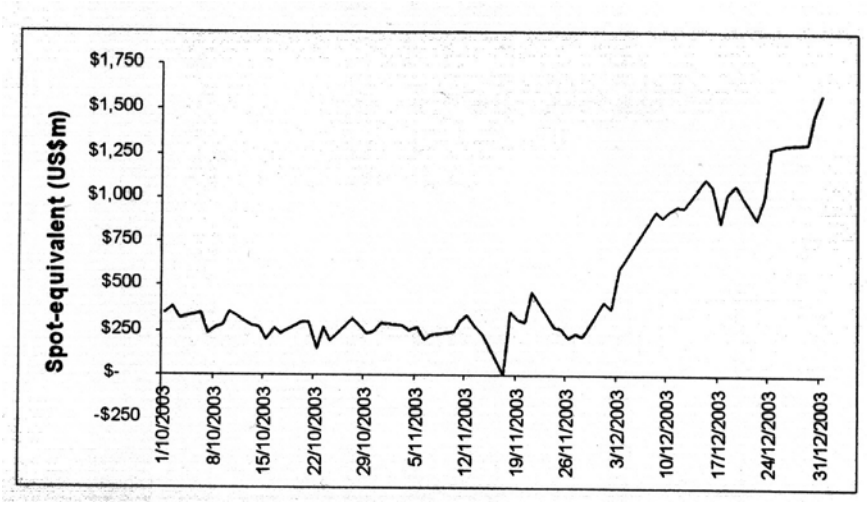

Fig 2: USD spot equivalent exposures of the currency options desk, October 1, 2003 to December 31, 2003 (source: PwC report) Note: the date is in the format dd/mm/yyyy

By the end of 2003, the losses amounted to A$ 92 million and a large USD position. By January 9, 2004, the USD declined 2.5 cents vs. the Australian dollar, producing further losses amounting of A$ 85 million. A total misstatement of A$ 185 million was recorded in the Horizon system (the currency option trading system) at this time.

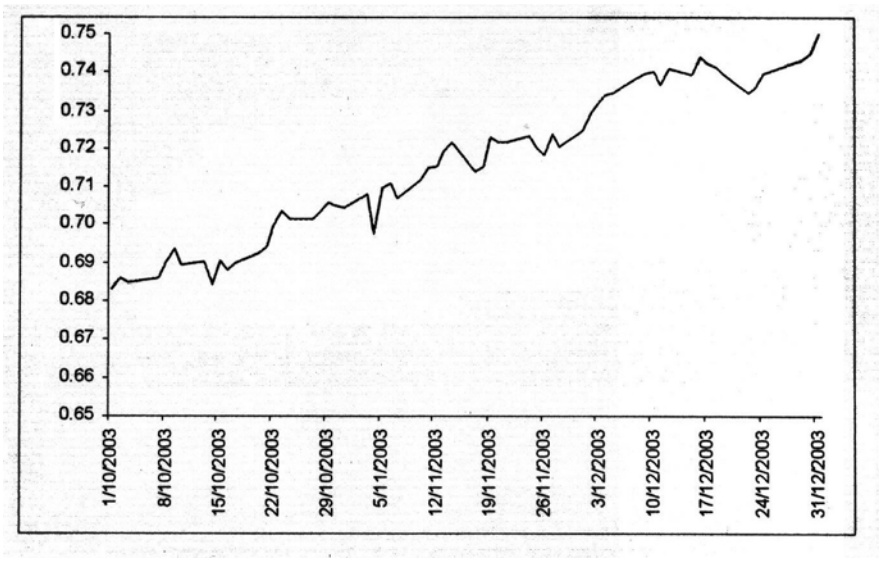

Fig 3: Australian Dollar vs. the US dollar October 1 2003 to December 31, 2003 (source: PwC report) Note: the date is in the format dd/mm/yyyy

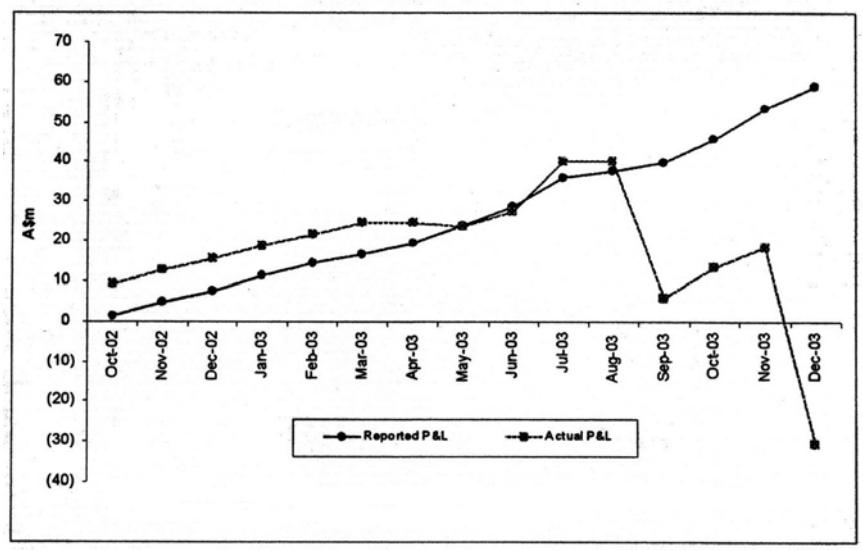

Fig 4: Cumulative and reported results for the currency options desk from October 2002 to December 2003 (source: PwC report)

5.4. Concealing of the losses.

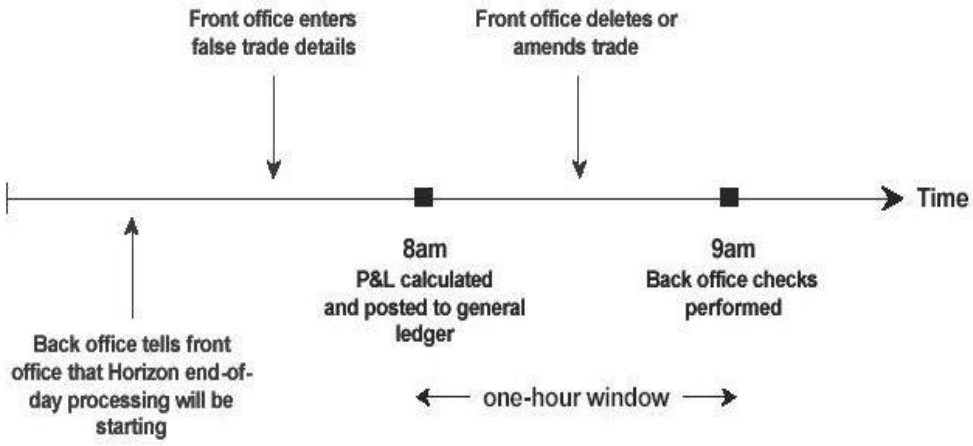

Fig 5: Horizon processing timeline (the "one-hour window") (source : PwC report)

Horizon is the currency options trading and processing system used by NAB. It is an in-house system designed by Mr. Dillon and Mr. Duffy. Luke Duffy also worked on the implementation of front, middle and back ends as well as on the systems accounting. As a consequence, Mr. Duffy was very knowledgeable of the nature of the information that reached the Risk Management department. One weakness of the Horizon system, exploited by the Traders, and presented in figure 5, was related to the end-of-day procedure, which was usually run at 8 AM, in order to capture the trades in New York. The Traders entered false transactions before 8 AM. The profits and losses arising from Horizon are posed to the general ledger and are used for management reports. At around 9 AM, the Operations (back office) started to check the transactions. In the time interval from 8 AM to 9 AM, the "one-hour window" the Traders had the chance to amend any "incorrect" details, therefore escaping the checking by the back office.

In October 2003 Mr. Duffy suggested to the junior staff in Operations that they were not required to check the integrity of the internal transactions. The operations staff did not present this request from the Traders to their managers, and stopped checking the internal transactions.

As a consequence, the Traders started to record false one-sided transactions. These transactions were recorded at off-market rates. These false transactions were subsequently "surrendered". Surrendering a transaction in the Horizon system leaves the transaction in place, but reverses the accounting and suppresses it for some reports. The Traders used to record false one-sided internal options, which were also surrendered in the one-hour window. On November 6, the Traders realized that the back office was not checking the internal transactions, which allowed them to delay surrendering the transactions. The internal options were surrendered before maturity in order to avoid a cash settlement that would discover that the transactions were not legitimate. Other incorrect transactions were genuine spot transactions at off-market rates, recorded before 8 AM. The rates were later amended to the real rates during the "one-hour window". The Traders also used incorrect rates in evaluating the portfolio. The PwC report identified 467 false internal spot transactions and 78 false internal options in 2003.

Being able to achieve end-of-year financial targets using false transactions before September 30, 2003, the traders were entitled to receive performance bonuses. Luke Duffy received A$ 265,000, David Bullen A$ 215,000, while Gianni Gray and Vince Ficarra received A$190,000 and 120,000 respectively.

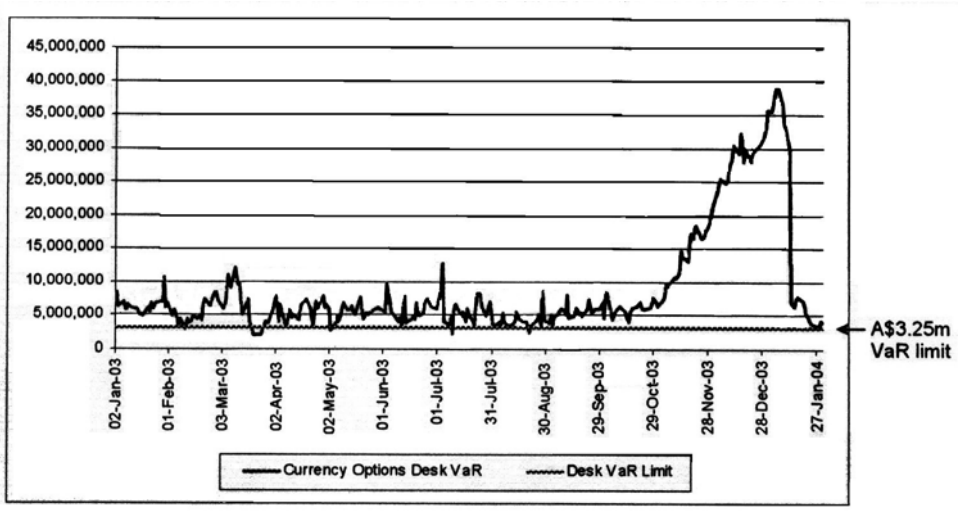

Figure 6: The calculated VaR for the Currency Options Desk (Source: PwC report). Note: Date is in the format dd/mmm/yy

The Foreign Options Desk had an approved VaR limit of A$ 3.25 million. However, Figure 6 above shows that the desk was constantly breaching the approved VaR limit with no consequence. Best risk management practices suggest that under such circumstances, RM department should produce an exception report along with an explanation and an action plan to remedy the situation. Due to poor risk management policies, the daily limit breaches were communicated and approved by the direct supervisor of the Traders, Mr. Dillon. At various other times the limits were approved by the Head of Global Markets, Mr. Erdos.

Figure 6 shows that the daily desk VaR was exceeding A$ 10 million in early November 2003. The VaR increased until it reached a peak of almost A$ 40 million at the beginning of January 2004, with no escalation to higher levels of management. Risk Management did not take any action in investigating the nature of the transactions. Contrary to the situation, in December 2003, Mr. Lao, the Head of MR&PC presented a

letter to APRA that suggested that NAB was introducing a new policy to deal with the limit breaches. The letter did not present any reference to the limit breaches.

5.5. Discovering the losses

The losses were discovered by an employee supporting the Foreign Exchange Options Desk, following a discussion concerning the risk exposure of the desk with another trader on January 9, 2004. This concern was carried forward to Gary Dillon, the Traders supervisor. On January 12, the Head of Corporate and Institutional Markets, Ron Erdos was informed about the losses. On January 13, 2004, the Traders were suspended and the scandal was brought public. At the time the portfolio of the bank was overestimated by A$ 185 million. Management's decision to quickly unwind the risky portfolio produced a further A$ 175 million reduction in the desk's portfolio. The outspoken trader David Bullen, in an interview with Australian Broadcasting Corporation (ABC), declared that they (the Traders) could have closed the positions in a more cost-efficient manner. In the same interview, Bullen criticized NAB management and Risk Management by declaring that their direct managers, two levels above, were aware of their risk exposure but took no action.

5.6. Consequences of the scandal

The foreign exchange losses were released to the public on January 13, 2004. PricewaterhouseCoopers (PwC) was appointed by the CEO of NAB to investigate the facts and the institutional failures that allowed the losses to go undetected.

Despite widespread criticism from shareholders and institutional investors, the Board was behind the CEO keeping his position. Though, additional information related to the failures of the management to prevent such losses, determined the CEO, Frank Cicutto to resign on February 1, after 37 years with the bank.

The Board appointed the other executive director, John Steward, as the new CEO. The Chairman of the Board, Charles Allen has resigned in mid February 2004. Graham Kraehe, the Head of the Risk Committee, was appointed as the new Chairman of the Board.

Simultaneous to the PwC report release in March 12, 2004, the newly appointed CEO, John Stewart, used this occasion to show his willingness to address the issues outlined in the report. Four managers were dismissed: Gary Dillon, the supervisor of the Traders, the Head of the Market Division in CIB, Ron Erdos, the Executive Manger of CIB, Ian Scholes and the Head of Risk Management, Chris Lewis.

Among other identified NAB failures, the PwC report criticized the activity of the Audit Committee. Ms. Catherine Walter, the Head of PBAC, considered the criticism unfair and accused the new Chairman, Graham Kraehe of interfering with the PwC probe. Ms. Walter, a respected Australian corporate law professor, claimed that Graham Kraehe forced the PwC staff to change the contents of its report and to delete some significant

parts of the report from earlier drafts. Ms. Walter's criticism was justified due to the conflict of interest between PwC as a consultant and auditor. Also, the PwC employee in charge of the report, Jim Power, was the relationship manger to NAB since 1998. Mr. Kraehe, the new Chairman of the Board had undoubtedly sufficient power to suggest Mr. Power to present a report that would not damage the NAB image. Mr. Power involvement with NAB could not allow the report to be fair and independent. Many other members of the PwC investigation team worked closely with NAB before the losses were announced. In September 2003 a PwC team investigated some control issues on the Horizon system but failed to discover the weaknesses that allowed the Traders to keep the losses hidden from Risk Management.

The other board members did not publicly support Catherine Walter allegations, therefore her struggle with the other board members was an attempt to reduce the damage that the NAB scandal could have on her reputation.

There is another side to the board infighting. Catherine Walter was supporting KPMG as the bank's auditor, despite its unremarkable work as an auditor and consultant, while Mr. Kraehe and other board members were supporting PwC. At the time the scandal became public, the newest Board member was John Thorn, a retired PwC partner.

As a consequence of Ms. Walter's allegations, the Board called for an independent inquiry. The results of this inquiry, the Blake Dawson Waldron (BDW) report refuted Ms. Walter's accusations. However, the Blake Dawson Waldron report cannot be credible since there is evidence that earlier drafts of the PwC report circulated among the board members. The Blake Dawson Waldron report suggested that despite A$ 17 million consulting fees in 2003, PwC produced a "fair and balanced" report. A

negative Blake Dawson Waldron report would create great problems for BDW, due to NAB's far reaching power in Australia.

However there is evidence that the Risk Committee was presented with earlier drafts of the PwC report. Board members were able to change the emphasis of the report and even to ask for some parts of the report to be removed from earlier drafts. Ms. Walter declined the invitation to partake in such a venture and as a consequence, she was harshly criticized for her role as the Head of PBAC, while other board members survived relatively unscathed. As a consequence of the scandal, the Chairman of PBAC, Catherine Walter had to leave the Board.

Also KPMG, NAB's auditor and PwC broke the American auditor independence law. Enacted after the accounting scandals at Enron and WorldCom, the Sarbanes-Oxley Act of 2002, requires that the financial auditor should not have had consulting relations with the audited company.

6. Responsible parties

The current paper shows that the foreign exchange losses at NAB were produced by a series of factors.

- The CEO was responsible for increasing the risks that the bank was exposed to and also for keeping an inappropriate design of the Risk Management department.
- The management did not understand the nature of the transactions promoted by the Traders and failed to monitor the activity of the desk.
- The Risk Management department did not monitor the activities of the desk and also did not enforce the credit limits.
- The regulator also failed to identify and address serious weaknesses in the risk management framework and regulatory disclosure at NAB.

In addition, the PwC did not adequately present the facts surrounding the foreign exchange losses and allowed the board to interfere with their investigation. Such factors are detailed in this section along with a brief section on other financial scandals that prove that the risk management failures are not idiosyncratic to NAB.

6.1. CEO

In 1999, Frank Cicutto took over as the CEO of NAB from Don Argus. Don Argus envisioned an even greater bank. His strategy was to increase the size of the bank by expanding into other geographic markets. The purchase of a mortgage operator was an

essential tool in Mr. Argus strategy to acquire the mortgage processing technology necessary for the NAB expansion into the real estate lending. In 1997, Don Argus requested Mr. Chris Lewis, which at the time was senior partner at KPMG, to verify the accounting information of Homeside Lending. Mr. Lewis advised the NAB management to purchase Homeside for USD 1.7 billion, which represented a 33% premium over the market capitalization. At the time, Frank Cicutto was the chief of American operations.

Serious failures in the risk models surfaced when the interest rate suddenly decreased in US in 2001.Homeside used an erroneous risk model and inappropriate stress testing. The 2001 NAB report mentioned that the mortgage servicing risk could not be covered by any hedge. The losses, which amounted to A$ 4 billion, were consequently covered by NAB. At the end of 2001, Homeside was sold to Washington Mutual for USD 1.9 billion. NAB did not reveal the real cause of the losses and blamed the losses data entry errors and of breakdown of hedging under unreasonable market conditions.

Undoubtedly Mr. Cicutto felt partially responsible for the Homeside losses. Homeside was bought while he was NAB America executive and the losses erupted while he was NAB CEO. Despite widespread criticism, Mr. Cicutto remained the NAB CEO, but realized that his only chance to keep his position was to increase NAB profits in order to make up for the Homeside losses. In the aftermath to the Homeside debacle, Mr. Cicutto said that he wanted a “bank on steroids”. Having 34 years of experience (in 2001) with NAB, Mr. Cicutto assumed that he had sufficient knowledge of the bank and the bank’s business.

Mr. Cicutto encouraged a culture of profits at the expense of prudence. His first move in this direction was the hiring of Chris Lewis in July 2001, just as the first

Homeside losses were surfacing. Mr. Cicutto hired Mr. Lewis, an accountant and consultant from KPMG, as the Head of Risk Management. His career as an auditor and consultant was not distinguished. Repeated audits performed by Mr. Lewis failed to reveal the potential losses that Homeside was exposed to. Mr. Cicutto rightly assumed that Mr. Lewis would be loyal to him and would not cause any problems arising from risk management issues. Mr. Lewis ignored MR&PC warnings with respect to the currency options desk. Mr. Lewis actually hindered the activity of MR&PC and presented misleading information to the Board and APRA.

In the wake of Allied Irish Bank losses, Mr. Cicutto did not take any measures to improve the risk and control framework at NAB, but increased his high growth strategy. In 2002, Mr. Cicutto proudly announced that the record profits of A$ 3.4 billion are the results of his strategy of increasing the bank's presence in the mortgage lending.

In 2002, the mortgage lending business increased by 18 % out of the bank's local business from 2001. At the time Australia witnessed a sharp increase in the value of real estate.

Independent research by the British magazine the Economist suggested that in Australia and Britain the prices of the houses were out of touch with the purchasing power of the citizens, being at least 30 percent overpriced. Two indicators are relevant: price to rent ratio and price to income ratio. Both indicators had greatly increased in the recent years. The Economist warns that, due to low inflation, it is possible that the prices of the houses could decrease significantly in the future. It is estimated that the housing market in Australia could decrease by 20 percent in the near future. In recent years consumption increased significantly (5 percent in Britain, 4 percent in Australia) in the

two countries despite the fact that incomes increased by only 1 percent in both countries. This increase in spending is related to the fact that consumers can obtain higher loans from mortgage lenders when the value of their property increases. It is worth mentioning that many of the failed thrifts in the Savings and Loans scandal in the late 1980's employed similar high growth strategy and a high percentage of mortgage loans. So a decrease in the average price of houses in Australia can potentially affect the revenues of NAB. Firstly they will lose revenue from customers declaring bankruptcy because the value of their property decreases under the value of the loan. Secondly the amount of money lend would decrease if the prices of the houses crash and also the demand for loans would decrease during the ensuing recession.

In the end, Mr. Cicutto's strategy did not work as planned. Right after the losses were announced to the public, Mr. Cicutto stood firm in defending his position. The Board also supported Mr. Cicutto's decision to continue to run the bank. Subsequent information related to the level of management failures forced Mr. Cicutto to resign on February 1, 2004. As mentioned in the governance section, Mr. Cicutto's decision was possibly motivated by the fear of class action suit from the part of the shareholders, or due to his perceived difficulty to lead the bank in times of crisis. Given Mr. Cicutto's 37 years experience with the bank, he definitely had the ability to run the bank, so it appears that the first hypothesis is more plausible.

6.2. Management

The supervision activity of the management reveals serious failures in controlling the Traders' activity. The Traders were not adequately supervised by Mr. Dillon. He signed off the limit breaches on a daily basis.

It is surprising that while the value of the portfolio was decreasing due to the weakening of the US dollar, Mr. Dillon was not able to realize that the Traders could not make profits with a long equivalent portfolio in US dollars.

The Head of World Markets in CIB, Mr. Erdos, failed to enforce the NAB official strategy to reduce proprietary trading. Mr. Erdos focused his supervisory attention to the reported profits and did not try to understand the nature of the transactions of the currency desk nor the risk the bank was exposed to. Mr. Erdos' support for the desk's trading strategy in its continuous struggle with MR&PC suggests that Mr. Erdos considered the Traders as superstar employees, while MR&PC was viewed as "slow, incapable of making decisions and reported irrelevant credit limits".[10]

Mr. Dillon and Mr. Erdos did not understand the nature of the risks present in the transactions performed by the FX Options Desk. They were only monitoring the reported profits. Mr. Dillon and Mr. Erdos allowed the Traders to enter transactions despite MR&PC objections.

Despite the fact that Internal Audit reports were highly critical of the currency options business, Mr. Erdos also signed off or delegated another managers in CIB to sign off the limit breaches without any investigation. The management completely trusted the

[10] PwC report pp. 33

activity of the traders despite multiple warning signals arising from the market. In March 2002 other Australian banks raised concerns about the magnitude of the risk involved in a transaction performed by the Foreign Exchange Options Desk. NAB management did not investigate the allegations, but sent a very aggressive response to the respective bank. Such problems were never reported to the attention of the Board and the CEO. APRA also received the information from the respective bank. As a consequence APRA raised the issue of limit breaches in April 2002, but no other investigation followed. Some of the issues raised by APRA were passed on to the Head of Global Risk Management, Chris Lewis, but the issues related to the limit breaches were not resolved before the losses occurred.

6.3 Risk Management

An adequate risk management framework is essential for a modern financial institution. Unfortunately, NAB had a poor design of the Risk Management department and inappropriate RM policies.

The activity of Risk Management was divided into small units that served the business units. The role of Operations was divided into various desks that aligned with the different trading units in CIB. These desks were reporting to CIB management and to the Group Risk Management. At the time there was not a clear division between the roles of the Risk Management and CIB. For example MR&PC was aware that it had the responsibility to enforce compliance to the risk limits. Due to these problems, risk issues were neglected in order to fulfill the revenue targets.

This organizational arrangement reduced the ability of Risk Management to perform its monitoring role and to be cost efficient. Risk Management was not independent from the monitoring department and obtained many of the key parameters used to calculate the value of the portfolio from the monitored desks. For example MR&PC needed CIB's approval and funds to upgrade its computer system (Infinity). Such situation was in flagrant contradiction with the best-practice risk management policies.

The lack of financial controls was another factor in allowing the foreign exchange losses to occur. Similarly to the design of the Risk Management department, some finance functions were ”embedded“ in the business units and had dual reporting lines.

Significant gaps in back office procedures allowed the losses to go undetected for such a long time. Also the validation procedures did not function properly, allowing the Traders to enter false transactions during the one-hour window. PwC and KPMG reviewed the quality of the Horizon system, but did not reveal any significant weaknesses.

The Traders exploited the alleged inability of Risk Management to produce accurate VaR. As a consequence, the VaR calculation was removed form the first page of the daily risk report in April 2002 but reinstated in January 2004. After three years of conflict between MR&PC and the currency options desk, the reliability of the VaR was finally added on the agenda of the CIB Risk Management Executive Committee in October 2003, but was postponed for January 2004. The management and the Board failed to address such important issue in a timely fashion.

The MR&PC identified some large unusual transactions in early October 2003, a sale of two large in the money options to other bank for a premium of A$ 322 million. The traders explained that the transaction was necessary to finance some other positions. The investigation went no further.

The Traders sometimes entered transactions with new products without the Risk Management approval. MR&PC escalated the issues to Mr. Lewis, but the Traders were not reprimanded.

MR&PC was under pressure from both the CIB management and Mr. Lewis to approve the FX Options transactions but did not do so. Mr. Erdos however approved the transactions despite MR&PC advice.

Severe weaknesses of the Operations in CIB are revealed by the fact that they stopped checking the integrity of the internal transactions following an email from Mr. Duffy in October 2003.

The activity of Risk Management was hindered by Mr. Lewis' failure to escalate the limit breaches and the failure of the FX Options Desk to comply with the established risk management policies. Mr. Lewis also failed to support MR&PC in its conflicts with the CIB management and presented misleading information to the regulator. For example, his February 2003 letter to APRA, Mr. Lewis downplayed the APRA's request to enforce adherence to the risk management policies and to credit limits. In his December 2003 letter to APRA, Mr. Lewis' subordinate, Mr. Lao, also presented misleading information by not reveling the recent limit breaches.

In conclusion most of the best practices of risk management were violated in the NAB case. Firstly the bank' RM department was not independent from the monitored

business. MR&PC needed CIB's approval and funds for upgrading its computer system. The bank did not have adequate risk management policies. NAB did not have adequate escalation procedures of limit breaches nor an adequate operational risk policy. Firstly, in CIB, the managers failed to understand the nature of the business they managed. Secondly the responsibility was not clearly divided between CIB and MR&PC. Thirdly the relevant controls failed to discover or to improve the identified issues. The Risk Management department did not have adequate risk methodologies. The fact that the VaR calculation was not integrated allowed the Traders to claim that the VaR was unreliable and to consequently neglect it. The risk management infrastructure was not adequate. The risk management systems were not integrated and also the Traders programmed and had access to the back office systems. In conclusions, the three pillars of risk management were inadequate to prevent and detect the losses in the early stages.

6.4. The Board

The Board at NAB bears a large part of the responsibility for the losses. According to the theory of governance, boards with a small number of directors, a majority of independent directors and an independent chairman perform better than average boards. The NAB Board met all these prerequisites, but did not monitor the management effectively. The Board lacked the banking experience and was relying on Mr. Cicutto's experience. Mr. Cicutto was able to capture the Board. This result is supported by the fact that shortly after the losses were announced, the Board still supported the CEO. The bank realized record profits in 2002 and 2003 and according to

the theory, the power of the CEO increased during times of high profits. Also the Heads of the two board committees: PBAC and PBRC were directors for a long time and according to the theory, less confrontational. The Board's failure to address the bank's problems is also related to the fact that the board did not meet often enough while the outstanding items on the agenda increased. The Board met seven times in 2002 and eight times in 2003.

A strong and independent Risk Management department would have discovered the losses in the early stages. Therefore, allowing Mr. Cicutto to keep a flowed organizational design for the Risk Management department was the greatest failure of the Board.

The Board's role is to set the "rules of the game" and to make sure that the CEO takes decisions in the interest of the shareholders. The Board must also ensure that the systems, practices and culture are in place to produce value for the shareholders. The NAB Board failed short of expectations. The NAB Board was presented with multiple warning signs from Risk Management, APRA and from NAB consultants.

As early as May 1999, the Internal Audit (IA) identified a series of issues related to the activity of the currency options desk and also some control issues. One of the major issues identified was the inability to reconcile front and back office profit and loss reports. Similar control issues surrounding the currency options desk were presented to PBAC in July 1999. This report was presented to PBAC before the Horizon system was implemented in July 2000. However, Internal Audit did not follow the successful resolution of the identified issues. The Board is partly responsible for not attempting to correct the identified issues.

The Internal Audit report from December 2001 presented the limit breaches as a significant issue, but no other explanation was provided. The subsequent January 2003 audit report assumed that the continuous limit breaches, which were approved by Mr. Dillon, were caused by the inappropriate design of the limits. The report also considered the VaR calculation inadequate. However, due to a new initiative by the Head of Internal Audit to change the classification criteria in rating the issues, the identified problems related to the activity of the currency options desk were reclassified. The issues were downgraded to a two-star rating, and were not presented to PBAC.

Despite their apparent inability to detect serious issues with the systems and policies in place, the auditors presented NAB some potential issues that needed to be addressed. In 2001 and 2002, KPMG, the NAB's external auditor, presented the Board with reports that rated the issues related to the activity of the foreign exchange options desk as minor. These issues identified by KPMG were related to the fact that no volatility smile was used and as a consequence, certain options might be mispriced. Similar issues identified were related to the fact that market risk was more focused on process and reporting rather than trying to understand portfolio risk and weaknesses of stress testing and scenario analysis.

Also the KPMG reports presented in front of PBAC in November 2003 did not report any of the issues related to the limit breaches nor the absence financial controls at the respective desk. Only in the letter for management attention in February 2004(draft December 2003), KPMG finally considered the limit breaches as a "systemic issue".

In May 2002, the Board also received a PwC report about the foreign currency losses at Allied Irish Bank, the NAB subsidiary. The conclusion of the report was that

governance model was responsible for the losses, by allowing a number of control breakdowns that prevented the early detection of the losses.

In order to address some potential issues at NAB, the General Manager Services in CIB prepared a memorandum. The memorandum presented a series of breakdowns and recommendations, however the identified issues were not considered important. A potential risk issue was the control environment, which should be stress tested and refined. The conclusion of the report was that a fraud of such proportions would be impossible at NAB, since the bank had adequate controls in place.

The Board also received additional warning signals from APRA. In January 2003, the Chairman of the Board received a letter from APRA, containing the results of the new PAIRS assessment. APRA's new system was supposed to identify the major areas of concern. APRA identified some control breakdowns, but did not find any issues of "significant concern". Some issues needed to be addressed promptly, such as "lax approach to limit management", "non-adherence to risk management policies"[11], no formal model validation, inadequate back- testing for the approved VaR model valuation and the fact that NAB portfolio was calculated using the front office information. Mr. Allen, the Chairman of the Board did not consider appropriate to reveal the content of the letter with the other Board members, but asked the Head of Global Risk Management, Chris Lewis, to prepare a response. The NAB response to the regulator suggested that issues were "minor and were being addressed"[12].

[11] PwC report pp. 41
[12] PwC report pp. 29

The content of the APRA letter and the response were circulated in PBAC in May 2003, as a consequence of a formal request from the Board Committee. However, PBAC did not ensure that the issues raised by APRA were addressed.

APRA performed another review in August 2003, and in early November submitted a letter to Mr. Lewis, who did not consider it necessary to send copies to the Board. APRA letter suggested that indeed NAB started to address the issues revealed in the January letter and made good progress. Such statements from APRA reveal that the regulator was effectively kept in the dark and that regulatory monitoring was not able to identify the real situation with respect to the quality of the risk management systems.

The Board failed to address the well-known weaknesses of the risk management framework. The Internal Audit reports and MR&PC revealed significant issues related to the activity of the FX Options Desk. Such issues were not promptly resolved. The Board also did not take action with respect to the longstanding conflict between MR&PC and CIB. The Board did not investigate nor enforced the credit limits and improper adherence to the risk management policies.

The policies promoted by the Board did not specify clearly the responsibilities of Risk Management and CIB. As a consequence of this situation, Mr. Erdos was able approve transactions that MR&PC did not approve of. Such failures appear increasingly important in the light of the fact that poor monitoring, supervision and financial controls allowed similar losses at AIB in 2002.The fact that MR&PC needed CIB’s approval and funds for upgrading its systems violates the established best practices of Risk Management independence from the monitored business.

6.5. APRA's failures

APRA is the Australian prudential regulator. As mentioned, APRA's goal is to protect the banks' depositors and the policyholders of insurance companies. APRA is responsible for enforcing capital requirements, setting and enforcing appropriate disclosure rules and performing regulatory monitoring. APRA's main failures are related to the enforcement of market discipline requirements and its inability to determine the risk management weaknesses through regulatory monitoring.

APRA did not adequately investigate NAB' risk management policies and risk taking despite warnings from the market. In March 2002, APRA was informed about a large position contracted by the FX Options Desk. The complain was particularly referring to the amount of risk NAB was exposed to. As a consequence, APRA contacted NAB and raised the issue of credit limits, but no investigation followed.

APRA's formal investigation was performed in August 2002. The result of the investigation was presented to the Chairman of the Board in early January 2003 (almost five months later). The APRA letter suggested that they did not identify any significant issues at NAB, but would like to see improvement with respect to limit management, adherence to risk policies and stress testing. Mr. Lewis' response downplayed the significance of the APRA findings, but suggested that the issues were being addressed.

The APRA performed another audit in August 2003 and presented NAB a report in November 2003. Despite the fact that NAB took no action to improve the issues previously identified by APRA, the report mentioned significant improvement. The content of the letter suggests that APRA was not able to follow the issues previously identified.

Subsequent information from NAB's yearly declaration, which did not contain the known risk management issues such as limit breaches, non-adherence to risk policies and the conflict between Risk Management and the FX Options Desk, subsequently increased APRA's perception that NAB was striving to address the issues. The declaration suggested that the risk issues were identified and that the information presented to the regulator was "accurate and current". A similar letter from the manager of MR&PC, Tzu Ming Lao, sent to APRA in December 2003, did not mention the nature of the limit breaches, but instead suggested that NAB improve their limit management policies.

After the losses were communicated to the public in early January 2004, the Federal Treasurer, Peter Costello, defended APRA's inaction by claiming that the role of the regulator is to ensure capital adequacy, and since NAB was properly capitalized, the foreign exchange losses were not APRA's business. However APRA did not adequately perform its regulatory monitoring role.

The APRA report was presented March 27, 2004. The report was similar to the PwC report, but also contains multiple requirements for NAB to address. Among them, the FX Options Desk is suspended until further notice (most likely mid-2005). Also the NAB is not allowed to use its internal risk management model. APRA also raised its capital adequacy ratio to 10% instead of 8%. As a consequence, an additional A$ 2 billion (out of approximately A$ 400 billion-total assets) in capital requirement will be kept aside for regulatory purpose. This regulatory requirement of not allowing NAB to use its internal model is a serious issue that gives a strong indication that NAB is not adequately

prepared to assess risks. APRA also requested NAB to improve its whistleblowing policies.

It is clear that APRA did not adequately perform its intended goal, however APRA's tough language used throughout the report was aimed at producing the impression that the regulator knows what it is doing and will severely prosecute other instances of inappropriate risk taking.

From a game theory perspective, the regulator faces numerous difficulties. According to the theory of regulation, informational asymmetries prevent the regulator from assessing the risks that a financial institution is exposed to. Research outlined in chapter 3 suggests that the regulator cannot force the banks to take risks according to the risk premia. The high costs that the regulator faces due to the deposit insurance policy reduces its ability to prevent a financial catastrophe. The regulator ability to take action when monitored institutions fail to respect regulatory guidelines is hampered by concerns for his/her career. As a consequence, the regulator should encourage the board and Risk Management monitoring and disclosure policies.

It is evident that APRA was not aware of the NAB's failures to comply with regulatory requirements. Regulatory monitoring failed to detect weaknesses in the risk management policies. APRA also noticed significant improvements despite NAB's failure to address the identified issues. APRA previously failed to enforce the regulatory standards in the highly publicized failure of HIH Insurance in 2001.

HIH was Australia's second largest insurer. Its intention to expand into other markets allowed HIH to contract a series of bad portfolios that accelerated the insurer's fall. From 2000, APRA was aware of HIH precarious position and possible insolvency,

due to a report from a former HIH executive. HIH's position continued to deteriorate until December 2000, when the insurer failed to file its account to APRA. Such situation would automatically generate a 14-day notice for starting an investigation. APRA failed to submit the 14-day notice to HIH until March 1, 2001. On March 13, 2001 HIH filed its bankruptcy file one day before APRA stepped in.

APRA was widely criticized for its inability to prevent the failure of HIH that forced the government to create A$500 million fund to cover some of the HIH policies. The HIH commission suggested that APRA did not have qualified staff and also needed to improve its monitoring function. According to the HIH senatorial report, APRA should improve its structure and operations and promote auditors independence. In the wake of the HIH disaster, APRA's chief executive Graeme Thompson admitted that the regulator failed short of expectation. Mr. Thompson had to leave APRA in 2003 after the after the results of the HIH inquiry was brought to the public. At the time Mr. Costello, the Public Treasurer, promised that the recommendations of HIH investigation will be promptly implemented. However, Mr. Costello's defense of APRA soon after the NAB FX loses were announced, suggests that the treasurer did not seriously consider improving the regulator's performance. APRA's performance in monitoring NAB also suggests that the recommendations of the HIH commission were not properly addressed.

6.6. PwC's failures

PwC's previous relations with NAB did not allow PwC to be an independent auditor. PwC' s dependence of NAB was in clear violation of the Sarbanes-Oxley Act. Also, Mr. Kraehe's interference with the PwC probe was in contradiction with the governance guidelines promoted by the Cadbury Committee, which requires the Board not to interfere in any external audit or inquiry. Mr. Stewart was not informed of the Board's interference with the probe since Ms. Walter criticized Mr. Kraehe's interference with PwC probe in early March 2004, weeks after Mr. Stewart declared that he was the only NAB official in contact with the PwC investigative team.

The PwC report reveals multiple weaknesses in addressing the nature of the losses at NAB. Firstly the report does not try to disentangle the activity of the Traders themselves. Also the close relationship between Mr. Dillon and the traders is not impartially presented and the whistleblower's identity is not revealed. When identifying weaknesses, the PwC did not present the responsible person or department in NAB, but criticized the "culture" at NAB. Also the PwC report did not present the CEO's failures in designing an inadequate Risk Management department. The report is also very mild with the former Chairman of the Board, Charles Allen, Mr. Lewis, and Mr. Erdos.

The report did not criticize PBRC's activity. The report also failed to mention PwC's inability to discover the "one-hour window" that allowed the traders to record false transactions in the Horizon system. The report also did not reveal the fact that Mr. Duffy and Dillon designed and implemented parts of the Horizon system and interfaces with the bank office systems.

6.7 Similar losses

6.7.1. Barings

NAB's foreign exchange losses reveled serious weaknesses of the risk management framework. However similar losses were produced at various other financial institutions. Barings bank collapsed in early 1995 due to the activity of one trader, Nick Leeson, who lost $ 1.4 billion by betting on the Japanese index Nikkei 225. Considered a superstar trader, Leeson had access to the back office systems, which allowed him to hide some of his losses using false transactions. Leeson's subsequent activity lead to the Barings Bank collapse. In both cases the traders were able to hide the true position of their portfolio and avoided closing their position after a loss.

6.7.2. Homeside

NAB wanted to expand its commercial mortgage operations, therefore acquiring a "mortgage-processing technology" such as Homeside appeared as a brilliant idea. NAB paid dearly for this endeavor, $ 1.7 billion (or $28 per share at the time the shares were traded at $21. The CEO of NAB at the time, Don Angus, received the advice to buy Homeside from the senior KPMG partner Chris Lewis. Chris Lewis suggested that Homeside accounts are free of misrepresentation. The problem with Homeside was also related to risk management. As a mortgage lender, Homeside was vulnerable to changes in interest rates. Chris Lewis was not able to notice that Homeside business had

significant problems in hedging its risk and was subject to over A$ 3 billion in mortgage servicing costs. The NAB shareholders were not informed about these issues.

During 2001 the Homeside losses amounted to A$ 3.7 billion due to an unprecedented decrease in US interest rates and an inadequate Risk Management department. NAB blamed this losses on data entry errors, modeling error, weakness of the hedge due to “extreme market conditions”. NAB did not honestly reveal the causes of its failures and losses to the public, despite heavy losses for the shareholders.

7. Conclusions

The NAB foreign exchange losses revealed significant weaknesses in the ability of the Board to properly monitor the activity of the management. The Board failed to address major weaknesses of the risk management and corporate control framework and ignored various signals from MR&PC and the regulator.

There are various ways to improve the ability of the board to improve their monitoring. The current paper suggests some effective ways to improve the quality of corporate governance. The number of the members of the board should be reduced to a maximum of eight, the board members and the CEO should hold significant equity positions. The Board should have an independent chairman. The board members should meet more often if necessary.

The losses at NAB also provided evidence of the fact that neglecting the risk management framework can have severe consequences. The CEO and the board should ensure that the Risk Management has adequate policies, methodologies and infrastructure. An adequate Risk Management department can allocate capital according more efficiently and can reduce the amount of regulatory capital. Applying the NAB lessons means that the probability and the severity of fraud or other operational risk is greatly reduced.

This paper also investigates the activity of the regulator. The government's decision to implement deposit insurance for the financial institutions' clients required additional regulation. Given the deposit insurance policy pursued by the government, the banks have incentives to take additional risks that are not communicated to the regulator.

Therefore, the regulator needs to take additional steps to insure the solvency of the monitored institutions such as capital requirements and regulatory monitoring.

In the NAB case, the regulator was not able to detect the weaknesses that allowed the losses to occur. In order to fulfill its tasks, the regulator could improve its monitoring of the financial institutions by hiring highly qualified specialists and by encouraging the monitoring activity performed by the board and the Risk Management. The regulator also needs more flexibility in compensating its employees, since as mentioned in the regulation section, career concerns increase the threshold that the monitored institutions have to pass in order for the regulator to step in. Nonetheless the activity of the regulator is also influenced by the political pressure from the government. In a small country it is therefore possible that the top layers of government and corporate powers to collude, therefore reducing the ability of the regulator to perform and enforce its prudential regulatory standards. Under these circumstances, the regulator cannot prevent financial disasters, but can only pick up the broken pieces.

An alternative way to reduce the failures and high social costs of financial regulation would be to reduce or eliminate the government-backed deposit insurance scheme and to promote public disclosure of capital levels and risk exposures. Such situation would therefore allow the customers of financial institutions to allocate their funds accordingly and the corporate powers to monitor the activity of the management with little government interference.

Hopefully, such experiences will provide a framework for improvement in the areas of corporate governance and regulation.

Bibliography

Akerlof, A.G., Romer, P.M., Hall R.E., Mankiw, N.G. (1993) "Looting: The Economic Underworld of Bankruptcy for Profit", *Brookings Papers on Economic Activity*, **52**(2), pp. 1-73.

APRA (2004) "Report into irregular currency options trading at the National Australia Bank" Australian Financial Review

Australian Broadcasting Corporation - www.abc.net.au

Baker, G. P., Jensen, M.. C., Murphy, K. J. (1998) "Compensation and Incentives: Practice vs. Theory", *Journal of Finance*, **63**(3), pp. 593-616

Bebchuk, L. A., Fried, J. M.,Walker, D. I. (2002) "Managerial Power and Rent Extraction in the Design of Executive Compensation", *University of Chicago Law Review*, **69**, pp.751-846

Becht, M., Bolton, P., Roell, A. (2002) "Corporate Governance and Control", *European Corporate Governance Institute - Finance Working Paper No. 02/2002*

Berle, A. (1931) "Corporate powers as powers in trust", *Harvard Law Review* **44**(7), pp. 1049–1074.

Bhattacharya, S., Gale D. (1987) "Preference Shocks, Liquidity and Central Bank Policy", in W. Barnett and K. Singleton, eds., *New Approaches to Monetary Economics*. New York: Cambridge University Press pp. 69-88

Black, F., Miller, M. H., Posner, R. A. (1978) "An Approach to the Regulation of Bank Holding Companies", *The Journal of Business*, **51**(3), pp. 379-412.

Black, Bernard S. (1990) "Shareholder Passivity Reexamined" *Michigan Law Review*, **89**, pp. 520-608.

Blake Dawson Waldron (2004) "Probity and Governance Advice Report into Foreign Exchange Losses".

Bordo, Michael D. (1986). "Financial Crises, Banking Crises, Stock Market Crushes and the Money Supply: Some International Evidence, 1870-1933", in Forrest Capie and Geoffrey E. Wood, eds., *Financial Crises and the World Bank*. London. MacMillan Press. pp. 190-248.

Calomiris, C. W. (1993) "Regulation, Industrial Structure, and Instability in U.S. Banking: An Historical Perspective," in Michael Klausner and Lawrence J. White,(eds.), Structural Change in Banking, Homewood, Ill: Business One Irwin, pp. 19-116.

Calomiris, C. W., Gorton,G. (1991) "The Origins of Banking Panics: Models, Facts, and Bank Regulation." in R. Glenn Hubbard (ed.), *Financial Markets and Financial Crises*.

Chan Y.-S., Greenbaum S. I., Thakor, A.V. (1992) "Is Fairly Priced Deposit Insurance Possible?" *The Journal of Finance*, **47**(1) , pp. 227-245.

Clifford, W., Crandall, R. W. (1994) “Explaining Regulatory Policy,” *Brookings Papers on Economic Activity: Microeconomics,* pp. 1-49.

Crikey.com

Crouhy, M., Galai, D., Mark R. (2001) “Risk Management” McGraw-Hill

cnn.com

Daily, C. M., Dalton, D. R. (1994) “Corporate Governance and the Bankrupt Firm: An Empirical Assessment, *Strategic Management Journal*, **15**(8), pp. 643-654.

Daily, C. M., Johnson, J. L., Ellstrand, A. E., Dalton, D. R. (1998) “Compensation Committee Composition as a Determinant of CEO Compensation”, *The Academy of Management Journal*, **41**(2), pp. 209-220.

Deloitte (2004) “Independent Review Report to the Board of Directors of National Australia Bank”

Donaldson, R. Glen (1992) "Sources of panics : Evidence from the weekly data," *Journal of Monetary Economics*, vol. **30**(2), pp. 277-305

Fama E. F. (1980) “Agency Problems and the Theory of the Firm”, *The Journal of Political Economy*, **88**(2.), pp. 288-307

Fama, E., 1985, "What's Different About Banks?," *Journal of Monetary Economics*, **23**,pp. 29-39
Financial Times

Fizel, J. L., Louie, K. K. T. (1990) “CEO Retention, Firm Performance and Corporate Governance”, *Managerial and Decision Economics*, **11**(3), pp. 167-176.

Fleming, T. (2001) “The New Dealer’s War,” Basic Books

Friedman, M., Schwartz A. J., “A Monetary History of the United States, 1867-1960”, Princeton: Princeton University Press 1963

Freixas, X., Rochet, J.C. (1997) “Microeconomics of Banking”, MIT Press

Furfine, C.H. (2003) “Interbank Exposures: Quantifying the Risk of Contagion”, *The Journal of Money, Credit and Banking*, **35**(1), pp. 111-128.

Gale, D. (2004) “Notes on Optimal Capital Regulation”- forthcoming

Gibbons, R., Murphy, K. J. (1992) “Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence”, *The Journal of Political Economy*, 100(3), pp. 468-505.

Gorton G. (1988) “Banking Panics and Business Cycles”, *Oxford Economic Papers*, **40**(4), pp. 751-781.

Gorton, G., Winton A. (2001) “Financial Intermediation”, in *Handbook of the Economics of Finance*, Elsevier North-Holland

Grossman, R. S. (1994) “The Shoe That Didn't Drop: Explaining Banking Stability During the Great Depression”, *The Journal of Economic History*, 54(3), pp. 654-682.

Hart, O. (1995) “Corporate Governance: Some Theory and Implications” *The Economic Journal*, **105**, pp. 678-689.

Hermalin, B. E., Weisbach, M. S. (1988) “The Determinants of Board Composition *The RAND Journal of Economics*, **19**(4), pp. 589-606.

Hull, J. C. (2003) Options, Futures, and Other Derivatives”, Prentice Hall

Jensen, M. C. and Meckling, W. H. (1976) “Theory of the firm, managerial behavior, agency costs, and ownership structure”, *Journal of Financial Economics* **3**(4), pp. 305–360.

Jensen, M. C. (1993) “The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems”, *The Journal of Finance*, 48(3), pp. 831-880.

Kane. E. J.(1990) “Principal-Agent Problems in S&L Salvage”, *The Journal of Finance*, **45**(3), pp. 755-764.

Kane. E. J.(2003) “ “ What Lessons Might Crisis Countries in Asia and Latin America Have Learned from the S&L Mess? ”, *The International Journal of Business and Economics*, **38**, pp. 21-30.

Kaplan, S.N. (1994) "Top Executive Rewards and Firm Performance: A Comparison of Japan and the U.S." *The Journal of Political Economy*, **102**, pp.510-546.

Kole, S., Lehn, K.(1997) “Deregulation, the Evolution of Corporate Governance Structure, and Survival”, *The American Economic Review*, **87**(2), pp. 421-425.

Mailath, G., Mester, L. (1994) “A Positive Analysis of Bank Closure”, Journal of Financial Intermediation, **3**, pp. 272-299

Marcus, A. J., Shaked, I. (1984) “The Valuation of FDIC Deposit Insurance Using Option-Pricing Estimates”, *Journal of Money, Credit and Banking*, **16**(4), pp. 446-460.

Mishkin, F. (1992) “The Economics of Money, Banking, and Financial Markets”, HarperCollins: New York 1992

PricewaterhouseCoopers (2004) “Investigation into foreign exchange losses at the National Australia Bank”

smh.com

Stigler G. J. (1971) “The Theory of Economic Regulation”, *The Bell Journal of Economics and Management Science*, **2**(1), pp. 3-21.

Shleifer, A. and Vishny, R. W. (1997) A survey of corporate governance, *Journal of Finance* **52**(2), pp. 737–783.

The Age

The Economist
Warther, V. 1998. "Board Effectiveness and Board Dissent: A Model of the Board's Relationship to Management and Shareholders." *Journal of Corporate Finance* **4**(1), pp. 53-70.

Watts, R. L., Zimmerman, J. L. (1978) “Towards a Positive Theory of the Determination of Accounting Standards”, *The Accounting Review*, 53(1), pp.112-134.

Weisbach, M.S. (1988). Outside directors and CEO turnover *Journal of Financial Economics*, **20**, pp. 431-460.

White, E. N. (1998) "The Legacy of Deposit Insurance: The Growth, Spread, and Cost of Insuring Financial Intermediaries", in *The Defining Moment: The Great Depression and the American Economy in the Twentieth Century*, Michael D. Bordo, Claudia Golden, and Eugene N. White eds., Chicago: The University of Chicago Press, 1998, pp.87-121.

Annex 1

Board membership at NAB before January 2004

Board of Directors (Non-executive)
· Charles Allen (Chairman until 16 February 2004)
· Brian Clark
· Peter Duncan
· Graham Kraehe (director from 1997, Chairman from 16 February 2004)
· Kenneth Moss
· Geoff Tomlinson
· John Thorn (director from 16 October 2003)
· Edward Tweedell
· Catherine Walter

Board of Directors (Executive)
· Frank Cicutto (director until 2 February 2004)
· John Stewart (director from 11 August 2003)

Annex 2

Glossary

AIB	Allied Irish Bank, NAB subsidiary
APRA	Australian Prudential Regulation Authority
CBA	Commonwealth Bank of Australia
CEO	Chief Executive Officer
CIB	Corporate and Institutional Banking
CIB RMEC	CIB Risk Management Executive Committee
CRMC	Central Risk Management Committee
GM	General Manager
GMD	Global Markets Division
GRF	Group Risk Forum
FX	Foreign exchange
JHFX	Joint Head of Foreign Exchange
LBO	Leveraged buyouts
MR&PC	Market Risk & Prudential Control
P&L	Profit and Loss
PB	Principal Board of NAB
PBAC	Principal Board Audit Committee
PBRC	Principal Board Risk Committee
PUA	Product Usage Authority
PwC	PricewaterhouseCoopers
RMD	Risk management document
RMEC	Management Executive Committee
USD	United States dollar
SEC	Securities and Exchange Commission
SRA	Strategic risk assessment
VaR	Value at Risk