



## Corporate Governance and Operational Risk: Empirical Evidence

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### ABSTRACT

The aim of this paper is to study the effect of governance mechanisms on the operational risk management of banks. A total of 1176 operational loss events recorded in 14 banks during the period 2006-2013 are analyzed to study the relation between the operational loss events and seven indicators of governance: the board size, the proportion of foreign administrators, the proportion of a government representative on the board, the proportion of institutional directors, the proportion of independent directors, the rotation of the director and the internal rating of the bank. The results show that only six governance mechanisms have significant effects on operational risk management. The size of the board of directors, the presence of independent directors, the presence of institutional directors, the presence of a state representative, the presence of foreign directors on the board of directors are positively and statistically significant with the severity operational losses. The results also state that the internal rating variable is negatively and statistically significant with the severity operational losses. But, the turnover hasn't any impact on the operational risk management.

**Keywords:** Operational Risk, Operational Loss Events, Corporate Governance, Basel III

**JEL Classifications:** G28, G34, G38

### 1. INTRODUCTION

Banks are the backbone of economic growth around the world. Unlike other financial institutions, the activity of banks is more risky. Therefore, the biggest challenge for banking is to manage their risks in a transparent, safety and in accordance with Basel standards (Lamarque [2011]). However, the banking sector has been marked, over the past decade, by many high profile operational loss events such as the bankruptcy of the Barings Bank in 1995, the financial losses of Allied Irish Bank in the early 2000s, the Societe Genrale in 2008, the subprime crisis, the loss of UBS Bank in 2011 and the case of VTB Bank in 2015. These operational failures, which have shaken the operation of the banking business, have proved the extent of operational risks compared to other banking risks. Operational risks are the risk of losses resulting from the failure of people, processes, internal systems and from external factors [BIS (2001c)]. In fact, these

operational losses have not only had a negative impact on the conduct of the banking business, but also destabilized the entire financial system since the banking sector is the beating body of the financial system.

From the eighties, financial liberalization was imposed because of the removal of barriers to entry into the financial markets. Banks became, then, more and more autonomous in the financing of investment projects whatever their types. This financial liberalization has, therefore, promoted competition among the various economic institutions. Therefore, all financial institutions are obliged to innovate and improve the quality of their services in order to restore the confidence of their customers and guarantee their long-term sustainability. However, this change in the functioning of the financial markets has caused a certain destabilization of the financial system and this following excessive risk taking by financial institutions, including banks. The

commitment of the latter in risky activities has been strengthened, too, by financial disintermediation in order to increase their profitability and reward their losses. Financial innovation, such as securitization of receivables, has also made banking activity increasingly risky. However, the last financial crisis has revealed flaws in this technique since it has made the evaluation of the yields and risks of subprime assets more and more complex.

In addition, the subprime crisis highlighted the need to ensure the appropriate practices of risk management in the banks. According to Lobe (2010), banking governance is a preventive element of banking risks. However, it is interesting to note that bank governance differs from that of companies because of the specificity of their activities. Banks have been characterized by high informational asymmetry [Caprio and Levine (2002), Levine (2004)], a high level of debt [Macey and O'Hara (2003)] and strong regulation [Prowse (1997)]. These specificities of the banking activity revealed the importance of the role played by the internal mechanisms of governance in the prevention of the risks incurred more precisely the operational risks. The latter is defined as the risk of losses related to the failure or inadequacy of processes, internal systems, people or external events [BIS (2001 b)]. Moreover, it is essential to point out that operational risk is clearly associated to the concept of governance which not only provides all the laws and rules to prevent failures of people, procedures and internal systems, but also the rules to conduct a financial institution [Fama, E., Jensen, M. C. (1983)]. Since then, the study of governance, as a mechanism for managing operational risk, came the attention of the risk managers, shareholders, academics, professionals, governments and international organizations.

Within this particular context, the objective of this paper is to investigate and address the relation between governance and the severity of operational risk events. However, theoretical and empirical contributions on the relationship between governance and operational risk management are quite rare and realized only on samples from developed countries such as: BIS (2010), Chernobai et al. (2011), Bello Ahmadu (2013), Wang and Hsu (2013), and Barakat and Hussainey (2013), Moosa and Li (2013b), Li and Moosa (2015). This scarcity of theoretical and empirical work is justified by the topicality of the concept of operational risks in developing countries, especially after the subprime crisis, the confidentiality of data and the complexity of modeling operational losses.

In this perspective, the contribution of this study is to contribute to enrich the financial literature on the study of the relationship between banking governance and operational risks. Indeed, we study the impact of governance mechanisms on the management of operational incidents recorded in banks from different geographical areas (United States, Australia, Canada and Germany). In other words, we try to answer the following questions:

What is the impact of the introduction of governance mechanisms on the management of operational losses of a banking firm?

To answer this question, we will first present an overview of previous theoretical studies on the relation between governance

and banking risks and more specifically operational risks. Subsequently, we will describe the methodology adopted while defining the hypotheses formulated and the variables used. We will analyze, in a last section, the empirical results obtained.

## 2. LITERATURE REVIEW

Banks represent the key of global economic growth since their bankruptcies causes not only a bad reputation for the institution, but also a destabilization of the financial system through contagion mechanisms. Due to their specific activities relative to those of companies, banks are exposed to a variety of risks such as: credit risk, liquidity risk, market risk and operational risk.

Indeed, the biggest challenge for these institutions lies in the effectiveness of their internal risk control processes to maintain trust of their stakeholders. However, the losses recorded during the last crisis highlight the existence of failures in the internal control systems of banks that have seriously affected the lives of thousands and even millions of people of whatever nature (employees, retirees, savers, creditors, or suppliers [OCDE (2007)]).

Therefore, the implementation of appropriate governance practices in banking institutions is a necessity for the prevention of bank failures and the consolidation of the banking sector. In the same vein, important advances in understanding the explanatory factors for failures recorded during this crisis have been addressed through various studies, such as: Andersen (2012), Mariem Haouat Asli (2013), Hess (2011), Cagan Penny (2008), Calomiris, C.W., Carlson, M. (2016), Cope and Carrivick (2013), Borio, C., Zhu, H. (2008), Bouasis K., Marsal Ch. (2009), Bektas, E., Kaymak, T. (2009), Bukhari, S.H., Awan, H., Faareha, A. (2013), Jongh et al (2013), RAJHI M. T., HMADI W. (2011 b), Rose Caspar (2009), Kolb Robert (2011), Mulbert Peter (2010), Williams Mark (2010). Zulkafli, A.H., Samad, F.A (2007).

The majority of these investigations confirmed that losses in crises are due to failures at risk management systems. Indeed, researchers have recently been focused on studying the effect of governance in the management of losses associated with operational risks. In this context, we cite the studies of: Allen and Jim Cebula (2008), Dickstein Dennis and Robert Flast (2009), BIS (2011), Wang and Hsu (2013), Chernobai and al (2011), Bello Ahmadu (2013), Barakat and Hussainey (2013), Moosa (2015).

BIS (2011) highlighted the importance of the board's role in improving the effectiveness of the business risk management process within financial institutions: "The board of directors should establish, approve and periodically review the framework. The board of directors should oversee senior management to ensure that the policies, processes and systems are effectively implemented at all decision levels." In other words, the board of directors exercises adequate supervision over the top management branch to reduce excessive risk taking and thus to improve the operational risk management system.

In this regard, Chenobai et al. (2011) conducted an empirical study to investigate the relationship between governance and operational

losses while using a sample of 925 operational events recorded in 176 American banks during the period 1980-2005. They used not only governance variables in their regression models (number of account commissioners on the board, compensation of the CEO, number of independent directors, size of board of directors, and number of meetings per year), but also factors reflecting the macroeconomic, financial and regulatory environment in which the bank operates. The estimation results show that the ultimate responsibility for managing bank risks is converged with the board of directors, which must monitor the risk taking of the management team. Indeed, the larger the size of the board of directors causes more coordination problems occur between directors, and therefore the likelihood of operational incidents occurring increases. The incentive of directors has positively impact on the operational losses. Besides, the presence of external auditors has negatively affects the probability of occurrence of operational losses. Similarly, the number of meetings per year and the number of independent directors have a negative and statistically significant impact on operational losses.

In the Nigerian context, Bello Ahmadu (2013), conducted an analysis of data from 13 listed banks during the period 2005-2009. He explained the severity of the operational losses by the leverage, the size of the board, the quality of the audit, the interest of the directors, the block holdings, the crisis, and the capitalization. The results state that the variable board composition, the audit quality and the capitalization variables are negatively and significant with banks' exposure to operational risks. However, the severity of the operational losses of the Nigerian banks is not influenced by the leverage, the proportion of the block holding and the interest of the CEO.

Based on 298 operational incidents recorded in financial institutions of different activities during the period 1996-2010, Wang and Hsu (2013) showed that the optimal size to have an effective governance system for operational risk management is to have 14 members in the board members. Empirical analysis has shown that the presence of external and internal administrators in the board can provide multiple perspectives and access to information and consequently, better resolution issues of divergence of interest between the different stakeholders of the institution. They revealed that the board size is negatively associated with the operational risk. However, the independent directors don't affect the operational risk. Regarding the age of the directors in the board, the empirical results showed a positive relation with the operational losses. Thus, the tenure of the directors is not significantly associated with the operational risk.

Barakat and Hussainey (2013) examined the impact of governance mechanisms on the quality of disclosure of operational losses of European banks. Using data from 85 banks recorded during the period 2008-2010, the empirical analysis reveals that the quality of disclosure of operational losses is negatively influenced by the degree of independence of directors. Similarly, they showed that there is a negative and significant relationship between the proportion of capital held by institutional investors and the frequency of operational incidents. The results reveal the importance of the role played by institutional investors in the

control of the risk-managers in the European context. However, the empirical results suggest that the presence of the audit committee on the board has a significant impact on the disclosure of operational losses. In other words, Barakat and Hussainey (2013) have shown that the more active the audit committee is, the lower the probability of operational losses and therefore the disclosure of operational incidents is important. In accordance with the work of Garcia-Marco and Robles-Fernandez (2008), Laeven and Levine (2009), the study of Barakat and Hussainey (2013) asserted that the most concentrated banks are the most sensitive to banking risks. This finding is different from the results found by Belkhir (2009a), Allen and Cebula (2008), Dickstein and Robert (2009) and Shehzad et al (2010) who state that ownership concentration negatively impacts bank risk taking.

In another context, Moosa and Li (2013b) highlighted the importance of the difference in the severity of the operational losses through cross-country analysis. By studying 4388 operational incidents recorded in 11 countries, Moosa and Li (2013b) have shown that internal fraud incidents depend on governance, the level of corruption, the quality of internal control, the quality of internal control, the level of disclosure of information and the style of management of banks.

Regarding to internal process losses, empirical results reveals that they are significantly influenced by regulations and legal systems. Thus, Moosa and Li (2013b) state that the technology used by banks has a significant impact on the explanation of internal system failures. In addition, external losses (such as natural disasters, acts of terrorism,...) are significantly affected by the economic fluctuations, regulation and the degree of compliance with environmental standards of the country in question.

In the same context, Li and Moosa (2015) conducted another study to highlight the importance of firm-specific factors through cross-country analysis in explaining operational losses. This difference between the countries may be due to differences in individual failures, processes, internal systems, and external events from one country to another as revealed by Moosa and Li (2013b). They studied the relationship between the occurrence of 4388 operational incidents recorded in 53 countries during the period 1975-2008 and six governance indicators. The empirical results reveal a negative and statistically significant relationship between the severity of operational losses and governance indicators. Concerning the regulatory quality variable, the estimation results have shown that the regulation, including the environmental regulation, has a very important explanatory power compared to other variables.

This finding seems logical since the regulation variable concerns the regulation of the general economy, including the environmental regulation, and not the implementation of the Basel standards for control of operational incidents. In other words, the more regulation is imposed, the lower of the operational failures in the countries.

Through this first section, we have tried to present a brief overview of previous work on the impact of governance on operational

risk management. In addition to the scarcity of works, we note that the financial literature does not result in a consensus on the contribution of governance mechanisms in the management of operational losses and therefore this impact remains mixed. Similarly, the debate on the link between the severity of operational losses and banking governance is not yet closed since it is a topical issue for risk managers, regulators and academics. It is in this context, that we must offer a new perspective, through an empirical study, by testing the impact of some governance mechanisms on the severity of the operational losses of banks.

The novelty of this paper is to found in the introduction of other governance indicators that are not yet covered by previous work. We will explain the amount of operational losses through seven indicators: the proportion of foreign directors, the proportion of a government representative on the board, the proportion of institutional directors, the size of the board of directors, the proportion of independent directors, the turnover and the internal rating of the bank.

### 3. METHODOLOGY

#### 3.1. Hypothesis

Referring to the work of Chernobai and al (2011), Bello Ahmadu (2013), Barakat and Hussainey (2013) and Wang and Hsu (2013), we make the following assumptions:

- $H_1$ : The size of the board positively impacts the loss experience of operational losses
- $H_2$ : The proportion of foreign directors influences the severity of banks' operational losses
- $H_3$ : The proportion of institutional directors influences the loss ratio of operational risks
- $H_4$ : The proportion of state administrators has a significant impact on the severity of operational incidents
- $H_5$ : The presence of independent directors on the board has a negative impact on the severity of operational losses
- $H_6$ : Turnover has an effect on the management of operational losses: The threat of being replaced can be an indirect mechanism of control and discipline of the manager
- $H_7$ : The internal rating of a bank has an impact on the management of operational losses
- $H_8$ : The level of capital has a negative impact on operational incidents.

#### 3.2. Presentation of the Sample

In this research, we solicited relevant data from multiple databases for our empirical study. We collected operational risk events from the operational Riskdata eXchange association database. Concerning the governance indicators, the data was collected from Thomson Financial One Banker Ownership and the banks' annual reports. Therefore, the sample of our research is composed by 1176 operational incidents recorded in 14 banks over a period of 8 years from 2006 to 2013, which was a panel of 112 observations. The banks of our sample are defined in Appendix 1.

The choice of these banks is justified, in the first place, by their rankings according to the performance and the degree of disclosure of operational losses to the OReX. In the second place, these

institutions were selected according to the TOP 1000 WORDS BANKS ranking in year 2014.

#### 3.3. Econometric Model

The aim of this paper is to analyze the effect of governance mechanisms on the severity of operational losses. To do this, we relied on panel data for our empirical study. The choice of the adoption of the panel data in this research is justified by the double individual and temporal dimension of bank losses. Unlike time series and cross-section, the double dimension of panel data takes into account both the dynamism of individual behaviour and its heterogeneity. Similarly, this dual individual and temporal dimension of the data leads to increase the number of observations and the degree of freedom (Pirotte Alain [2011]).

In order to analyze the relationship between governance and the severity of operational losses disaster, we will use a linear regression based on panel data recorded in 14 banks from different geographical areas during the period 2006-2013.

The equation (1) expresses the basic model of our analyses.

$$Lnol_{it} = \beta_0 + \beta_1 F_{it} + \beta_2 INST_{it} + \beta_3 GOV_{it} + \beta_4 TCA_{it} + \beta_5 Turnover_{it} + \beta_6 INDEP_{it} + \beta_7 CAP_{it} + \beta_8 Rating_{it} + \varepsilon_{it} \quad (1)$$

The variables in equation (1) are defined in Table 1.

**Table 1: Variable definitions**

Variables	Definition
Lnol	Logarithm of the severity operational loss
TCA	Size of the board of directors equal to the number of directors on the bank's board of directors
F	The ratio of the number of the foreign directors on the board to the total number of directors on the board
INST	The percentage of the institutional directors on the board
INDEP	A dummy variable that takes the value 1 if the proportion of independent directors exceeds 20% in bank i at time t, 0 otherwise
GOV	The percentage of the state institutions on the board .It is measured by the ratio of the number of directors representing the state to the total number of directors
Turnover	A dummy variable equal one if the director of the bank was replaced in the past, 0 otherwise
Rating	A dummy variable that equal one if the notation exceeds A +, 0 otherwise
CAP	The level of capital which corresponding to the ratio of equity to total assets

**Table 2: Descriptive statistics results**

Variables	Mean	Standard deviation	Min	Max
OI	18,562	16,253	0,296	65,715
F	0,245	0,140	0	0,473
INST	0,235	0,134	0	0,537
Gov	0,151	0,088	0	0,461
TCA	12,875	3,435	6	20
Turnover	0,116	0,3217	0	1
INDEP	0,446	0,499	0	1
CAP	0,363	0,211	0,076	0,923
Rating	0,696	0,461	0	1

## 4. EMPIRICAL RESULTS

### 4.1. Descriptive Analysis

The descriptive statistics of the variables mentioned earlier are presented in the Table 2.

Table 2 shows that the average loss severity of the 14 banks is 18.562 million dollars with a dispersion of 16.253 million dollars.

The exploratory analysis reveals that each bank has, on average 13 directors on the board with a maximum of 20 and a minimum of 6 members. This result corroborates result the result of Pathan Shams (2009), and Pathan, S., Skully, M., (2010) who concluded that the average size of the board is 13. This result proves that the size of the board of directors in banks is larger than non-financial firms (Booth et al. [2002]). For board characteristics, we also note that the percentage of independent directors on the board is about 44%. This value is low compared to that found by Mishra, C.S., Nielsen, J.F. (2000). The proportion of institutional directors on the board of the 14 banks is on average 23.6%. Similarly, we note that the proportion of foreign directors on the banks' boards of directors in our study is almost equal to that of institutional directors. Also, we observe that the average of the proportion of directors representing the state is equal to 15.16%.

Regarding the internal rating, we reveal that more than half of the banks of our study have a rating above A+ or even a percentage of 69.64%. However, we note that on average 11.6% of these banks changed their CEO during the period 2006-2013.

Concerning the CAP variable, the results shows that the average capital of the banks is estimated at 36.37%.

### 4.2. Correlation Exams

Before starting the analysis of the estimation results, it is essential to analyze the multicollinearity between the independent variables of our model since the presence of correlation between the explanatory variables can bias the significance of the estimated parameters (Bourbonnais [2009]).

The Table 3 lists the correlation matrix of the variables in our regression model.

The analysis of the correlation matrix reveals the absence of a multicollinearity problem between the explanatory variables since their coefficients are <80% (Kennedy Peter [2003]). This finding

was thus validated by the VIF test since it has an average of 1.64 (<2) and the VIFS value <10 (Perret et al. [2012]).

In this case, we will introduce all the explanatory variables in our regression model.

### 4.3. Estimation Results

In order to overcome the problems of heterodasticity and autocorrelation of errors, we were interested in using the generalized least squares method (rated MCG) and more precisely the generalized least square feasible (FGLS). This makes automatic correction the problem of auto-correlation of errors while providing more robust results (Fitrianto et al. [2016]).

The following Table 4 lists the main estimation results.

The value of  $R^2 = 45.5\%$  which leads us to conclude that our model has a good quality of linear adjustment that is significant.

The results show that the size of the board has a positive impact on the severity of operational losses. As the number of directors sitting on the board increases, the quality of the DMR deteriorates and, as a result, the severity of operational losses becomes increasingly high.

Although the large number of directors brings a diversity of experience and knowledge, it is an explanatory element to the agency problems in the banks. In other words, the higher number of directors, the more problems of coordination and cohesion between members occur.

This seems logical since the board of directors represent a defensive means of shareholders' interests compared to other stakeholders, which leads to a deterioration of the quality of internal control systems and management of incidents related to personnel failures, internal processes and systems.

In addition, we note the existence of a negative and significant relationship at the 1% threshold between the presence of independent directors on the board and the severity of operational losses. As a result, our hypothesis  $H_5$  is confirmed. Indeed, the higher the proportion of independent directors, the lower the occurrence of operational incidents. This leads us to conclude that directors' independence is a mechanism for managing operational losses since they can exert a counter-power within the board of directors and counter a very effective operational

**Table 3: Correlation matrix**

	Lnol	F	INST	GOV	TCA	Turnover	INDEP	CAP	Rating
Lnol	1								
F	-0,445	1							
INST	0,101	-0,259	1						
GOV	0,315	-0,453	0,791	1					
TCA	0,466	-0,331	0,123	0,148	1				
Turnover	-0,041	0,011	-0,081	0,008	-0,100	1			
INDEP	-0,483	0,421	-0,021	-0,296	-0,277	-0,101	1		
CAP	0,124	0,207	-0,113	0,126	0,176	-0,076	0,114	1	
Rating	0,369	-0,271	0,142	0,295	0,214	-0,063	-0,149	0,109	1

**Table 4: Estimation results of the equation (1)**

Variables	Coefficients
Constant	1,140 (3,25)***
F	-2,249 (-4,41)***
INST	0,980 (1,68)*
GOV	-2,742 (-2,55)**
TCA	0,055 (2,31)**
Turnover	0,058 (0,27)
INDEP	-0,787 (-5,00)***
CAP	1,797 (4,30)***
Rating	1,083 (5,39)***
Number of observations=112	
Wald Chi-square 2(8)=163,92	
Prob. >Chi-square 2=0,0000	
R <sup>2</sup> = 45,5%	

\*\*\*Significant at the threshold of 1%, \*\*Significant at the threshold of 5%, \*Significant at the threshold of 10%

risk policy. This finding corroborates the work of Barakat and Hussainey (2013).

As for the proportion of institutional directors on the board, the estimation results reveal a positive and statistically significant relationship at the 10% threshold. Because of their large shares in the capital, they impose very risky strategies to increase their profits whatever the situation of the institution. As a result, this excessive risk-taking strategy leads to an increase in the occurrence of operational incidents and therefore deterioration in the quality of the internal control process of bank risks.

For foreign directors, our estimation results suggest that the higher the number of foreign directors, the lower the operational losses. In other words, the presence of a foreign director on the board of a local bank is an effective way of managing bank risks because of new knowledge, technologies and expertise. Indeed, the presence of representatives of foreign banks of developed countries in the capital of domestic banks facilitates access to new information-processing technologies and, to improve of prudential ratios for the calculation of the capital needed to absorb banking risks, specifically operational risks. Thus, the presence of a foreign director on the board of a local bank leads to an improvement in the quality of operational risk management due to new risk management policies and procedures.

This teaches us that the presence of foreign representatives on the board of local banks improves the quality of bank risk management and the performance of the banks of our study. In other words, the entry of foreign directors on the board leads to a better rating of the image of the bank. This result is consistent with those of Oxelheim and Randoy (2003) who approve of a strong relationship between banking performance and the proportion of foreign directors on the board. It allows us to accept the hypothesis H<sub>2</sub>.

In the same vein, we note that the proportion of a state representative on the board of directors is an effective means of controlling operational incidents. The higher the proportion of state representatives, the lower the operational risk during the period of our study. According to Boussaada R., Labaronne D. (2015), the state representative is a catalyst designed to ensure the flow of information between the bank's managers and the supervisory

authorities. This leads to an improvement in the quality of the operational risk management system. This induces us to validate our hypothesis H<sub>4</sub>.

In line with our expectations, our empirical investigation suggests the existence of a negative and significant relationship at the 1% threshold between a bank's internal rating and the severity of operational losses. The better the rating of the bank, the lower the losses associated with operational risks and therefore the better the quality of operational incident management. Therefore, the rating is an effective mechanism in the prevention of operational losses. Indeed, it strengthens the reputation of the banking firm since it informs the public about the financial situation and the overall solvency of well-rated banks. As a result, the most rated banks are obliged to establish an effective risk management system to guarantee and to reinforce their notoriety.

However, our empirical results reveal that the turnover has no impact on the bank's operational losses. The absence of a significant relationship between the replacement of the CEO and the severity of operational incidents can be explained by the fact that these replacements are not necessarily disciplinary in nature such as retirement, death, resignation.

For the CAP control variable, the estimation results reveal a positive and significant relationship between the bank capitalization and the operational risk. Indeed, banks that have an important capitalization ratio are the most exposed to banking risks and more specifically operational risks. This result corroborates the results found by Camara Boubacar (2006) which states a strong relationship between bank capitalization and risk taking.

## 5. CONCLUSION

This paper examines the impact of governance on the prevention of operational losses. Financial literature has highlighted the importance of an effective governance system in the prevention of banking risks (Lobez [2010]). Unlike credit and market risks, theoretical and empirical studies on the effect of banking governance on operational risk management are fairly recent and limited. In this context, we quote the work of: Anderson and al (2012), Bello Ahmadu (2013), Chernobai and al (2011), Hess (2011), Barakat and Hussainey (2013), Jongh and al (2013), Kolb Robert (2009), Moosa and Li. (2015), Wang and al (2013), Williams Mark (2010). The reflection on the relationship between banking governance and operational risk has become the main concern of the regulatory authorities especially during the last US crisis, which proved a crisis of failures of banking activity and not a classic crisis of insolvency risk. Through the review of the banking literature, we find that the theoretical and empirical debate on the effect of internal mechanisms on the management of operational incidents does not lead to a consensus and therefore the analysis of this effect is always mixed since the results of empirical studies are controversial. Therefore, this debate is not yet closed since it is a topical issue for risks-managers, regulators and academics due to the persistence of operational failures in both the banking sector and the financial system.

In this paper, we try to enrich this debate through an empirical study on a sample of 1176 operational incidents recorded in 14 banks from different geographical areas (Australia, Germany, Canada, and United States) during the period 2006-2013. The novelty of this research paper compared to others lies in the integration of governance indicators that are not yet addressed by previous work. In fact, we explained the amount of operational losses through seven governance indicators, namely: the proportion of foreign directors, the presence of a state representative, the proportion of institutional directors, the size of the board of directors, the proportion of independent directors, the Turnover of the CEO and the internal rating of the bank.

The results reveal a positive and significant relationship between the size of the board of directors and the amount of operational losses. Besides, we have confirmed that the independence of directors in the board plays a crucial role in preventing bank risks. They effectively control the decisions of the leaders. In contrast, the presence of institutional directors on the board exacerbates agency problems. These “short-term” investors can form alliances with leaders to adopt strategies that conform to their visions. They often vote in favor of the management team in order to maximize their profits to the detriment of other members and regardless of the risks incurred. Thus, the estimation results show that the presence of a state administrator on the board of directors is a catalyst for the flow of information flows between regulatory authorities and managers.

In addition, the presence of foreign administrators on the board is a preventive means of operational incidents. The internal rating is also an effective mechanism for managing bank risks. In other words, banks with rated assets are the least exposed to operational risks. In regards to the Turnover variable, our empirical study states that the degree of replacement of the CEO has no relation with the severity of the operational losses.

In conclusion, our empirical study highlights the importance of establishing an effective governance system for the prevention of bank risks, specifically operational risks. However, bank crises and defaults continue to persist despite the operational risk management control put in place by banks and the pressure from regulatory authorities. Since then, it is essential not only to consider good governance practices into account, but also to look at the calculation of capital requirements issued by the Basel II and Basel III frameworks. In other words, banks must not only establish an effective governance system, but also allocate the capital needed to deal with these kinds of unexpected losses.

The answer to this problem will be the subject of future research papers.

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**APPENDIX****Appendix I: List of banks in our sample**

<b>Banks</b>	<b>Country</b>
JP Morgan Chase & Co	USA
BancWest Corporation	USA
SunTrust Banks	USA
Wells Fargo & Co.	USA
Deutsche Bank AG	Germany
HypoVereinsbank	Germany
Bayerische Landesbank	Germany
DZ Bank Deutsche Zentral	Germany
Royal Bank of Canada	Canada
Bank of Montreal	Canada
Toronto-Dominion Bank	Canada
Canadian Imperial Bank of Commerce	Canada
Erste Group	Australia
Westpac Banking Corporation	Australia