

# **DO BANKS USE DERIVATIVES TO OFF SET ECONOMIC CONSEQUENCES OF WRONG STRATEGIES: EXTERNALLY GROWTH THROUGH ACQUISITIONS TOO MUCH EXPENSIVE (HOSTILE TAKEOVERS)?**

*Loredana Ferri Di Fabrizio\**

## **Abstract**

One of the unresolved questions in the matter of financial decision is why firms hedge with derivatives. Prior researches hypothesize different reasons for derivatives use and empirical results are contradictory. When Managers and Owners are different an agency problem could arise in the hedging decisions. For instance, the Managers may hedge in a manner that does not maximize the value of the firm. On one side derivatives allow shifting and hedging risks but on the other side reduce the cost of engaging in speculative transactions.

The paper is motivated mainly by the ongoing debate on derivatives use and seeks to answer following questions : how do corporate strategies use derivatives? What is the really goal of using derivatives: hedging or taking risks? How CEOs use derivatives to hide or delay losses or their imbalanced corporate strategies (e.g. hostile takeovers)?.

**Keywords:** ICTs, Employment Generation, Millennium Park

*\* Derivatives, Acquisitions, Hedging, Speculative, Risk Management, Systemic Risk, OTC, Financial Crisis, Shadow Banking*

## **1 Introduction**

The nature of bank's operations implies several financial risks (e.g. interest rate risk, foreign exchange risk, credit risk, liquidity risk) and requires on-balance and off-balance sheet strategies to manage them. During the past ten years, bank managers used derivatives contracts with position as dealers or speculators to manage these risks exposure (M. Venkatachalam, 1996).

Through financial derivative securities firms not only achieve goals to transfer and to hedge risks, but also have cheaply access to take speculative risks and determining when they are hedging or speculating is not a simple matter because it is difficult to value portfolio of derivatives. In banking sector is most important to determine if banks are using derivatives to hedge or to take risks because if large banks increase their risks through derivatives, the entire banking system is exposed to important potential losses related to. Otherwise, if large banks all take relevant positions in derivatives market, the failure of one may determine the failure of many, so called "Systemic Risk" (Gary Gorton and Richard Rosen, 1995). On one hand, derivatives allow shifting and hedging risks but on the other hand reduce the cost of engaging in speculative transactions. Their role in the recent crisis is not clear. Likewise, establishing the risk management benefit of financial derivatives is empirically difficult (Francisco Pérez-González and Hayong Yun, 2010).

Since the 1980s, the financial derivatives markets have been increased by firms that try to shed undesired risk and to hedge their exposures at low cost. In other words, derivative contracts allow to trade away risks that firms do not wish to be exposed while maintaining and controlling other risks exposures. For instance, an interest rate swap can be used to put off the interest rate risk from the credit risk (J.Kambhu, F. Keane and Catherine Benadon, 1996).

Derivatives are classified in two categories: Plain Vanilla and Exotic. Plain Vanilla includes: options (contracts based on a promise to buy or sell at a fixed price something in the future); forward contracts (one party is obliged to buy the underlying at a fixed price at a certain time in the future from a counterparty who is obliged to sell the same underlying at that fixed price); swap (is a contract to exchange cash flows over the life of the contract). Exotic derivatives are a complicated function of one or many underlyings (Rene M. Stulz, 2004).

The value of derivatives financial contract is related to the price of a particular financial security (bond or equity), to the likelihood of default on a payment or to the price of another derivatives-contract, e.g. options on a futures-contracts ( T. Norfield, 2012). Derivatives contracts have grown strongly in both organized exchanges and over-the-counter (OTC) markets: the most successful exchange-traded derivatives are those that add liquidity to the underlying markets, while the most successful OTC derivatives are those that paint

contracts adapted to the needs of counterparties in strip out risks. In the OTC markets are negotiated swaps, options and forward contracts without the interposition of a clearinghouse into deals. In particular, OTC markets trade personalized contracts and are less liquid than the underlying cash markets because their primary function is to offer new configurations of risks rather than provide liquidity (Eli M. Remolona, 1993).

Corporate risk management is one of the most important part of the firm's strategy and financial derivatives (currency, interest rate and commodity derivatives) are one means of managing risks facing corporation (Wayne Guay and S.P. Kothari, 2003).

Theoretical research investigates on optimal hedging in response to different types of capital market imperfections, which create incentives for firms to use derivatives instruments (C. Géczy, Bernadette A. Minton and C. Schrand, 1997). If capital markets are perfect, hedging with derivatives does not add to firms value and market imperfections explain why firms use derivatives each year. In particular, firms hedge in response to high costs of underinvestments and financial distress. In other words, hedging increase with expected financial distress costs, firm size and investment opportunities (John R. Graham and Daniel A. Rogers, 1999). Hedging increases firm value by reducing expected tax liabilities, costs of financial distress and to control agency problems. Corporate hedging consists in the use of off-balance sheet instruments (forwards, futures, swaps and options) that reduce the volatility of firm value (Deana R. Nance, Clifford W. Smith Jr, Charles W. Smithson, 1993). Hedging may also reduce suboptimal risk allocation resulting from an agency problem between managers and shareholders, thereby reducing agency cost (DeMarzo and Duffie, 1992).

The increasing role of derivatives as a tool for risk management determine the growth of derivatives market. Because the importance of the recognition and measurement of these financial instruments, the Financial Accounting Standards Board (FASB) established SFAS 105, SFAS 107 and SFAS 114 to improve the transparency of financial reports. SFAS 105 requires the disclosure of the contractual and notional amount, nature, terms and credit risk of financial instruments with "off-balance sheet" risk. SFAS 107 imposes at the banks to disclose the fair value of all financial instruments for which is possible to estimate the value. SFAS 119 requires banks to identify the purpose of the use of derivatives financial instruments, reporting whether the aggregate fair value of the derivatives portfolios represents a net asset or net liability position through a detailed information for fair values and contractual amounts of derivatives divided in category of instrument and the purpose for which they are held (M. Venkatachalam, 1996).

Banks and financial institutions developed their derivatives activities and contracts in derivatives instruments became more and more complex and

characterized by a longer maturities and cover a broader range of underlying assets. The most diffused within derivatives instruments is plain vanilla instruments (e.g. forwards). Derivatives risks are classified in several categories: a) Market risk related to the change in financial market prices, who may be determine losses related to the firm's financial position in derivatives; b) Credit risk related to the likelihood that the counterparty of a derivatives contract fails; c) Operational risk refers to losses generated by a weak internal controls or information systems; d) Legal risk that derivatives contracts are not legally enforced. To managing these different risks, firms develop methods of risk assessment (e.g. VAR). If derivatives business are based on theoretical models for pricing models, model errors add risk related to misvalued contracts sold for less than their actually worth or contracts purchased at overvalued prices. Mistakes in estimating risk exposures imply hedging strategies less effective than estimated (T. Clifton Green and Stephen Figlewski, 1999).

The corporate scandals occurred over the past ten years showed that more often managerial strategies are decided externally of the firm: another entity, different from the board (e.g. political power), chooses the goal of the firm without regards to the interest of shareholders. For instance, hubris CEOs of a local bank try to become a large bank, through an externally growth (e.g. hostile takeovers), aiming at self-entrenchment rather than enrich shareholders and to obtain the support of shareholders, they hide the losses of their bad deals (e.g. too high bid price), through an accounting manipulation.

This study conducts an empirical analysis within 134 commercial Banks in USA which incurred in failures in 2009 and the main finding of the model is that when banks lead by ambitious CEOs who adopt imbalanced corporate strategies conducting to the default, hire more than their real need, increase their investments in PP&E, their loans growth faster with the purpose of to portraying the bank to market as healthy firm. If the investors believe in these strategies, the market value increase as awards to the good job of the management but around the announcement of failure the market value drops significantly.

The paper is motivated mainly by the ongoing debate on derivatives use and seeks to answer following questions: how do corporate strategies use derivatives? What is the really goal of using derivatives: hedging or taking risks? How CEOs use derivatives to hide or delay losses or their imbalanced corporate strategies (e.g. hostile takeovers)?

The remainder of the article is organized as follows. Section 2 summarizes the existing literature on derivatives use. Section 3 introduces a conceptual framework developed through several propositions. Section 4 describes sample characteristics and presents the model. Section 5 concludes.

## **2 Literature Background**

In the literature on Derivatives usage, two main research stream can be identified: the first considers derivatives as useful tools that allow investment managers to utilize information better, manage risk and reduce transaction cost; the second, describes derivatives as speculative and high-risk investments (Jennifer Lynch Koski and Jeffrey Pontiff, 1999). For instance, Norvald Instefjord (2000) shows that bank risk is unrelated to access to derivatives markets and defines the bank as an institution with a relatively rigid capital structure and a relatively large asset exposure in illiquid loans markets. Banks that are able to hedge more, also take on more underlying risk. Starting to the beliefs that firm risk in banking sector has a systemic dimension and the credit derivatives market can help to limit the firm risk, Norvald Instefjord detects that credit derivatives instruments increase bank risk if the loans market is highly price elastic. On the opposite, Ludger Hentschel and S.P. Kothari (2001) find that no firms alter their exposure or volatilities through derivatives and an over widespread speculation with derivatives is unfounded. The Authors detect that firms use derivatives to reduce the risks associated with short-term contracts. More interesting, Tufano (1996) finds that firms in the gold-mining industry use derivatives to reduce risk, due to managerial and owner risks aversion. Yet, an empirical analysis within US firms operating in the sectors of electric and gas utilities (both high weather-sensitive), shows that weather derivatives allow an increase of firm value and hedging that, in turn, allow firms to increase investment and use more aggressive financing structures (Francisco Pérez-González and Hayong Yun, 2010). The study of a sample of large U.S. nonfinancial firms evidences a positively relationship between the use of foreign currency derivatives (FCDs) and firm market value. In other words, in according with prior researches (Stulz, 1984; Smith and Stulz, 1985; DeMarzo and Duffie, 1992; Froot, Scharfstein and Stein, 1993), firms attempt to reduce risks through models of corporate hedging based on derivatives. Alternative theories predict that firms use derivatives to take additional risks (Black and Scholes, 1973; Jensen and Meckling, 1976; Myers 1977).

Existing hedging theories try to explain corporate use of derivatives. In particular, prior empirical derivatives researches find a positive relationship between hedging and leverage, while other do not find they are related. Yet, some studies find a positive relation between derivatives use and both the market-to-book ratio and R&D expenditure while other do not detect such relation. Many firms hold derivatives positions because benefit in cash flow and market value sensitivities. The use of derivatives increases with greater investment opportunities, increases among more geographically different firms and among

firms lead by CEOs with high wealth sensitivity to stock price (Wayne

Guay, S.P. Kothari, 2003). When firms recognize that external financing is expensive and it implicates a reduction in investment opportunities, firms conduct their hedging through the use of derivatives. In the meantime, when firms do not generate enough cash flow, hedging can increase firms value reducing the underinvestment problem associated with high cost of external financing (Gerald D. Gay and Jouahn Nam, 1998).

Without hedging, firms are more likely to pursue suboptimal investment projects, while hedging reduces the costs of obtaining external funds and the dependence on external financing (Myers, 1977).

M. Venkatachalam (1996) investigates on the risk management strategies of banks and studies the relation between fair value gains and losses on derivatives and on-balance sheet gains and losses on financial instruments. The author finds that the fair value gains and losses on-balance sheet financial instruments are negatively related with the fair value gains and losses on derivative hedge instruments. This result suggests that banks use partially derivatives to reduce their risks exposure and a significant number of sample banks might use derivatives to assume additional risks rather than to reduce risk. M. Venkatachalam also shows that notional values of derivatives is negatively related to bank equity value after controlling for the fair values of derivatives. In other words, the fair value estimates for derivatives is correlated with the variation in bank share prices.

Firms with potential exposure to foreign currency risk generated from foreign operations, foreign-denominated debt and high concentration of foreign competitors in their industries use currency swaps, forwards, futures, options or combinations of these instruments. In particular, firms with greater growth opportunities and in presence of financial constraints are more likely to use currency derivatives to reduce the variation in cash flows or earnings that might preclude investments in growth opportunities (C. Géczy, Bernadette A. Minton and C. Schrand, 1997).

Managers decide to use derivatives measuring the level of the firm exposure to risks and the cost of managing risks; for instance, the use of currency derivatives depends on the cost of managing foreign exchange-rate risk (C. Géczy, Bernadette A. Minton and C. Schrand, 1997). When firms begin to use derivatives in response to risk shocks, firms use derivatives to hedge risks with an expected benefits from hedging (Wayner R. Guay, 1999).

If markets are perfect and complete, the value of the firm is independent of its hedging policy. In an "imperfect" market, firm needs a corporate financing policy that allows to maximize the market value. A firm can hedge by trading derivatives contracts or by different real operating decision (e.g. merger). A value-maximizing firm can hedge for three reasons: 1)

politicians impose additional constraints on the firm, like taxes or in terms of accounting numbers, that imply the need to hedge accounting. If firms take positions in options markets, those hedging may reduce the variability of pre-tax firm value and the expected corporate tax liability is reduced. In other words, post-taxes value of the firm is increased; 2) also the bankruptcy costs lead to hedging. The firm has to convince potential bondholders that it will hedge after the bond sale to reduce the bankruptcy costs. But bondholders know that an increase in the value of the firm means also a redistribution of wealth from shareholders to bondholders. So, without an incentive to hedge it will be difficult for the firm to make a credibility announcement of hedge. Incentives for shareholders to adopt a hedging policy occur at least : a) when firm borrow frequently, the reputation for hedging decreases the price for its new debt; b) through hedging the firm reduce the costs of financial distress and shareholders avoid binding bond covenants that constrain its investment policy; 3) managers, employees, supplier and customers are risk adverse and require extracompensation to bear nondiversifiable risks. Managers demand higher compensations or equities if the risk of failure is greater; employees demand higher wages if the likelihood of firing is greater; suppliers pretend more guarantee- terms in long contracts and suppliers do not buy products without warranty obligations from the firm with unexpectedly large changes in firm value. Yet, if managerial compensation is related to firm value, managers have incentives to involve in their plan also market value strategies . If hedging is costly, shareholders try to discourage managers from spending excessive resource in hedging strategies. Managerial compensation also can include payment related to accounting earnings. If managers compensation depends heavily on accounting earnings, managers may pursue principally hedge accounting earnings which allow to constrain the variance of the firm economic value. If the compensation package is major related to the value of the firm, the manager is more likely to hedge. (Smith Clifford and René Stulz,1985).

Managers who receive larger option awards are less likely to hedge using derivatives because the value of the options will increase with the increase of the riskiness of the firm. While, equity holdings by the managers are positively related to the likelihood of hedging and to hedge through the use of derivatives. Further, in presence of equity ownership by institutional investors, we expect a greater probability of hedging and of hedge through a greater level of derivatives usage (Lee C. Adkins, David A. Carter and W. Gary Simpson , 2006).

Modigliani-Miller Theorem implies that with informational symmetry and perfect market assumptions, the financial hedging is irrelevant. In fact, corporate financial policy has not reflection in a market without imperfections, like transactions costs,

bankruptcy costs, taxes and so on. Firms have proprietary information and shareholders could not adopt for themselves financial strategies, because they have not that private information held by managers. However, shareholders may infer informations from price changes in securities markets. If managers compensation is a non-linear function of output, managers and shareholders interests would likely be in conflict and managers actions would only partially tend to implement the optimal hedging strategies. If managers compensation is related to the firm market value, this conflict may be resolved (DeMarzo Peter and Darrell Duffie,1991).

Shareholders do not decide about the hedging policy which are taken by managers; but, shareholders decide about managerial compensation contracts, that maximize their wealth and the value of the firm. The compensation scheme chosen by shareholders implies that their wealth is maximized under the constraint that managers receive a high level of expected utility when they work for shareholders. In other words, the compensation schedule establishes that managers compensation is related to the change in the value of the firm (René M. Stulz,1984).

Shivaram Rajgopal and Terry Shevlin (2002) investigate the relationship between employee stock options (ESOs) and managerial actions in risk taking on a sample of firms operating in oil and gas sectors. They measure the impact of the ESOs on the level of the risk assumed and find that ESOs motivate managerial investment in risky projects.

During the 1980s ESOs largely diffused favoured by their accounting treatment. In 1993 the FASB required to firms to determine the value of ESOs by using an option pricing model and charging this value on earnings or disclosed in footnotes to the financial statements. The ESOs value appears negatively related to firms stock prices, because when an option is vested it is more likely to be exercised. The unexercised option represent a cost for shareholders. In small firms, the ESO is not related to the firm share price, while in large firms, ESO value is strongly negative related to stock price. In fact, small firms are characterized by less sophisticated investors with limited capabilities in evaluation ESO (David Aboody,1996).

The use of financial hedging by managers is related also to their career concerns. The optimal hedging policy adopted by manager depends on the accounting information that are available to shareholders. In this case, the analysis is focused on the informational effect of hedging rather than on the role of hedging in transferring or sharing risks among the parties. The most important channels of this informational effect are: 1) information about the value of the shareholders options allows them to exercise their options or leave the current investment project. On the other side, managers have an incentive to hide this information to reduce the risk of their future wages; 2) information revealed by profit has a

nonlinear effect on reputation, future wage and current managers. Firms might adopt a decentralized risk-management policy in each profit of center, because decentralized hedging benefit of increasing informativeness of divisional performance reports. Starting from the assumption that managers are better informed about the source and magnitude of the firm risks, this asymmetry puts managements in a better position to hedge their risks. Shareholders judge the quality of the firm's management and investment projects on the firm's performance. In other words, current profits are related to manager reputation and future wage (Peter M. DeMarzo and Darrel Duffie, 1995).

Equityholders have also interests in support hedging when managers have private informations about an unobservable risk that affects the firm's payoffs. In firms with greater informational asymmetry equityholders will have greater benefits if the firms hedges (DeMarzo and Duffie, 1991).

Venkatachalam (1996) investigates on the issue whether the notional amounts of derivatives provides informations to market about the bank managers views on risk management and in particular on the bank level of involvement in derivatives. In other words, the notional amounts of derivatives might reveals the view about whether derivatives are used to increase or decrease risk. When market participants do not trust managers to use the derivatives to reduce risk or do not understand how derivatives are used, react negatively to derivatives usage. Most managers usually affirm that derivatives disclosed as "other than trading" are used for asset-liability management purpose, that means hedging. The FASB with the enact of SFAS 119 could help to determine how managers use derivatives.

Daniel A. Rogers (2002) investigates the effect of managerial goals on hedging policy in relation to the derivative holdings. In other words, how CEO risk taking incentives are related to corporate usage is investigated analyzing CEOs portfolios of stock and option holding. The Author detects that CEO risk taking bias are negatively related to the amount of derivative holding, because derivatives are used for hedging purpose.

Concerning the relationship between banks using financial derivatives instrument and banks lending, existing literature affirms that banks get in derivatives contracting for two reasons. First, to complement their traditional lending activities; second, to hedge risk-exposure generated from deposit taking and lending. In particular, commercial banks who use interest-rate derivatives increase their ability to provide more intermediation service, in terms of commercial and industrial (C&I) lending. In other words, derivatives markets allows banks to increase lending activities at a greater rate than banks that do not use derivatives. Thus, strong regulatory constrains on derivatives usage may determines a decrease in lending growth. (Elijah Brewer III, Bernadette A. Minton and James T.

Moser, 2000). Derivative-trading become another way to increase revenues and earnings. In other words, banks and finance corporations create money and generate profit not only through productive investment but also through the support of the financial innovation (T.Norfield, 2012).

Derivatives instruments can be used to reduce risk exposure (hedging) or to make a profit generated by the change in the value of the underlying asset (speculating). Speculators believe they have an information advantage relative to the market gained from Government or Official sources, and have a transactions cost advantage in trading (economies of scale), thereby, they view speculation as a profitable activity. Firms are more likely to speculate when CFOs compensation is highly related to the stock price sensitivity and his options is not associated with speculation. In fact, CFOs and not CEOs undertake decisions about speculation and CFO is the most responsible of derivatives positions. Internal controls have the relevant functions to monitoring and control to avoid excessive risks exposure through the access to derivatives. Firms characterized by a weak governance are more likely to incur in speculation strategies undertaken by managers. In other words, speculation may be viewed as a governance failure. To limit speculation, firms develop strong internal controls on derivatives activities, like frequently report to the Board of directors and a regular valuation of portfolio. The financial statements are not transparent about firms' speculative activities and may be related to the corporate scandals realized through the financial reporting of off-balance sheet assets.

### **3 Theoretical Propositions**

In this article are examined the potential economic consequences of imbalanced corporate strategies, who constrain managers to use derivatives to hide the losses of their bad deal (e.g. hostile takeovers). This analysis is conducted through the study of the dynamics of employment, loans, equity, fixed assets and the fair value of gains and losses on derivatives usage, with particular focus on their behavior around two specific periods: before and during the failure.

The empirical prediction of the model that have not been tested in literature are summarized below:

- Banks who are implementing imbalanced corporate strategies, hire more than their real need. We expect that two variables related of hiring (Personnel Expenses and Number of Employees) growth in before period and shrink in during period;
- The purpose of to convince the market about the good health of the firm leads the banks to increase their loans. So we expect a growth of the variables "Gross loans" in at least before period. We also expect in the same period a growth for the variable "Fixed Assets", which reveal investments in PP&E (Property, Plant and Equipment);

- After the growth of hiring and loans, also the market value increases as awards by the investors to the good job of the managers. The prediction is an increase of the proxy variable (Equity ) at least in before period.
- The ammount of dividend paid is related to the value of the firm. We expect in before period an increase in the value of the Dividends paid;
- Net Gains (losses) on Trading and Derivatives are proxies of the use of Derivatives (missing data). We expect their growth at least in before period; in other words, Net Gains (losses) on Trading and Derivatives may be a measure of the entity of derivatives instruments used before and during the failure period and we exepct their constant growth.

#### 4 Methodology

##### Data

The sample for this study consists of 137 banks, that meet two criteria: use on-balance and off-balance sheet financial derivatives and failed in 2009 after the 2008 financial crisis. Failure occur when a bank is not able to face its obligations in front of its depositors and creditors and become insolvent and illiquid. More specifically, a bank fails economically when the market value of its assets drop to a value lower than the market value of its liabilities.

The Federal Deposit Insurance Corporation (FDIC) closed 465 failed banks from 2008 to 2012 : 26 in 2008, 140 in 2009, 157 in 2010, 92 in 2011 and

51 in 2012. The list of banks failures in 2009 was compiled by FDCI official site.

The financial statement data for the empirical analysis are "hand-collected" from bank annual reports obtained from Bankscope database. Out of the 140 failures, 137 banks are covered by Bank scope, matched through company name. The sample is composed by all the banks in Bank Scope with non missing value for the variables of interest: Net gains (losses) on Trading and Derivatives, Personnel Expenses, Gross Loans, Fixed Assets , Equity, Dividend Paid, and the number of Employees.

As proxies of stock prices for the banks included into the sample are used the Equity value, while as proxies of derivatives value is used Net Gains (losses) on Trading and Derivatives. The dynamics of the variables included into the model is compared with a control group of nonfailures banks around the same period. The banks of control group choosed are the non failures banks who acquired the failures banks. The list of these 87 banks are available on FDCI official site and are matched on Bank Scope through company names. Out of them, 84 are covered by Bankscope.

The original sample included 137 banks failures and 84 nonfailures banks, after excluding banks that have missing data, become the final sample so composed: 16 banks failures and 21 peers.

Sample period investigated is 2004 to 2008 and it is divided in two sub-period: before the failure (since 2004 to 2006) and during the failure (since 2007 to 2008).

The following table presents the descriptive statistics.

**Table 1.** Descriptive Statistics in Growth Rate (Sample period is 2004-2008)

	Variable	Mean	Std.dev.	Min	Max
Failures	Net gains (losses) on	-2,879	5,632	-9,914	3,656
Banks	Trading and Derivatives				
	Personnel Expenses	1,346	1,523	-0,002	3,456
	Gross Loans	1,668	1,495	0,138	3,009
	Fixed asstes	1,638	1,119	0,165	2,890
	Dividend Paid	1,648	8,597	-9,648	11,204
	Number of Employees	0,519	1,491	-1,099	2,394
	Equity	0,269	3,621	-4,982	3,051
Non Failures	Net gains (losses) on	-1,286	3,633	-4,558	3,903
Banks	Trading and Derivatives				
	Personnel Expendure	2,462	1,335	1,253	4,255
	Gross Loans	2,697	1,214	1,439	4,227
	Fixed asstes	3,048	1,736	1,163	5,095
	Dividend Paid	2,893	9,959	-10,266	12,997
	Number of Employees	1,659	1,342	0,428	3,454
	Equity	3,533	2,770	-0,044	6,550

##### Model

This study uses a cross-sectional valuation model to examine what would happen in a multiperiod framework and the determinants of corporate

derivatives use. That model was just used from Kedia and Philippon (2009) to measure the economic consequence of earnings management and fraudulent accounting forced to financial restatements. This work replicates their analysis to empirically test the

prediction established and answer to the question of the present research.

The regression is the follow:

$$y_{it} = \beta^{before} 1_{t < \tau(i)} + \beta^{during} 1_{t \geq \tau(i)} + \Phi_t + \gamma x_{it-1} + u_{it}$$

Where:

$y_{it}$  is the variable of interest

$\beta^{before} 1_t$  and  $\beta^{during} 1_{t \geq \tau(i)}$  are coefficients who reveal if the variable of interest grows in a significantly manner in the two periods.

Before is a dummy variable for the period since 2004 to 2006 and During is a dummy variable for the failure period (2007 and 2008).

$\tau(i)$  is the failure period for bank  $i$

$\Phi_t$  is a time dummy

$x_{it-1}$  is a control variable

After including the control group of non failures banks the variables of interest are adjusted by subtracting the mean of control group:

$$\hat{g}_{it} = g_{it} - \bar{g}_{cit}$$

Where:

$\hat{g}_{it}$  is the variable of interest after the adjustment  
 $g_{it}$  is the variable of interest before the adjustment  
 $\bar{g}_{cit}$  is the mean of control group

The economic equation becomes:

$$\hat{g}_{it} = \beta^{before} 1_{t \leq \tau(i)} - \beta^{before} 1_{-3 < t < \tau(i)} + \beta^{during} 1_{t \geq \tau(i)} + u_{it}$$

The coefficient  $\beta^{before}$  and  $\beta^{during}$  explain the expected different dynamic of each variable of interest before and during the failure period. So the null hypothesis will be that  $\beta^{before} = \beta^{during}$ .

Table 1 illustrates the dynamics of failures banks comparing the behavior of the variables of interest overtime, with the null hypothesis that that  $\beta^{before} = \beta^{during}$ . The results show a significantly change around the failures in the Personnel Expendure, Fixed Assets, Dividends Paid and Market Value. Consistent with the assumptions, before the failure banks increase the number of their employees and in particular their wages increase significantly, while during the failure period the growth of number of employees is significantly lower, and in turn, also the personnel expenses. Personnel Expenses and Fixed Assets growth significantly before the failure and growth more slowly afterwards. Before the failure banks enhance significantly the amount of Dividends Paid, to obtain the shareholders support while the Management are adopting imbalanced corporate strategies. In that time the market believes in the good health of the bank and the valuation grows significantly, but after the announcement of failure the market value shrinks down. A similar dynamic is seen in the Gross Loans, which increase before the failure and decrease afterwards.

The analysis of the growth of Net Gains (losses) on Trading in derivatives shows they are flat, which is not consistent with the prediction of the fifth hypothesis. This unexpected result is not sufficient to invalid the prediction, because we are considering the sample without adjustment for the control group. To make the final sentence is necessary to analyze the adjusted sample.

**Table 2.** Dynamic of Variables in Failures Banks

Growth of Gains (losses) On Derivatives	Growth of Personnel Expenses	Growth of Number of Employees	Growth of Gross Loans	Growth of Fixed Assets	Growth of Equity	Growth of Dividends Paid
(Before)						
-0,298	0,195	0,472	0,00779	0,101	0,056	0,507
(-0,99)	(2,41)	(1,39)	(1,55)	(2,02)	(2,81)	(2,51)
(During)						
-0,3592	0,1261	0,017	-0,191	0,106	-0,535	-0,068
(-0,57)	(0,57)	(-1,54)	(-0,73)	(1,08)	(-2,67)	(-1,84)
			p-value			
(Before=During)						
0,572	0,573	0,144	0,474	0,298	0,018	0,086

Coefficients are not in bold and T-statistics are reported in bold below the coefficients.

Table 2 reports the values of the variables in the two periods, after their adjustment for the mean of the of control group. Also in this case, the analysis confirms the reduction of the number of employees and the the Personnels expenses; the reduction of the

the Gross Loans and Fixed assets. A significantly decrease is seen in Dividends Paid and market value. Net Gains (losses) on trading Derivatives shrink around the failure period confirming the relationship between the imbalanced corporate strategies, which conduct the banks to default, and the use of derivatives.

**Table 3.** Dynamic of Adjusted Variables in Failures Banks

Growth of Gains (losses) on Derivatives	Growth of Personnels Expenses	Growth of Number Employees	Growth of Gross Loans	Growth of Fixed Assets	Growth of Equity	Growth of Dividends Paid
(Before)						
-0,364	0,280	0,175	0,152	0,006	0,099	1,177
(-1,02)	(1,90)	(1,26)	(0,76)	(0,05)	(0,81)	(1,95)
(During)						
-2,741	-0,228	-0,248	-0,201	-0,175	-0,543	-1,026
(-5,50)	(-1,66)	(-1,96)	(-1,62)	(-1,36)	(-4,71)	(-3,17)
			p-value			
(Before=During)						
0,005	0,118	0,06	0,127	0,192	0,0003	0,007

Coefficients are not in bold and T-statistics are reported in bold below the coefficients.

Table 3 shows the results of testing the dynamic of non failure banks. In this case is possible to investigate the behavior of the variables of interest not only before and during the failure period, but also after that period (two years later). The Net Gains (losses) on Trading Derivatives are flat before and during the failure of the sample banks, and decrease significantly after their acquisition . It may indicate a strong effect of derivatives of failures banks on

balance-sheet of acquiring banks. The gross Loans are flat before and during the failure and decrease significantly after the acquisition of the failure banks. The Dividends Paid growth before the failure, decrease significantly during and enhance following the acquisition of failure banks and it would be interpreted as a strategy to achieve widespread support from the shareholders. Interesting, the value of the market decrease significantly during the failure period and increase faster after the acquisition of failure banks.

**Table 4.** Dynamic of Variables in Control Sample

Growth of Gains (losses) on Derivatives	Growth of Personnel Expenses	Growth of Number Employees	Growth of Gross Loans	Growth of Fixed Asstes	Growth of Equity	Growth of Dividends Paid
(Before)						
-0,414	-0,075	-0,774	-0,056	-0,062	-0,971	0,684
(-0,56)	(-0,83)	(-0,07)	(-0,94)	(-0,722)	(-0,83)	(3,10)
(During)						
-0,182	-0,067	-0,069	-0,076	-0,124	-0,216	-0,513
(-0,45)	(-1,36)	(-1,49)	(-1,85)	(-1,98)	(-3,26)	(-5,63)
(After)						
-2,559	0,103	-0,010	-0,094	0,049	0,048	-0,095
(-11,06)	(1,45)	(-0,34)	(-3,84)	(0,65)	(1,14)	(-0,32)
			p-value			
(Before=During)						
0,655	0,188	0,149	0,078	0,061	0,003	0,018
(During=After)						
0,309	0,160	0,737	0,001	0,522	0,267	0,095

Coefficients are not in bold and T-statistics are reported in bold below the coefficients.

## 5 Conclusion

In banking sector is most important to determine if banks are using deviratives to hedge or to take risks because if large banks increase their risks through derivatives the entire banking system is exposed to important potential losses related to. Otherwise, if large banks all take relevant postions in derivatives market, the failure of one may determine the failure of

many, so called "Systemic Risk" (Gary Gorton and Richard Rosen, 1995). On one side, derivatives allow shifting and hedging risks but on the other side reduce the cost of engaging in speculative transactions. Their role in the recent crisis is not clear. Likewise, establishing the risk management benefit of financial derivatives is empirically difficult (Francisco Pérez-González and Hayong Yun, 2010).

When firms recognize that external financing is expensive and it implicates a reduction in investment opportunities, firms conduct their hedging through the use of derivatives. In the meantimes, when firms do



not generate sufficient cash flow, hedging can increase firms value reducing the underinvestment problem associated with costly external financing (Gerald D. Gay and Jouahn Nam, 1998). Hedging reduces the probability of financial distress by reducing the variance of the firm value and, thereby, reduces the expected costs of financial distress (Smith Clifford and René Stulz, 1985). Also bondholders have interests to support optimal hedging to avoid exogenous bankruptcy costs. Without hedging, firms are more likely to pursue suboptimal investment projects, while hedging reduces the costs of obtaining external funds and the dependence on external financing (Myers, 1977).

Usage of derivatives increases with greater investment opportunities, increases among more geographically different firms and among characterized by high CEOs sensitivity of wealth to stock price (Wayne Guay, S.P. Kothari, 2003). In other words, the managerial wealth invested in the firm is positively related to the use of derivatives. When managers are owner of unexercised options, they can choose to increase the risk of the firm to increase the value of their options. Otherwise, in the case of derivatives are used for hedging, option holdings are negatively related to derivatives use.

Managers who receive larger option awards are less likely to hedge using derivatives because the value of the options will increase with the increase of the riskiness of the firm. On the opposite, equity holdings by the managers are positively related to the likelihood of hedging and to hedge through the use of derivatives. Further, in presence of equity ownership by institutional investors, greater probability of hedging through a greater level of derivatives usage (Lee C. Adkins, David A. Carter and W. Gary Simpson, 2006). Equityholders have also interests in support hedging when managers have private information about an unobservable risk that affects the firm's payoffs. In firms with greater informational asymmetry equityholders will have greater benefits if the firms hedges (DeMarzo and Duffie, 1991).

The literature on business ethics has examined CEOs ethical profile to explain managerial fraud and corporate scandals. For instance, CEOs lack of moral values and their high aspiration increase the likelihood of managerial fraud through the undertaking of an imbalanced corporate strategy. CEOs charismatic leadership has the power to obtain the support of stakeholders (stakeholders cohesion) while the same CEOs pursuit an imbalanced corporate strategy (Zona, Minoja and Coda, 2012).

In according with Boddy et al. (2010), the access to power, influence, prestige and money are associated with leadership corporate positions. In this view, ambitious CEOs adopt a growth strategy through, for instance, hostile takeovers (with a target firm overpaid) and to justify these acquisitions in front of stakeholders, the managers hide the losses generated

by the bad deals (e.g. too high bid price) with an accounting manipulation.

In this article are examined the dynamics of several variables (employment, loans, equity, fixed assets, the fair value of gains and losses on derivatives, gross loans and dividends paid) to detect if economic consequences of imbalanced corporate strategies constrain managers to use derivatives to hide the losses of their bad deal (e.g. hostile takeovers).

The empirical results of this study show that when banks are lead by ambitious CEOs who adopt imbalanced corporate strategies conducting to the default, hire more than their real need, increase their investments in PP&E, their loans growth faster with the purpose of to portraying themselves to the market as healthy firms. If the investors believe in these strategies, the market value increase as awards to the good job of the management but around the announcement of failure the market value drops significantly. The empirical analysis of Net Gains (Losses) on trading Derivatives detects a strong relationship between imbalanced corporate strategies, conducting to default and the use of derivatives.

As preliminary work, it has some limitations (the most important is the small sample size due to the missing data) which need to be overcome to improve the theoretical predictions. Moreover, to verify and endorse the relation between a specific imbalanced strategies (hostile takeovers) and derivatives corporate use is necessary to test the reasons of the failure to select an appropriate sample.

A full understanding of the relationship between the collapse of derivatives user with larger position and the so called Systemic Risk is a task for future research.

## References:

1. Simi Kedia and Thomas Philippon (2009): "The Economics of Fraudulent Accounting", *The Review of Financial Studies*, pp. 2169-2199
2. Mohan Venkatachalam (1996): "Value-relevance of banks' derivatives disclosures", *Journal of Accounting and Economics*, pp.327-355
3. C. Géczy, Bernadette A. Minton and C. Schrand (1997): "Why Firms Use Currency Derivatives?", *The Journal of Finance*, pp. 1323-1354
4. Smith Clifford and René Stulz (1985): "The determinants of firms' hedging policies", *The Journal of Financial and Quantitative Analysis*, pp.391-405
5. Myers Stewart C. (1977): "Determinants of corporate borrowing", *Journal of financial Economics*, pp. 147-175
6. DeMarzo Peter and Darrell Duffie (1991): "Corporate financial hedging with proprietary information", *Journal of Economic Theory*, pp.261-286
7. Eli M. Remolona (1993): "The Recent Growth of Financial Derivatives Markets", *Quarterly Review*, pp. 28-43
8. T.Norfield (2012): "Derivatives and Capitalist Markets: The Speculative Heart of Capital", *Historical Materialism*, pp.103-132

9. Douglas J. Skinner (1996) :” Are disclosures about bank derivatives and employee stock options “value-relevant?””, *Journal of Accounting and Economics*, pp. 393-405
10. Elijah Brewer III, Bernadette A. Minton and James T. Moser (2000): “ Interest-rate derivatives and banking lending”, *Journal of Banking and Finance*, pp. 353-379
11. Wayne Guay, S.P. Kothari (2003): “ How much do firms hedge with derivatives?”, *Journal of Financial Economics*, pp. 423-461
12. Brown G. (2001): “ Managing foreign risk derivatives”, *Journal of Financial Economics*, pp. 401-448
13. Robert A. Jarrow and Stuart M. Turnbull (1995): “Pricing Derivatives on Financial Securities Subject to Credit Risk”, *The Journal of Finance*, pp 53-85
14. T. Clifton Green and Stephen Figlewski (1999): “Market Risk and model Risk for a Financial Institution Writing Options”, *The Journal of Finance*, pp. 1465-1498
15. Jennifer Lynch Koski and Jeffrey Pontiff (1999): “How Are Derivatives Used? Evidence from the Mutual Fund Industry”, *The Journal of Finance*, pp. 791-815
16. Norvald Instefjord (2005): “ Risk and Hedging: Do Credit Derivatives Increase Bank Risk?”, *Journal of banking and Finance*, pp. 333-245
17. Ludger Hentschel and S.P. Kothari (2001): “ Are Corporations Reducing or Taking Risks with Derivatives?”, *Journal of Financial and Quantitative Analysis*, pp. 93-118;
18. F.Blak and M.S. Scoles (1973): “ The pricing of options and corporate liabilities”, *Journal of Political Economy*, pp. 637-654
19. M.C. Jensen and W.H.Mekling (1976): “ Theory of the firm: Managerial behavior, agency costs and capital structure”, *Journal of Financial Economics*, pp.305-360;
20. S.C. Myers (1977): “ Determinants of corporate borrowing policy”, *Journal of Financial Economics*, pp.147-175
21. P. Tufano (1996): “ Who manages risk? An empirical examination of risk management practices in the gold mining industry”, *Journal of Finance*, pp.1097-1139
22. Francisco Pérez-González and Hayong Yun (2013): “Risk Management and Firm value: Evidence from Weather Derivatives”, *Journal of Finance*, pp. 2143-2176
23. George Allayannis and James P. Weston (2001): “The Use of Foreign Currency Derivatives and Firm Market Value”, *The Review of Financial Studies*, pp. 243-276
24. Lee C. Adkins, David A. Carter and W. Gary Simpson (2007): “ Managerial Incentives and the use of Foreign-Exchange Derivatives by Banks”, *Journal of Financial Research*, pp. 399-413
25. J. Kambhu, F. Kaene and Catherine Benadon (1976): “ Price Risk Intermediation in the Overt-the-Counter Derivatives Markets: Interpretation of a Global Survey”, *FRBNY Economic Policy Review*, pp.1-15
26. Gerald D. Gay and Jouahn Nam (1998): “ The Underinvestment Problem and Corporate Derivatives Use”, *Financial Management*, pp. 53-69
27. René M. Stulz (2004): “Should we fear Derivatives?”, *Journal of Economic Perspectives*, pp. 173-192
28. Gray Gorton and Richard Rosen (1995): “ Banks and Derivatives”, *National Bureau of Economic Research*, pp. 299-339
29. Peter M. DeMarzo and Darrel Duffie (1995): “Corporate Incentives for Hedging and Hedge Accounting”, *The Review of Financial Studies*, pp. 743-771
30. Deana R. Nance, Clifford W. Smith Jr, Charles W. Smithson (1993): “ On Determinants of Corporate Hedging”, *Journal of Finance*, pp.267-284
31. René M. Stulz (1984): “ Optimal Hedging Policies”, *Journal of Financial and Quantitative Analysis*, pp. 127-140
32. Christopher C. Geczy, Bernadette A. Minton and Catherine M. Schrand (2007): “ Taking a view: Corporate Speculation, Governance and Compensation”, *The Journal of Finance*, pp. 2405-2443
33. Shivaram Rajgopal and Terry Shevlin (2002): “Empirica Evidence on the Relation between Stock Option compensation and Risk Taking”, *Journal of Accounting and Economics*, pp. 145-171
34. David Aboody (1996): “ Market Valuation of Employee Stock Options”, *Journal of Accounting and Economics*, pp. 357-391
35. Wayner R. Guay (1999): “ The Impact of Derivatives on Firm Risk: an Empirical Examination of New Derivative Users”, *Journal of accounting and Economics*, pp. 319-351
36. Daniel A. Rogers (2002): “ Does executive portfolio structure affect risk management? CEOs risk taking incentives and corporate derivatives usage”, *Journal of banking and Finance*, pp. 271-295
37. John R. Graham, Daniel A. Rogers (1999):” Is corporate hedging consistent with value maximization? An empirical analysis”, *Journal of Finance* , pp.1-33.