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## EDITORIAL

*Dear readers!*

This issue of the journal *Corporate Ownership and Control* is devoted to several issues of corporate governance.

**Ali Jebli, Nabil Khoury, Marko Savorn** seek primarily to analyze CEO holdings of stocks and options in their firm as a determinant of the decision to hedge and the intensity of hedging with option-like securities in the gold mining industry. The findings show that CEO holdings play an important role in the choice and intensity of the use of option-like hedging instruments. In addition, results also show that the intensity of option-like instrument use for hedging is diminished when the CEO is also the chairman of the board.

**P.W.A. Dayananda** considers deriving measures for assessing the benefits to firms as a result of granting executive stock option plans. The metrics developed relate to assessing the expected total earnings of the company attributed to executives due to executive stock option award. The paper derives metrics based on number of shares as well as on total value of assets. The values of these metrics can be used to compare and assess the benefits to the company in awarding stock option grants by comparing the metrics with actual realized changes in total earnings. The research work in the paper complements the empirical research of Murphy (1999) and others who found the pay-performance sensitivities due to executive stock option awards. Illustrations of the metrics are carried out to show their properties and in particular for the firm WAL-MART.

**Alain Chevalier, Agustinus Prasetyantoko** examine the financing behaviour of listed companies in Indonesia, in order to understand the micro evidence of the economic vulnerability based upon firm-level data. The findings show that there is an indication of the gearing effect phenomenon in which debt-equity ratio decreases with profitability. In such a case, firm would have higher probability not only of failing to make a return to equity holders but also failing to meet interest cost obligations.

**Esther Jeffers, Dominique Plihon** aim at understanding (I) how the capital structure of French corporations has changed and, through an empirical study, (II) how this change may have impacted their strategy.

**Enrico Maria Cervellati, Antonio Carlo Francesco Della Bina, Pierpaolo Pattitoni** examine the market reaction to the recommendation changes issued by financial analysts. We study the peculiar case of Italy where analysts have to send their reports to the Stock Exchange Commission and the Stock Exchange the same day they give it to their clients. Reports are available on the Stock Exchange

website. Our dataset includes about 5,200 reports issued on the 117 IPO firms that went public on the Italian Stock market between 1<sup>st</sup> January 1998 and 31<sup>st</sup> December 2003. We calculate abnormal returns and abnormal volumes associated with the dissemination of the reports and perform two short-term event studies: the first associated with the “report date”, i.e. the date in which the analyst gives the report to private clients; the second one with regard to the “public access date”, i.e. when the report is freely and publicly available on the Stock Exchange website.

**Maria Cristina Ungureanu** researches the specific attributes of banks that influence their regulatory and supervisory environment, which, in turn, creates a unique corporate governance framework for the banking industry. The paper emphasises the benefits and limits of regulations and supervision on banks' corporate governance and focuses its empirical results on the European Union countries.

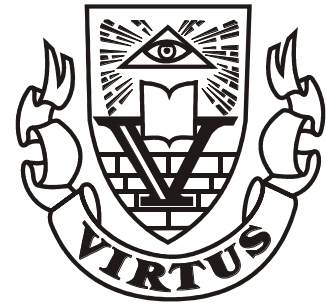
**Ai-Chi Hsu, Hsiao-Fen Hsiao** set out to examine the relationship between managerial optimism and corporate investment, and demonstrate that firms with valuable investment opportunities tend to invest less than the optimal level; the classic problem of underinvestment. On the other hand, however, firms which do not have valuable investment opportunities often tend to invest more than the optimum level; a problem of overinvestment. They present evidence on the relationship between such investment behavior and managerial optimism. Within those firms that do not have valuable investment opportunities, overinvestment is more likely to occur amongst optimistic managers than non-optimistic managers; conversely, for those firms with valuable investment opportunities, underinvestment is less likely amongst optimistic managers than non-optimistic managers.

**Mervi Niskanen** investigates the effect that bank equity claims in borrowing firms have on the availability of finance to the firm. The results suggest that allowing banks to hold equity claims in borrowing firms enhance debt availability to the firm. The results are consistent with arguments that equity claims may be helpful in transferring the benefits of an ongoing relationships to the borrowers, and thus eventually also enhance investment efficiency in the economy as a whole. The results, however, also suggest that very small or very large bank equity claims in borrowing firms do not have this impact. The results suggest that allowing banks to hold equity in borrowing firms may have some advantages. Policymakers should take this into account when reconsidering or creating regulations in this area.

# **CORPORATE OWNERSHIP & CONTROL**

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## CEO STOCK AND OPTION HOLDINGS AS A DETERMINANT OF OPTION HEDGING BY GOLD MINING FIRMS

Ali Jebli\*, Nabil Khoury\*\*, Marko Savor\*\*\*

### Abstract

This paper seeks primarily to analyze CEO holdings of stocks and options in their firm as a determinant of the decision to hedge and the intensity of hedging with option-like securities in the gold mining industry. The findings show that CEO holdings play an important role in the choice and intensity of the use of option-like hedging instruments. In addition, results also show that the intensity of option-like instrument use for hedging is diminished when the CEO is also the chairman of the board. This original finding provides additional insight into the decision making process in this context. Moreover, our results show that when non-hedgeable quantity risk and hedgeable price risk are highly correlated, gold mining firms resort to operational hedging strategies through their production flexibility. Consistent with previous studies, our findings reveal that firm liquidity and profitability are positively related to both the use option-like instruments and the intensity of such use while cost structure and debt are positively related to use intensity. But contrary to previous findings, our results show that company sales are negatively related to the intensity of using option-like hedging instruments and investment opportunities are negatively related to the intensity of such use. Finally, investment opportunities as well as the high correlation between production levels and gold prices seem to have a negative impact on the decision to use option-like hedging in the gold mining industry. Several studies have focussed on the theoretical and empirical motives of hedging financial risks with derivative products by business firms. However, relatively few studies have examined the determinants of the specific choices that firms make in order to build an optimal portfolio of these instruments, or the level of risk coverage that they achieve by using them. The issue has gained in importance recently with the increasing use of derivatives for hedging purposes under the growing impulse of globalisation and of the higher volatility of commodity and financial prices. In the same vein, the development of new types of structured products that fit the specific needs of corporate and other users, and of more sophisticated models to value them, has provided firms with a greater range of instruments to choose from and has given even more relevance to the study of the determinants of that choice. To be sure, notwithstanding their apparent differences, derivative products could be grouped according to the symmetry of their payoff vectors into non-linear, option-like, instruments and linear instruments. This paper seeks to shed light on the choice that hedging firms make in this regard by analyzing the impact of CEO holdings of stocks and options in their firm on the decision to hedge with option-like instruments. The study uses a sample of firms in the gold production industry for the period 2002-2004. By focussing on a single industry the analysis is conducted within the context of a homogeneous source of risk for all the firms concerned, namely gold price fluctuations. More specifically, the study will focus on the factors affecting the choice of the hedging instrument on the one hand and on the level of risk coverage with that instrument on the other in the context of the sample under study. The paper is organised as follows: section I provides a review of the literature on the choice between linear and non-linear, option-like, instruments for hedging financial risks. The methodology and data of the study are described in section II and the empirical results are analyzed in section III. Concluding comments are presented in section IV.

**Keywords:** corporate governance, CEO holdings, gold mining firms

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### I. Introduction

As mentioned earlier, the distinction between linear and non-linear, option-like, hedging instruments can

be done on the basis of the symmetry of their payoff vectors from the hedger's point of view. In this sense, Black (1976), Moriarty, Philips and Tosini (1981) and Culp (2004) consider futures and forwards as linear

instruments that can be used to transfer the hedger's risks and hence reduce the volatility of his cash flows at a lower cost than option-like type instruments which are non-linear and can therefore be used as risk-limiting as well as income generating vehicles.

As regards the choice of particular instruments, Brown and Toft (2002) argue that in the presence of hedgeable and non-hedgeable risks, non-linear instruments are preferable to linear instruments. In the same vein, Gay, Nam and Turac (2003) contend that, in this context, the exclusive reliance on linear instruments increases the probability of over hedging and its related costs<sup>1</sup>. To avoid this problem the authors argue that the position in linear instruments must be reduced and replaced by non-linear instruments to hedge price risk. The degree of substitution between the two types of derivatives depends on the sign and value of the correlation coefficient between prices and quantities. Then by studying a sample of 671 non-financial firms for the period 1992-1996 the authors find that, as expected, the use of non-linear instruments is positively correlated with operating income risk (a non-hedgeable risk) whereas the use of linear instruments is negatively related to it. Similarly, Detemple and Adler (1988) argue that in the context of portfolio management, investors who face borrowing constraints or high price volatility should use non-linear instruments. Tuffano (1996) however finds no significant empirical result that confirms this argument.

Moshini and Lapan (1992) argue that firms that are characterized by risk aversion and a flexible production schedule<sup>2</sup> should resort to non-linear instruments in order to optimize their hedging portfolio. On the other hand, Froot, Scharfstein and Stein (1993) contend that when cash flows and investment opportunities exhibit the same sensitivity to hedgeable risks, linear instruments can maximize the value added by the hedging activity. However, if these two sensitivities are different the maximization of the value added through hedging requires the use of non-linear instruments. Adam (2004) verified the arguments of both studies using a sample of 118 gold producing companies for the period 1989-1998. His findings however support only the arguments of Froot, Scharfstein and Stein.

Following Froot, Scharfstein and Stein (1993), Mello and Parsons (2000) and Adam (2002) show that when external funds are less expensive than internal funds<sup>3</sup>, the hedging portfolio should mainly include long puts in order to generate additional payoffs only

in those states of the world where the firm is facing a deficit. However, if external funds are more expensive than internal funds, the hedging portfolio should include mainly short calls to substitute for the use of debt. Finally, if the costs of internal and external funds are similar, the portfolio should contain collars. Furthermore, Adam also shows that firms that have a low debt ratio, that do not have investment opportunities and that are exposed to a low level of non-hedgeable risk are more likely to use linear instruments.

From a different perspective, Thornton, Kim and Nam (2005) investigated the relationship between administrators' preference for linear or non-linear derivatives and the presence of call options in their compensation package. They find a positive and significant relationship between the number of call options owned by administrators and the use of non-linear instruments. These findings confirm those reported by Tuffano (1996) for gold producing firms.

## II. Data and Methodology

The dataset for this study is made up of 315 firm-quarters in the gold mining sector. The choice of sample length and frequency is based on data availability and was made to insure adequate representation of the problem to be analyzed. As mentioned in previous studies such as those of Tuffano (1996), Dionne and Garand (2003), Savor (2004), Dionne and Triki (2004), the gold mining sector provides an interesting opportunity for risk management studies. Firms in this sector are exposed to a common source of risk, fluctuating gold prices, for which a wide variety of hedging instruments is available. In addition, the details of gold mining firms' diverse risk management strategies are often readily available in their financial statements. These statements are used in our study to supplement data obtained from the Gold Hedging Indicator publications for the period 2002-2004. The resulting dataset is thus comprised of quarterly observations for 38 different gold mining firms that have used some form of hedging strategy between the first quarter of 2002 and the last of 2004. In total 29.0% of the firms that used some form of hedging did not use any options throughout the sample period, 52.6% used options in combination with other hedging instruments, while 18.4% used only options to hedge their exposure to gold price fluctuations. It should be noted that this dataset is limited to firms that show non-zero levels of risk management. The empirical results that will follow should therefore be interpreted as pertaining to the use of option-like instruments by firms that actively manage their exposure to risk.

Two models will be used to analyse the determinants of option use in risk management portfolios. The first model uses a PROBIT specification to estimate how a set of determinants based on the existing literature affect the probability of using option-like hedging instruments given that

<sup>1</sup> Overhedging costs occur when production falls below the quantity sold by the futures contract and at the same time prices increase.

<sup>2</sup> Production flexibility is defined as the possibility to modify certain production parameters when market prices change.

<sup>3</sup> The author calls the difference between the costs of internal and external financing as "credit risk premium".

the firm actively hedges its exposure to gold price fluctuations. In equation (1) the determinants used in the model are grouped according to the strands in the literature reviewed in the previous section. The dependent variable (Option indicator) is equal to 1 when the firm uses option-like hedging instruments in a specific quarter and zero if only non-option-like instruments are used in the quarter. More specifically the model is defined as follows:

$$\begin{aligned} \text{Option indicator} = & \beta_0 + \beta_1 \text{CEO\_SHARES} + \beta_2 \text{CEO\_OPTIONS} + \beta_3 \text{CHAIR} + \beta_4 \text{Q\_VARIABILITY} + \\ & \beta_5 \text{Q\_CORRELATION} + \beta_6 \text{VOLATILITY} + \beta_7 \text{M\&A} + \beta_8 \text{EXPLORATION} + \beta_9 \text{TANGIBLE} + \beta_{10} \text{OPPORTUNITY} + \beta_{11} \text{CASH\_COST} + \beta_{12} \text{LN\_SALES} + \\ & \beta_{13} \text{LT\_DEBT} + \beta_{14} \text{D/E} + \beta_{15} \text{CASH} + \beta_{16} \text{PROFITABILITY} + \varepsilon \end{aligned} \quad (1)$$

Where

*CEO\_SHARES* is the market value of the CEO's company shares;

*CEO\_OPTIONS* is the number of company options held by the CEO;

*CHAIR* is an indicator variable equal to 1 if the CEO is also the chairman of the board and zero otherwise;

*Q\_VARIABILITY* is the standard deviation of the percentage change in quarterly production quantities;

*Q\_CORRELATION* is the correlation between production levels and gold prices;

*VOLATILITY* is the standard deviation of gold prices for the 8 previous quarters;

*M&A* is the ratio of acquisition expense to tangible assets;

*EXPLORATION* is the ratio of total exploration costs to total assets;

*TANGIBLE* is the ratio of tangible assets to total assets;

*OPPORTUNITY* is equal to (book value of the firm – the book value of equity + the market value of equity) divided by the book value of total assets;

*CASH\_COST* is the firm's cash production cost per ounce of gold;

*LN\_SALES* is the natural logarithm of the firms quarterly sales;

*LT\_DEBT* is the long term debt ratio;

*D/E* is the debt to equity ratio;

*CASH* is the ratio of cash and cash-like securities to total short term assets;

*PROFITABILITY* is the ratio of the difference between the gold spot price and the firm's cash cost to the firms cash cost.

The second model seeks to determine the degree to which firms use option-like instruments in proportion to their overall hedge portfolio. Given that this proportion is censored at 0, a TOBIT specification is used to estimate the model. More specifically, the degree to which firms use option-like instruments in their hedging strategy is computed using a variation of the delta% measure proposed in Tuffano (1996). That measure is essentially the

adjusted level of hedged production for the next three years scaled by the firms anticipated production over the same period. The adjustment introduced in this paper uses an estimate of the sensitivity of the various financial instruments in the firm's risk management portfolio to small changes of the underlying security, in this case, gold. Hedged production levels are therefore weighted by the sensitivity of the specific contracts used by the firm. By contrast, the measure proposed by Tuffano (1996) represents the sensitivity of the overall hedge portfolio to small variation in the gold price and can be estimated using the sensitivity and weight of each individual component of the risk management portfolio. In our study, the relative importance of option-like instruments is computed by dividing this measure for the option-like instruments in the hedge portfolio by the firm's measure of the overall risk management strategy including all hedge instruments. Alternatively, the measure represents the proportion of the firm's production hedged using option-like instruments divided by the proportion of the firm's production hedged using all instruments.

The average proportion of option-like instruments in the hedge portfolio is 38.6% with a standard deviation as high as 42.5%. This variability remains an important part of this study and is analyzed using a TOBIT specification of a variation of model (1) where the dependent variable is the proportion of option-like instruments in the firm's risk management portfolio as follows:

$$\begin{aligned} \% \text{OPTION} = & \beta_0 + \beta_1 \text{CEO\_SHARES} + \beta_2 \text{CEO\_OPTIONS} + \beta_3 \text{CHAIR} + \beta_4 \text{Q\_VARIABILITY} + \\ & \beta_5 \text{Q\_CORRELATION} + \beta_6 \text{VOLATILITY} + \beta_7 \text{M\&A} + \beta_8 \text{EXPLORATION} + \beta_9 \text{TANGIBLE} + \beta_{10} \text{OPPORTUNITY} + \beta_{11} \text{CASH\_COST} + \beta_{12} \text{LN\_SALES} + \\ & \beta_{13} \text{LT\_DEBT} + \beta_{14} \text{D/E} + \beta_{15} \text{CASH} + \beta_{16} \text{PROFITABILITY} + \varepsilon \end{aligned} \quad (2)$$

Dionne and Triki (2004), argue that manager risk aversion and the sensitivity of their personal wealth to company variability may affect their risk management decisions. The authors suggest that the greater the managers' aversion to risk, and the larger the fraction of their portfolios invested in their company's securities, the more likely they are to hedge firm risk even if such hedging may not always be optimal for the firm's shareholders. Smith and Stulz (1985) also show that when managers hold a large portfolio of shares in their company, they are more likely to hedge at the firm level to the extent that such hedging is less costly than if they had hedged their portfolio themselves. The authors also show that option holdings by managers are inversely related to company hedging and may actually provide managers with an incentive to increase company variability. In order to integrate such effects, our study focuses on CEOs holdings of their company's securities. More specifically, the market value of the CEO's company shares (*CEO\_SHARES*) as well as the number of the company's options (*CEO\_Options*) he holds is used to

measure the sensitivity of the CEO's portfolio to fluctuations in company value. The market value of the CEO's shares (CEO\_SHARES) is measured by multiplying the number of shares declared in quarterly statements by the closing price at the last day of each quarter. In this regard, the preliminary analysis of our dataset shows that the CEO's holdings in our sample vary greatly. Indeed, the average market value of company shares held by CEOs is just over 3.5\$ million and ranges from 0 to over 104\$ million with a standard deviation of over 12\$ million. On the other hand, the average number of options they hold is just under 1.2 million with a standard deviation of almost 1.5 million options. To further strengthen this aspect of our study, we introduce a variable to indicate if the CEO is also chairman of the board (CHAIR) in order to assess his influence over the firm's hedging decisions. Preliminary results show that this situation exists in 23% of the overall sample.

Although the price of gold can be hedged, gold mining firms remain exposed to production risks. More specifically, the risk associated with gold production quantities cannot be hedged using conventional financial instruments. To measure the impact of such unhedgeable risk, our study incorporates the impact of the standard deviation of percentage changes in quarterly production quantities (Q\_VARIABILITY). Given that greater production variability will lead to additional uncertainty, this variable is expected to be positively related to the use of options as a hedging vehicle. On the other hand, given that firms can adjust production quantities according to gold prices, production flexibility may provide a natural hedge. To take account of these factors, the correlation (Q\_CORRELATION) between production levels and gold prices is also included in the model and is expected to be negatively related to option use. Again, a great deal of variability can be observed in this regard in our dataset. Indeed, production variability ranges from 0% to a maximum of 576% while its correlation coefficient ranges from -96.3% to 99.0%. The overall market volatility (VOLATILITY), which is expected to be negatively related to the use of option-like instruments given the positive relationship between option prices and the underlying volatility, is also included in the analysis. The measure is estimated by computing the standard deviation of gold prices for the last 8 quarters.

The possibility of financial distress is captured in our model through several measures all of which are expected to have a positive relationship with option use in risk management portfolios. First, the firm's cash cost of production per ounce of gold (CASH\_COST), which provides a measure of the firm's cost structure, is included in the model to reflect its exposure to the risk of operational costs. Second, the natural logarithm of sales (LN\_SALES) is added as a surrogate for the firm's size and its sensitivity to market fluctuations. Finally, the long term debt ratio (LT\_DEBT) and debt to equity (D/E)

ratio are also used to measure the firm's financial risk exposure.

Froot, Scharstein and Stein (1993), and Adam (2003) show that if the firm's capital investment level relatively low (high), the likelihood of using options in its risk management strategy is decreased (increased). Consequently, our model integrates three measures of the firm's investment program, namely: external acquisitions (M&A), which are assessed using a ratio of the firm's acquisition expenses divided by the book value of tangible assets, total exploration costs divided by total assets (EXPLORATION), and the value of tangible assets divided by total assets (TANGIBLE). In addition, Huang (2003) argues that firms with greater investment opportunities are more likely to see their market value appreciate. To safeguard their market value appreciation potential, these firms are more likely to hedge with option-like instruments where the payoff vector is not limited on the upside. This consideration is included in our model through a measure of the firm's market value relative to its book value (OPPORTUNITY). More specifically, the measure divides the total book value of assets minus the book value of equity plus the market value of equity by the total book value of total assets.

Stulz (1996) shows that firms in good financial health may not need to hedge as much as others. Alternatively, greater financial health, all other factors constant, may allow the firm to better support the premiums associated with option hedging. To the extent that financial health is related to the firm's financial constraints as measured by the variables discussed in the previous section, firms with more liquidity and/or greater profitability should be more likely to use option-like hedging instruments. The model integrates this possibility by including a measure of liquidity computed by dividing cash and cash-like securities by total short term assets (CASH). In addition, the profitability effect is analysed using Adam's (2004) measure whereby the difference between the gold spot price and the firm's cash cost is divided by the firm's cash cost (PROFITABILITY).

### III. Empirical Results

The empirical analysis begins with an examination of gold mining firms' likelihood of using option-like instruments in their risk management portfolio. To conduct this analysis, the model in equation (1) is estimated using a PROBIT specification where the dependent variable is an indicator of whether or not the firms have used options in a given quarter. The impact of the specified determinants is then assessed in an effort to determine the drivers of option-like instruments use. The analysis then proceeds to examine the proportion of option-like hedging instruments used with respect to the overall risk management portfolio. To this end, the model in equation (2) is estimated using a TOBIT specification

where the dependent variable is the extent of option use.

In what follows we discuss the results of the analysis first in terms of the likelihood of using option-like risk management instruments, as presented in table 3.1, and then in terms of the intensity of such use given that the firm has decided to use a non-zero level of risk management using financial instruments, as presented in table 3.2.

### Tables 3.1 and 3.2 here

#### CEO Impact

Consistent with expectations, the CEO stock and options holdings in the firm are related to the firm's use of options in a statistically significant manner. Previous studies have shown that the propensity to hedge and the extent of company hedging are positively related to management share holdings and inversely related to their options holdings. Our findings add an interesting dimension by showing that in the event that firms decide to hedge their risk, the likelihood of including options in the company portfolio is positively related to both the value of CEO shares in the firm and to the number of options he/she holds.

In this regard, previous results, such as those of Smith and Stulz (1985), Tufano (1996) and Dionne and Triki (2004) have shown that, generally speaking, when managers hold options in their firm they are less likely to hedge its risk. The literature also shows that the more the CEO's compensation package includes options the less he / she will resort to the use of risk management instruments in general, since the value of such options is a positive function of the firm's volatility. However, in this context, our results, presented in table 3.2, show that when risk management instruments are used, the extent of option use in the company hedging portfolio is positively related to CEO option holdings. Indeed, when the firm hedges its price risk, option-like hedging instruments allow managers to benefit from potential increases in gold prices while limiting the impact of potential decreases of personal holdings. The non-linearity of the risk management portfolio of the firm thus mirrors that of the CEO's compensation package. Furthermore it is also interesting to note that the extent of option use is negatively related to the CHAIR variable. More specifically, the results show that when the CEO is also the chair of the board, the firm is less likely to use options in its portfolio. Correlation results also indicate that the CHAIR variable is reasonably independent of the level of stock holdings of the Chair-CEO in the firm. Thornton, Kim and Nam (2005) argue that option use in company risk management is conditioned by the CEO's utility function. Our contention is that in view of his/her increased personal liability to shareholders and employees combined with the increased concern with financial markets' reaction to his / her policies,

the CEO-Chair's interests may be better served by a smoother progress of the firm's cash flow, which is more consistent with linear rather than non-linear risk management instruments.

#### Production risk

The results of the PROBIT analysis also show that, as expected, option use is negatively related to the firm's production flexibility. More specifically, table 3.1 provides evidence that the correlation between the firm's production levels and gold prices has a negative impact on its option use. Adam (2004) argues that production flexibility stems from the real options embedded in the firms' operating strategy. These imbedded options may lead to non-linearity in the firm's production function that can easily be made to match non-linear payoffs such as those of option-like hedging instruments. Hence, the negative relationship between production flexibility and the use of options by the firm is not surprising and provides further support for Adam's (2004) results. In the same vein, Gay, Nam and Turac (2003) also show that firms are less likely to use options when their production activity can be adapted to the fluctuations in their prices. Although the positive sign of the quantity risk relationship is consistent with these previous studies, we do not find the relationship to be statistically significant.

#### Investment opportunities

Table 3.1 also shows that for the period under study, the use of options by gold mining firms is negatively related to the firm's level of external investments through acquisitions and to its investment opportunities as measured by the market to book ratio. These results suggest that firms that invest more in acquisitions and have more investment opportunities are less likely to use options in their hedging portfolio.

Other results show that the firm's investment strategy also affects the extent of its options use. Consistent with the results pertaining to option utilization, the level of company external investment through acquisitions appears to be negatively related to the level of option use. Table 3.2 also shows that the firm's internal investments in exploration are also negatively related to its option use. A possible explanation could be that as gold mining firms require more internal funds for their investment may be less willing to allocate liquidity towards option premium thus preferring non-linear risk management instruments.

#### Financial constraints

Interestingly, our findings do not provide evidence of a relationship between option use and the measures of financial constraints. The firm's cash cost structure, size and debt levels are not found to be related to its



option use in a statistically significant manner. Bodnar, Hayt, and Marston (1998) report that firms that hedge with instruments other than option-like securities do so, among other reasons, to avoid the initial costs of option premiums. This contention may be further supported by this study's finding of a positive relationship between option use and both the firm's liquidity and its profitability. Firms with more liquidity and greater profitability may be in a better position to support option premiums. It should, however, be noted that liquidity may provide a substitute vehicle for hedging. Indeed firms with greater liquidity/profitability may be in a better position to absorb potential downfalls and thus may be less likely to hedge, in general. This study provides evidence supporting the fact that, if a firm hedges at all, it is more likely to use options the better its liquidity and profitability.

Consistent with previous studies, table 3.2 shows that both liquidity and profitability are positively related to the level of option use by the firm. This result provides further evidence that option hedging is associated with the firm's capacity to disburse the initial premiums of option-like securities. Interestingly, table 3.2 shows that, for gold mining firms that engaged in risk management between 2002 and 2004, the extent of option use is negatively related to firm size as measured by the natural logarithm of sales. In addition, both the firm's cash cost of production and debt ratio are positively related to the level of option use. It could be argued that smaller firms with more expensive operating cost structures and more debt may be more financially constrained than their larger counterparts irrespective of their short term liquidity position. In this case, our findings appear to be consistent with those of Detemple and Adler (1988) who argue that the extent of option use is positively related to the likelihood of financial constraints. A potential problem with the result that relates debt levels to risk management is that debt, as argued in Dionne and Triki (2004), may not be exogenous to the model. Since risk management affects the firm's risk characteristics and consequently its ability to support debt, hedging decisions may not be fully independent of its financial structure. However, to the extent that model (2) standardizes the level of option hedging by the level of overall risk management, the approach may at least partially control for potential endogeneity by measuring the extent of option use in proportion to the extent of overall risk management.

#### IV. CONCLUSION

This paper seeks primarily to identify the determinants of hedging with option-like securities in the gold mining industry. This industry offers several interesting characteristics that make it an ideal candidate for risk management research. Indeed, the gold mining firms are exposed to a common source of price risk – fluctuating gold prices – for which a great

variety of hedging instruments are readily available. This situation has led to a wide range of observable risk management strategies within the industry. This study focuses, more specifically, on the determinants of the choice of option-like hedging strategies observed within a representative sample of North American gold mining firms that have used some form of risk management securities during the period 2002-2004. The study analyses two aspects of the use of non-linear hedging instrument. First, a PROBIT specification looks at the determinants of decision to use non-linear hedging instruments given the existence of some form of risk hedging with financial instruments. Secondly, the intensity of option-like instrument use is analysed using a TOBIT specification to account for the dependent variable being censored at zero.

The first main result shows that CEO holdings of company stocks and options play an important role in the choice and intensity of the use of option-like hedging instruments in the gold mining industry. Indeed, our study shows that both decisions have a significant positive relationship with the value of CEO stocks and number of option held in the company. This result is consistent with previous findings of the relationship between risk management in the firm and managerial holdings of its securities, in general. However, when the CEO is also chairman of the board, the intensity of using option-like hedging instruments is diminished relative to when the CEO does not cumulate both positions. This original finding provides additional insight into the decision making process in this context and reflects the fact that the Chairman-CEO may be more concerned with his / her personal responsibility to shareholders and employees as well as with the market reaction to his / her policies, which are better served by linear risk management instruments. Another important result shows that liquidity and profitability are positively related to both the decision to use option like hedging instruments and the intensity of such use even though the relationship with profitability is somewhat weaker. This finding supports previous work that shows that option use increases when the firm is less subject to financial constraints.

Other interesting results indicate that when the correlation between production levels and gold prices – the primary source of price risk – is high the likelihood of using non-linear hedging instruments is low. This finding indicates that when non-hedgeable quantity risk and hedgeable price risk are highly correlated; gold mining firms can resort to operational hedging strategies made possible by their production's flexibility. Moreover, contrary to previous findings for non-financial firms, our results show that for gold mining firms, company sales are strongly negatively related to the intensity of non-linear hedging instruments utilization. A possible explanation for this result could be that larger firms have a potentially better access external financing and are more likely to

have diversified operations which may reduce their need for hedging with non-linear instruments. On the other hand, this intensity of using non-linear hedging instruments is positively related to the firm's cost structure and debt although the relationship is weak. This last result is consistent with the financial literature that shows a positive relationship between operational and financial risk and the firm's propensity to hedge.

With regard to the firms' investment strategy, our results show that, contrary to expectations, the firms level of external investments, as measured by its acquisitions, is negatively related to both the firm's non-linear hedging use and the intensity of such use. Results also show that its exploration costs - a measure of internal investment - are negatively related to the proportion of option-like hedging securities in the risk management portfolio. In addition, contrary to previous results relating to non-financial firms, our results show that in the gold mining industry, investment opportunities are negatively related to the decision to use options to hedge the price risk of gold.

In sum, by focussing on a single industry, our study was able to abstract from differences in the sources of risk and their impact on hedging decisions. Furthermore, the availability of information on the hedging strategies of the firms in this industry makes for an interesting venue for risk management research. As other industries make their risk management practices more readily available, future research may extend the study's results to other contexts with homogenous sources of risk and assess how firms characteristics affect their hedging portfolio composition.

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## Appendices

**Table 3.1.** The decision to use options

This table provides results for model (1) where a PROBIT model is used to estimate the impact on the decision to use options by firms that actively manage their risk. The dependent variable is equal to 1 if the firm uses options in its risk management portfolio and zero otherwise. The model regressors include *CEO\_SHARES*, the market value of the CEO's company shares, *CEO\_OPTIONS*, the number of options held by the CEO, *CHAIR*, an indicator variable equal to 1 if the CEO is also the chairman of the board and zero otherwise, *Q\_VARIABILITY*, the standard deviation of the percentage change in quarterly production quantities, *Q\_CORRELATION*, the correlation between production levels and gold prices, *CASH\_COST*, the firm's cash production cost per ounce of gold, *LN\_SALES*, the natural logarithm of the firm's quarterly sales, *LT\_DEBT*, the long term debt ratio, *D/E*, is the debt to equity ratio, *M&A*, the acquisition expense divided by tangible assets, *EXPLORATION*, the total exploration costs divided by total assets, *TANGIBLE*, the tangible assets divided by the total assets, *CASH*, is the ratio of cash and cash-like securities to total short term assets, *PROFITABILITY*, is the ratio of the difference between the gold spot price and the firm's cash cost to the firm's cash cost, *VOLATILITY*, the standard deviation of gold prices for the 8 previous quarters, and *OPPORTUNITY*, the book value of debt + the market value of shares divided by the book value of total assets.

Variables	Estimated coefficient	t-Statistic	P-Value
CEO_SHARES	6,71 <sup>E</sup> -04	4,6800	0,000***
CEO_OPTIONS	9,24 <sup>E</sup> -07	3,9700	0,000***
CHAIR	-0,1599	-0,3500	0,726
Q_VARIABILITY	0,0711	0,1900	0,849
Q_CORRELATION	-0,5489	-2,1200	0,034**
CASH-COST	0,0040	1,5800	0,113
LN_SALES	0,1362	1,1600	0,244
LT_DEBT	0,1891	1,2200	0,223
D/E	-1,9765	-1,1400	0,253
M&A	-8,8446	-2,5400	0,011**
EXPLORATION	3,3035	0,5100	0,608
TANGIBLE	0,0769	0,0500	0,962
CASH	0,0070	4,0700	0,000***
PROFITABILITY	0,0969	1,8400	0,065*
VOLATILITY	-0,0167	-0,9300	0,351
OPPORTUNITY	-0,8502	-3,6300	0,000***
Constant	-1,9247	-1,2900	0,199
Number of observations			178
Log Likelihood			-65,83
Pseudo R <sup>2</sup>			0,4567
Prob > Chi 2			0,00

\*\*\* statistically significant at a 1% level  
 \*\* statistically significant at a 5 % level  
 \* statistically significant at a 10% level

**Table 3.2.** The extent of option use

This table provides results for model (2) where a TOBIT model is used to estimate the impact on the extent of options use by firms that actively manage their risk. The dependent variable is the proportion of options in the firm's risk management portfolio as a percentage of their overall coverage. The model regressors include *CEO\_SHARES*, the market value of the CEO's company shares, *CEO\_OPTIONS*, the number of options held by the CEO, *CHAIR*, an indicator variable equal to 1 is the CEO is also the chairman of the board and zero otherwise, *Q\_VARIABILITY*, the standard deviation of the percentage change in quarterly production quantities, *Q\_CORRELATION*, the correlation between production levels and gold prices, *CASH\_COST*, the firm's cash production cost per ounce of gold, *LN\_SALES*, the natural logarithm of the firm's quarterly sales, *LT\_DEBT*, the long term debt ratio, *D/E*, is the debt to equity ratio, *M&A*, the acquisition expense divided by tangible assets, *EXPLORATION*, the total exploration costs divided by total assets, *TANGIBLE*, the tangible assets divided by the total assets, *CASH*, is the ratio of cash and cash-like securities to total short term assets, *PROFITABILITY*, is the ratio of the difference between the gold spot price and the firm's cash cost to the firm's cash cost, *VOLATILITY*, the standard deviation of gold prices for the 8 previous quarters, and *OPPORTUNITY*, the book value of debt + the market value of shares divided by the book value of total assets.

Variables	Estimated coefficient	t-Statistic	P-Value
CEO_SHARES	1,01 <sup>E</sup> -05	4,1000	0,000***
CEO_OPTIONS	1,80 <sup>E</sup> -07	5,7200	0,000***
CHAIR	-0,1539	-2,4800	0,014**
Q_VARIABILITY	-0,0062	-0,1800	0,858
Q_CORRELATION	0,0156	0,3800	0,702
CASH-COST	0,0005	1,7900	0,076*
LN_SALES	-0,0761	-4,2200	0,000***
LT_DEBT	0,5119	1,9000	0,059*
D/E	0,0089	0,5400	0,589
M&A	-1,1134	-2,1000	0,037**
EXPLORATION	-0,5173	-1,7600	0,080*
TANGIBLE	-0,2338	-1,0600	0,291
CASH	0,0011	8,3800	0,000***
PROFITABILITY	0,0114	1,9100	0,058*
VOLATILITY	0,0029	1,0200	0,308
OPPORTUNITY	0,0003	0,0100	0,993
Constant	0,1653	0,8100	0,419
Number of observations			174
Log Likelihood			-8,68
Pseudo R <sup>2</sup>			0,89
Prob > Chi 2			0,00

\*\*\* statistically significant at a 1% level  
 \*\* statistically significant at a 5 % level  
 \* statistically significant at a 10% level

## RISK METRICS: ASSESSING EXECUTIVE STOCK OPTIONS PLANS

P.W.A.Dayananda\*

## Abstract

This paper considers deriving measures for assessing the benefits to firms as a result of granting executive stock option plans. The metrics developed relate to assessing the expected total earnings of the company attributed to executives due to executive stock option award. The paper derives metrics based on number of shares as well as on total value of assets. The values of these metrics can be used to compare and assess the benefits to the company in awarding stock option grants by comparing the metrics with actual realized changes in total earnings. The research work in the paper complements the empirical research of Murphy (1999) and others who found the pay-performance sensitivities due to executive stock option awards. Illustrations of the metrics are carried out to show their properties and in particular for the firm WAL-MART.

**Keywords:** executives, stock options, earnings, WAL-MART

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## 1. Introduction

Stock option grants have become the major component of the executive compensation as they reward the value creation better than other forms of compensation such as bonuses tied to earnings. Unlike traded stock options in the stock exchange where customers deal with already issued shares of the company, the executive stock option awards require the issue of new stocks by the company when they are exercised. Thus executive stock options (ESO) awards create a dilution of the company assets and earnings unless there is an improvement in them as a result of better executive management and performance. Issues related to executive stock options were not examined by regulatory authorities and the firms until recently when perceived wind falls of wealth to executives were publicized. Although such awards are justified on economic grounds, shareholders, financial analysts and politicians were critical of the absence of their disclosure to the public. As a result of criticisms, Financial Accounting Standard Board, FASB (FASB 123 (R)), now requires the ESO grants to be valued and included in the financial statement of the company. The issue of ESO is a risk to the firm and shareholders. A measure of such risk either on historical ground to a firm or across the firms is useful for executive compensation boards, shareholders and financial analysts. Using historical data, researchers have estimated the pay-performance sensitivities and elasticities of shareholder wealth due to executive compensation; for example in the papers by Hall and Liebman (1998), Jensen and Murphy (1990b), (Murphy (1999)). In this paper we establish formulae called metrics to estimate the expected total earnings attributed to executives due to the initiation of ESO awards. Formulae are based on earnings and the stock

price process prior to ESO grant initiation. Thus subsequent to ESO award if the company earnings improves over and above that estimated by metrics derived, one could infer that the compensation provided has been beneficial to the firm.

Thus metrics derived are useful to shareholders, financial analysts and compensation boards. We illustrate the behavior of these metrics for several cases of selected parameter values and also use the data available in the public domain for the company WAL-MART and discuss the use of the metrics.

## 2. ESO Risk Metrics

*Case 1:* A risk measure per share basis.

Let  $N$  = number of issued shares of the company and  $S(t)$  = stock price at time  $t$ ,  $t \geq 0$ .

We assume that stock price has a geometric Brownian process and is represented by  $S(t) = S(0) \exp\{X(t)\}$  where  $X(t)$  is normal with mean and variance per unit time  $\mu$  and  $\sigma^2$ .

Let  $Y^*(t)$  denote the total earnings of the company up to the year  $t$ . The random variable  $Y^*(t)$  can be negative and we assume, as it is a sum of random variables, that it is normal with mean  $\mu_*(t)$  and variance  $\sigma_*^2(t)$ . Suppose that the company has an executive stock option plan with a series of executive stock option grants exercisable at times  $\tau_1, \tau_2, \dots, \tau_m$  ( $0 < \tau_1 < \tau_2 < \dots < \tau_m$ ) with the respective exercise prices  $K_1, K_2, \dots, K_m$ .

Then the proportion of shares the executives hold at the end of the grant period  $\tau_m$  is

$$M_1 = \frac{\sum_1^m n_j I(S(\tau_j) > K_j)}{N + \sum_1^m n_j I(S(\tau_j) > K_j)} \quad (1)$$

where  $n_j$  represents the number of stock options to be exercised at time  $\tau_j; j = 1, 2, \dots, m$ . under the award. We may replace the denominator of (1) by its expectation under risk neutral measure so that it reduces to

$$M_1 = \frac{\sum_1^m n_j I(S(\tau_j) > K_j)}{E_Q[N + \sum_1^m n_j \Pr(X(\tau_j) > k_j)]} \quad (2)$$

where  $k_j = K_j / S(0)$  and  $Q$  denotes the risk neutral measure.

Suppose that the company pays dividends at a compounding rate  $\theta$  per unit time.

The effect of the management of the company will be reflected in the total earnings.

We now calculate a risk metric by evaluating the proportion of the total earnings attributable to option awards after the end of exercising the series of ESOs. Let  $V(t) = Y_*(t) - Y_*(\tau_m); t > \tau_m$ . Then assuming yearly earnings are independent,  $V(t)$  is also normal with mean  $\mu_v(t) = \mu_*(t) - \mu_*(\tau_m)$  and variance  $\sigma_v^2(t) = \sigma_*^2(t) - \sigma_*^2(\tau_m)$ . Hence the total earnings attributed to executives for the period  $t - \tau_m$  as a result of ESO awards can be evaluated. Using (2) it is given by

$$E(W_1) = E[V(t)M_1] = \frac{\sum_{j=1}^m p_j E\{V(t)I(X(\tau_j) > k_j)\}}{1 + \sum_{j=1}^m p_j \Phi\left(\frac{(r - \theta - \sigma^2/2)\tau_j - k_j}{\sigma\sqrt{\tau_j}}\right)} \quad (3)$$

Using the appendix result and computing the expectation in (3), we have

$$E(W_1) = \frac{\sum_{j=1}^m p_j \Phi\left(\frac{(r - \theta - \sigma^2/2)\tau_j - k_j}{\sigma\sqrt{\tau_j}}\right) + \rho_j^* (r - \sigma^2/2)\tau_j \phi\left(\frac{k_j - (r - \sigma^2/2)\tau_j}{\sigma\sqrt{\tau_j}}\right)}{1 + \sum_{j=1}^m p_j \Phi\left(\frac{(r - \theta - \sigma^2/2)\tau_j - k_j}{\sigma\sqrt{\tau_j}}\right)} \quad (4)$$

where  $\rho_j^*$  is the coefficient of correlation between  $X(\tau_j)$  and  $V(t)$ .

The impact on the company earnings due to the series of ESO awards is given in (4) and unless the change in actual observed total earnings of the company exceeds  $E(W_1)$  sometime after the end of

the time  $\tau_m$  the awards have not been beneficial to the company.

Case 2: A risk measure on dollar assets basis

In this case we are attempting to evaluate components of the total earnings of the firm on dollar assets basis due to the ESO awards for a period commencing from the exercise of all stock options of the series of grants; the proportion used is evaluated based on the value of the company assets rather than per share as in case 1. Then the proportion of dollar assets at time  $t$  after the end of the exercise period attributable to executives due to stock options is given by

$$M_2 = \frac{\sum_{j=1}^m n_j e^{r(t-\tau_j)} I(S(\tau_j) > K_j)}{[NS(t) + \sum_{j=1}^m n_j e^{r(t-\tau_j)} I(S(\tau_j) > K_j)]}; t > \tau_m \quad (5)$$

Again, for convenience we replace the denominator of (5) by its expectation under risk neutral measure. Hence the proportion of total earnings for the period  $t - \tau_m$  of the company to be shared with ESO holders on dollar assets basis is given by

$$W_2 = \frac{V(t) \{ \sum_{j=1}^m n_j e^{r(t-\tau_j)} (S(\tau_j) - K_j)_+ \}}{E_Q[NS(t) + \sum_{j=1}^m n_j e^{r(t-\tau_j)} (S(\tau_j) - K_j)_+]}$$

Now we derive the expected value of the expression for  $W_2$  assuming risk neutral measure for  $X(t)$ .

$$E[W_2] = \frac{\sum_{j=1}^m p_j e^{r(t-\tau_j)} E[V(t)(S(\tau_j) - K_j)I(X(\tau_j) > k_j)]}{E_Q[NS(t) + \sum_{j=1}^m p_j e^{r(t-\tau_j)} (S(\tau_j) - K_j)_+]}; t \geq \tau_m \quad (6)$$

Now using Black-Scholes formula the expectation in the denominator of (6) is given by

$$G(t) = E_Q[S(t) + \sum_{j=1}^m p_j e^{r(t-\tau_j)} (S(\tau_j) - K_j)_+] = S(0)e^{rt} + \sum_{j=1}^m p_j e^{rt} \{ S(0)\Phi\left(\frac{(r - \theta + \sigma^2/2)\tau_j - k_j}{\sigma\sqrt{\tau_j}}\right) - K_j e^{-r\tau_j} \Phi\left(\frac{(r - \theta - \sigma^2/2)\tau_j - k_j}{\sigma\sqrt{\tau_j}}\right) \} \quad (7)$$

The expectation in numerator component in (9) reduces to

$$E_Q[V(t)(S(\tau_j) - K_j)_+] = S(0)E_Q[V(t)e^{X(\tau_j)}I(X(\tau_j) > k_j)] - K_j E_Q[V(t)I(X(\tau_j) > k_j)] \quad (8)$$

Again we assume that  $X(\tau_j)$  and  $V(t)$  is bivariate normal with coefficient of correlation  $\rho_j^*$ .

Then we can derive (see Appendix)

$$E_Q[V(t)e^{X(\tau_j)}I(X(\tau_j) > k_j)] = \exp\{r\tau_j\} [(\mu_v(t) + \rho_j^* \sigma_v \sigma \sqrt{\tau_j}) \Phi\left(\frac{(r + .5\sigma^2)\tau_j - k_j}{\sigma\sqrt{\tau_j}}\right) + \rho_j^* \sigma_v(t) \phi\left(\frac{(k_j - (r + .5\sigma^2)\tau_j)}{\sigma\sqrt{\tau_j}}\right)] \quad (9)$$

Hence the expression in (6) reduces to

$$E[W_2] = \frac{1}{G(t)} \{ S(0) e^{rt} \sum_{j=1}^m p_j [\mu_v(t) + \rho_j \sigma \sqrt{\tau_j} \sigma_v(t)] \Phi\left(\frac{(r-\theta+\sigma^2/2)\tau_j - k_j}{\sigma \sqrt{\tau_j}}\right) + \rho_j^* \sigma_v(t) \phi\left(\frac{k_j - (r-\theta+\sigma^2/2)\tau_j}{\sigma \sqrt{\tau_j}}\right) - \sum_{j=1}^m p_j K_j e^{r(t-\tau_j)} [\mu_v(t) \Phi\left(\frac{(r-\theta-\sigma^2/2)\tau_j - k_j}{\sigma \sqrt{\tau_j}}\right) + \rho_j^* \sigma_v(t) \phi\left(\frac{k_j - (r-\theta-\sigma^2/2)\tau_j}{\sigma \sqrt{\tau_j}}\right)] \} \quad (10)$$

One can conclude that, post exercising of ESO, the realized change in actual total earnings per dollar assets of the company must exceed  $E[W_2]$  computed in (10) for the ESO awards to be beneficial to the firm. The company directors and shareholders can now have a measure to monitor the effectiveness of the ESO grants in improving the earnings of the company.

The sensitivity of this metric with respect to share price at award is the derivative of  $E[W_2]$  at  $t = \tau_m$  with respect to  $S(0)$  (similar to Greeks) and is given by

$$\frac{\partial}{\partial S} E[W_2] = \frac{e^{r\tau_m}}{G} \left[ \sum_{j=1}^m p_j \{ \mu_v(\tau_m) + t \rho_j^* \sigma \sqrt{\tau_j} \sigma_v(\tau_m) \Phi\left(\frac{(r-\theta+\sigma^2/2)\tau_j - k_j}{\sigma \sqrt{\tau_j}}\right) + \rho_j^* \sigma_v(\tau_m) \phi\left(\frac{k_j - (r-\theta+\sigma^2/2)\tau_j}{\sigma \sqrt{\tau_j}}\right) \} - \frac{E[W_2]}{G} \left[ 1 + \sum_{j=1}^m p_j \Phi\left(\frac{(r-\theta+\sigma^2/2)\tau_j - k_j}{\sigma \sqrt{\tau_j}}\right) \right] \right] \quad (11)$$

In the granting of ESO awards, the firm might place restrictions on exercising options based on firm's total earnings. This means that exercising of options is permitted provided that the total annual earnings or the share price exceed a pre-assigned

value. Formulae for such cases can also be derived using similar computations as in deriving (4) and (10).

### 3. Numerical values for the Metrics

#### (a) Illustrations with hypothetical parameter values

We examine the metrics given by relations (4) and (10) as volatility varies for the values of the parameters :

$r=0.05, \mu_e = \$1, \theta = 0, m=2, \tau_1 = 5, \tau_2 = 10$  and

$p_j = 0.005, \rho_j^* = 0.5; j=1,2$ . The values of

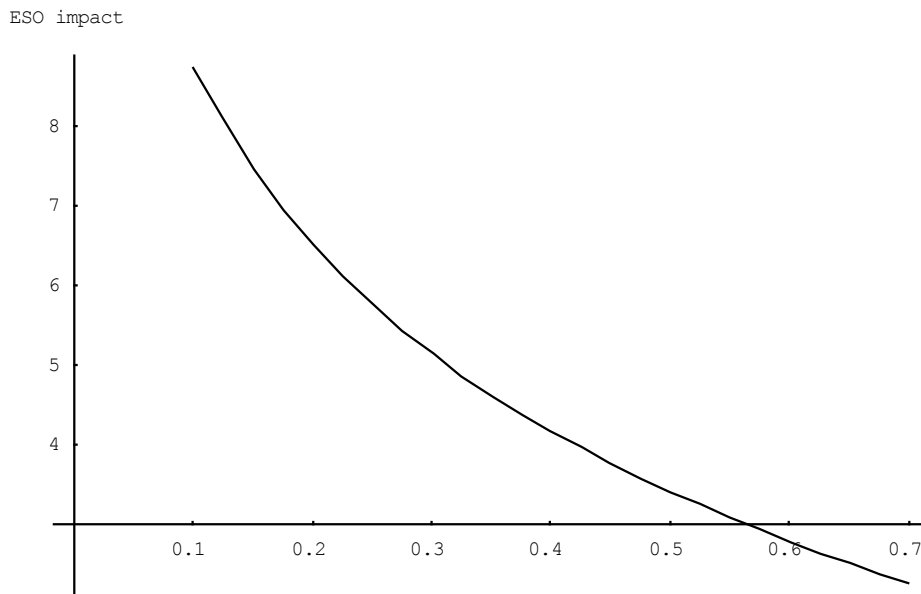
$E[W_1]$  and  $E[W_2]$  are plotted against volatility. For thousand of stock options, the earnings per share expected to be shared with executives is given by  $1000 E[W_1]$ . Given the risk free rate  $r$  specified,

$E[W_1]$  decreases as the volatility increases as shown in Plot 1. In the situation when consideration is based on dollar value of assets as in case 2, we compute the expression in (10) for varying values of volatility when the parameter values are :

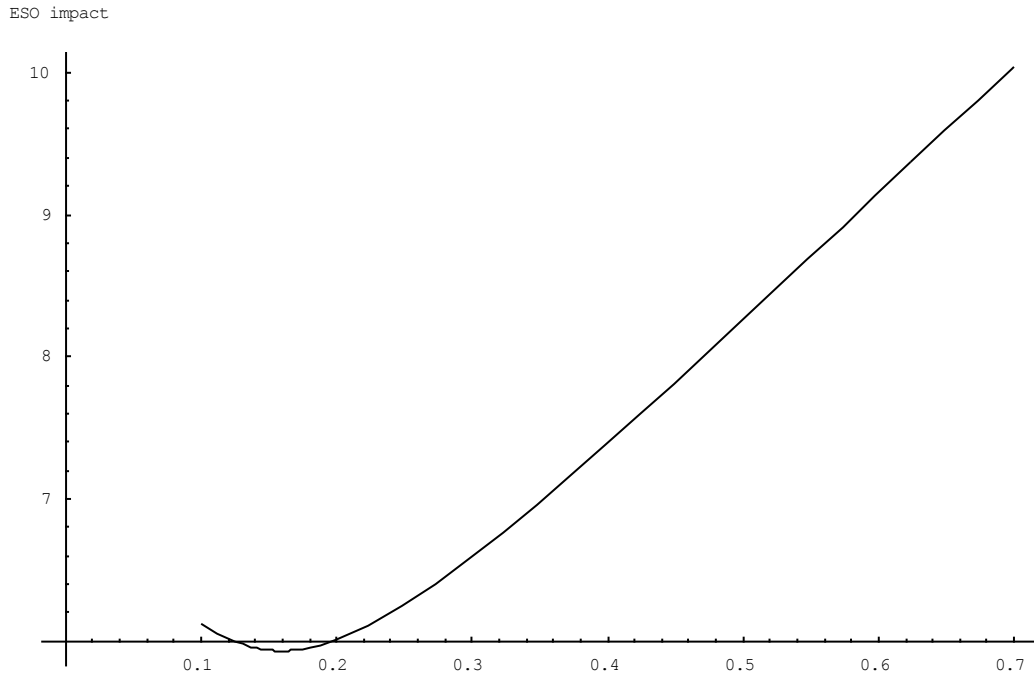
$r=0.05, \mu_v = \$1000, \sigma_v = 100, \theta = 0, m=1,$

$S(0) = K_1 = 50, p_1 = 0.005, \rho_1^* = 0.5$  and  $t = \tau_1 = 10$ . We observe from Plot 2 that  $E[W_2]$

increases with volatility unlike the situations in case 1. On the average it appears that the increase is of the order of \$9 for a firm having total earnings with mean \$1000 and standard deviation \$100. This may be compared with the empirical results obtained by Murphy (1999).



Plot 1:  $1000E[W_1]$   $\sigma$  varies



**Plot 2.** Impact of ESO on total earnings on value of assets basis

**(b) Illustrations with financial values from the firm WAL-MART**

The following details from SEC 10K filings in January 2000 by the firm and those from its own web site are used for our illustrations.

**Table 1.** ESO awards details

ESOs outstanding	Weighted average exercise price	Weighted average term in years
24,000	5.33	0.6
686,000	7.27	1.0
28,336,000	12.00	5.6
10,443,000	19.31	8.0
709,000	29.60	8.6
6,374,000	40.11	9.0
4,742,000	46.97	4.5
51,314,000	20.39	6.4

We value the metric  $E(W_1)$  as of January 31<sup>st</sup>, 2000 when its price was \$62.34 and the number of shares issued  $N=4,143,352,994$ . All the conditions required are satisfied. For the evaluation of  $E[W_2]$  we use EBIT (total earnings before interest and tax), in the WAI-MART web site and estimated  $\mu_v(t)$  and  $\sigma_v(t)$  for 2009 when all ESOs in table 1 are exercised. These values are subsequently used in the evaluation of  $E[W_2]$  given by (10) for 2009. The calculated value of  $E[W_2]$  is \$  $1.3442 \times 10^6$  showing that its EBIT should increase by this amount to regard the ESO award plan to be beneficial to the company.

For another interpretation, the Black –Scholes (BS) value of all the stock options with  $r=.05$  is evaluated to be  $\$4.88651 \times 10^9$  on 1<sup>st</sup> January 2000. It may be useful to compare this cash value of all the executive stock options with some of the metrics evaluated. For example company would expect the earning to increase after all the options are exercised. Taking the case 2, considering  $E[W_2]$  is the expected share of the total earnings for executives based on assets when all ESOs are exercised, company should expect the change in actual total earnings realized to increase by this amount at least for the ESO awards to be beneficial to the firm. Thus comparing  $E[W_2]$  to the Black-Scholes cash value which is the incentive provided would be useful. Therefore the company



should expect the total earnings to increase by at least  $E[W_2]$ / BS value per dollar value of the awards. This ratio is 0.28 cents per 1000 dollar in this case and therefore the company may consider the awards to be beneficial provided actual total earnings increase exceed this ratio. It may be compared with the alternative measure developed and evaluated in the empirical study in Jensen and Murphy (1990b) who showed that CEO (chief executive officer) wealth change by \$3.25 for every \$1000 change in shareholder wealth.

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**Appendix**

Suppose that the random variables X, Y are bivariate normal with means  $\mu_x$  and  $\mu_y$  , standard deviations  $\sigma_x$  and  $\sigma_y$  respectively and coefficient of correlation  $\rho$  . Then the joint density is given by

$$f_{x,y}(x, y) = \frac{1}{2\pi(1-\rho^2)^{0.5}} \exp\left[-\frac{1}{2(1-\rho^2)} \left\{ \left(\frac{x-\mu_x}{\sigma_x}\right)^2 + \left(\frac{y-\mu_y}{\sigma_y}\right)^2 - 2\rho \left(\frac{x-\mu_x}{\sigma_x}\right)\left(\frac{y-\mu_y}{\sigma_y}\right) \right\}\right]. \tag{A1}$$

We first evaluate  $E[XI(Y \in B)]$  which is required in (3) where B is a region of Y. From standard results on bivariate normal distribution, we have

$$E[X|Y] = \mu_x + \rho \frac{\sigma_x}{\sigma_y} (y - \mu_y). \tag{A2}$$

Hence

$$E[XI(Y \in B)] = \int_{y \in B} \left\{ \mu_x + \rho \frac{\sigma_x}{\sigma_y} (y - \mu_y) \right\} f_Y(y) dy. \tag{A3}$$

where  $f_Y(y)$  is the marginal density of Y.

Integrating the component in (A3), we have

$$E[XI(Y \in B)] = E(X) \Pr(B) + \rho \sigma_x \int_{y \in B} \left( \frac{y - \mu_y}{\sqrt{2\pi} \sigma_y} \right) \exp \left\{ -0.5 \left( \frac{y - \mu_y}{\sigma_y} \right)^2 \right\} dy. \tag{A4}$$

Now we complete the integration in (A4) giving for any real k

$$E[XI(Y > k)] = E(X) \Pr(B) + \rho \sigma_x \phi \left( \frac{k - \mu_y}{\sigma_y} \right). \tag{A5}$$

Again for the expectation component in (11), consider the expression leading to (A4). Then for any real t ,we establish the relation

$$E[Ye^{tX} I(X > k)] = \exp[\mu_x t + .5\sigma_x^2 t^2] \left[ (\mu_y + \rho t \sigma_x \sigma_y) \Phi \left( \frac{\mu_x + t \sigma_x^2 - k}{\sigma_x} \right) + \rho \sigma_y \phi \left( \frac{k - \mu_x - \sigma_x^2 t}{\sigma_x} \right) \right]. \tag{A6}$$

## CORPORATE FINANCING BEHAVIOUR AND VULNERABILITY IN INDONESIA

*Alain Chevalier\**, *Agustinus Prasetyantoko\*\**

### Abstract

The chapter examines the financing behaviour of listed companies in Indonesia, in order to understand the micro evidence of the economic vulnerability based upon firm-level data. The findings show that there is an indication of the gearing effect phenomenon in which debt-equity ratio decreases with profitability. In such a case, firm would have higher probability not only of failing to make a return to equity holders but also failing to meet interest cost obligations. In macro sense, the high probability of firm insolvency would lead economy to the financial fragility which could easily be ended in financial crisis. However, the findings also demonstrate that listed firms in Indonesia were trying to match their debt-maturity with their asset maturity. But this strategic action was taken by big firms. Small firms tend to have limited choices in their financing strategy.

**Keywords:** debt maturity, corporate governance, financial crisis

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### 1. Introduction

In summary, the objectives of this chapter are twofold. First, investigate firm-specific and country-specific factors inducing corporate debt and debt-maturity structure in Indonesia. Second, examine whether and how financing policies change following a financial crisis. This chapter considers a balance-sheet approach in the analysis by concerning with the debt-maturity and maturity-matching behaviour of listed companies in Indonesia. Maturity matching is important by which firms should match the maturity structure of their assets with the maturity structure of their liabilities. Furthermore, the concern of this chapter resides in the corporate financing behaviour and financial fragility in the context in which financial liberalization and crisis.

Since financial liberalization and globalization, emerging countries have lifted barriers on capital movement and the impact is that emerging countries received huge capital inflows through banking system and financial market. In other way, firms in emerging countries became active players in global financial markets by which they can access easily debts in foreign currencies and in short-term maturities. Therefore, capital account liberalization enhances opportunities to growth. However, it also leads to financial crisis.

In such a global financial system, the role of the financing policies of the firms becomes central. Many studies show that Asian crisis was rooted in the bad private sector's financing behaviour. Alba, Hernandez, and Klingebiel (1999) show that in the case of Thailand, financial crisis was fundamentally caused by private debt, and that financial liberalization was the main reason for this. Dadush, Dasgupta, and Ratha (2000) point out that half of all new loans from international banks in the period preceding the crisis had maturities of one year or less, and the volume of short-term debt grew fastest in East Asia.

In this chapter, our analysis focuses, especially, on debt maturity and maturity-matching of the firm financing behaviour, in order to understand a firm fragility in Indonesia. More generally, we are also concerned with the debt-equity ratio in order to understand whether firms in Indonesia prefer debt rather than equity in financing their operation, in pre- and post-crisis period. We argue that evidences on the firm-level financing behaviour become a pivotal contribution in understanding of the root of the 1997 financial crisis in Indonesia.

Our analysis could be divided into three sections. First, it provides empirical evidence on the determinants of debt-equity, debt-maturity and internal-external choice of finance. Second, we

analyse macro and institutional specific factors inducing firm financing behaviour due to an assumption that firm financing choice may be influenced directly by macro and institutional factors. Third, we describe the different behaviour of financing choices in pre- and post-crisis period in order to understand whether financial crisis change the firm behaviour.

Many studies show that the 1997 Asian crisis is propagated by weak micro fundamental system, such as the risky financing policies of the firms. Maturity-mismatch hypothesis demonstrates that financial fragility of the country is caused by the financing behaviour of the firms in which debt maturity is high and has no matching with their asset-maturities.

The contribution of this study is to provide analysis of firm financing policies in the context of financial crisis led by financial liberalization in Indonesia. Very limited work has been done to delineate real effect of liberalization on firm level capital structure (Schmukler and Vesperoni, 2001). They further explain that there is a need to establish the link between conscious promotion of financial sector liberalization and its influence on firm level dynamic of capital structure in developing countries. However, instead of studying the impact of financial liberalization on firm capital structure, we are interested in the impact of financial crisis, as a structural break, on the behaviour of financing choices. Therefore, this study is expected to contribute on the debates of the relation between financial sector condition and firm level policies in developing countries.

We intend to describe how the debt-equity, maturity matching and the choice of internal and external finance have been happening in Indonesia during the period of study, namely 1994 - 2004. We use financial ratio data provided by Jakarta Stock Exchange (JSX) and Indonesian Capital Market Directory from ECFIN, a private company, as a basic sample, which contains 244 firms. Panel data analysis is employed in this study.

## 2. Debt Behaviour and the Crisis

### 2.1. Debt Maturity and Maturity Matching

Modigliani and Miller (1958) on his famous statement on the irrelevance of finance on investment decision suggest that the choice between debt and equity or the choice between debt in short and long maturity would not be important in determining firm value.

Meanwhile, alternative view of finance convinced that financing policies do matter on investment decision. Therefore, they give much attention on the choice of the sources of finance in supporting investment activities. Myers (1984) accentuates the importance of the financial sources by saying, "We know very little about capital structure and we do not know how firms choose the debt, equity or hybrid securities they issue". The question of which source of fund will be employed by firms for

financing their activities become a puzzle that could not be understood easily.

Meanwhile, there are several theories explaining the financing choice, especially debt maturity choice, such as agency cost hypothesis (Jensen and Meckling 1976; Myers 1977), signalling hypothesis (Flannery 1986; Diamond 1991), contracting-costs hypothesis (Myers 1977), maturity-matching hypothesis (Emery 2001; Morris 1976), and tax hypothesis (Brick and Ravid 1985).

Starting with the seminal work of Jensen and Meckling (1976) and Myers (1977), there was an argument that the suboptimal incentive effects of debt financing can be controlled by a variety of contracting mechanisms, including the use of short-term debt and restrictive covenants. According to these works, the use of these contracting mechanisms is argued to be more important for high growth firms than other choices, since these firms are more likely to face stockholder-bondholder conflicts. Lang, Ofek and Stulz (1995) support this argument.

In Jensen and Meckling (1976), in line with the argument of Berle and Means (1932), we can find the explanation that the separation between ownership and control motivates managers to allocate resources to projects that do not clearly benefit the shareholders, or alternatively they may pursue personal objectives. This argument, which is referred as agency theory, describes that if managers have discretion to choose debt maturity, they will prefer using long-term debt in order to avoid frequent monitoring by the debt market or lenders, and also because managers are concerned with minimize risk in order to prevent the firm getting into financial trouble that can imperil their jobs (Friend and Lang, 1988).

Meanwhile, Stohs and Mauer (1996) predict that a firm lengthens its debt maturity as leverage increases in order to offset the higher probability of liquidity risk and to delay exposure to bankruptcy risk. Therefore, leverage is expected to be positively related to debt maturity. They also argue that larger firms, less risky firms with longer term of asset maturities, prefer to use long-term debts. On the other hand, Myers (1977) suggests that the agency cost of under-investment can be mitigated by reducing leverage, or by shortening debt maturity. Titman and Wessels (1988) provide evidence that smaller firms issue more short-term debt than larger ones. Barclay and Smith (1995) found that larger firms have more long-term debt in their capital structure. Stohs and Mauer (1996) describe that debt maturity is negatively related to firms abnormal earning and directly related to asset maturity.

Guedes and Opler (1996) describe that a firm that finances its project with short-term debt will have risk a serious difficulty if the debt cannot be extended. Despite, a firm that finances its activities with long-term debt can sacrifice profits by needlessly risking mismanagement of resources after cash flows are returned from investment, but before they are due to debt-holders. Mitchell (1991) demonstrates that firms

facing high degree of asymmetric information choose shorter debt to minimize adverse selection costs. Inversely, She finds there is no support to the hypothesis that firms choose the maturity of debts issues to match their asset maturities.

This chapter is paying attention on the maturity-matching hypothesis in which firms try to match the maturity of assets with that of liabilities. Emery (2001) argues that firms avoid the term premium by matching the maturity of their liabilities and assets. Hart and Moore (1994) confirm matching principle by showing that slower asset depreciation means longer debt maturity. Morris (1976) argues that firms try to match the maturity of assets and liabilities because this reduces the risk that incoming cash flows might be insufficient to cover interest payments and capital outlays. Debt with shorter maturity than the maturity of assets is risky because the assets might not have yielded enough profit to repay the debt. Debt with longer maturity than the maturity of the assets is also risky because debt might have to be repaid after the assets have caused to yield income. Consequently, firms try to match the maturities of assets and debt.

Matching maturity of assets and liabilities can reduce the agency costs of debt by: (i) helping to re-establish the appropriate investment incentives when new investment is required; (ii) allowing firms to extend their debt maturity without increasing the agency costs of debt; (iii) reducing the severity of asset substitution because tangibility is an inverse proxy for the severity of asset substitution; (iv) controlling for risk and costs of financial distress; and (v) helping firms with their cash flow problem (Myers, 1977; and Antoniou et al., 2005).

Myers (1977) argues that the underinvestment problem can be mitigated by the matching principle. Firms can schedule their debt repayments in accordance with the decline in future value of assets-in-place. Therefore, matching maturity of assets and liabilities can reduce the agency costs of debt. In this case, we expect a positive relationship between debt maturity and asset maturity.

This chapter engages in the financing choice of the firms by focusing on the debt-equity choice, maturity choice or maturity-matching behavior, and internal-external choice of finance.

## 2.2. Financing Behaviour in Indonesia

There is a common understanding that financing policies of the firms have propagated macro economic vulnerability around Asian countries, including Indonesia. In many previous researches, it is shown that the rapid growth and high investment of firm-level sector in Asian region was financed by high risk leverages, mostly in short-term foreign debts, that corroborates macro economic vulnerability and financial fragility (Pomerleano 1998; Claessens *et al.* 2000; Booth *et al.* 2001; Allayannis *et al.* 2003).

There is also a good deal of anecdotal evidence suggesting that the lack of corporate governance was

significant in generating a deep and long-lasting crisis in the South East Asian economies in the late 1990s (Driffield *et al.* 2005). Meanwhile, Harvey and Roper (1999) argue that the crisis was heightened by the extra risk exposure that Asian managers induced by their leverage policies. They add that corporate managers "bet" their companies by taking greatly increased leverage in the face of declining profitability. In addition, much of the debt was foreign denominated.

In Indonesia, the absent of good corporate governance practices is commonly blamed as one of the most important factor triggering financial fragility, and then financial crisis. Most firms borrow in short-term maturity of debts for financing their long-run projects, so that they had high "maturity mismatch risk". To be worse, most lending was denominated in foreign currencies by which "currency mismatch risk" was born. In such a vulnerable micro economic condition, Indonesia's economy became highly risk from the external shocks. It is therefore evident why the 1997 currency depreciation could destabilize Indonesia's economy, which has had a fairly good macro economic performance.

This chapter deals with the behavior of the firm financing policies by comparing firm with foreign majority ownership and local one. We are also interested in how foreign-owned enterprises (FOE) are different with local ones in their financing behavior. In this chapter, we argue that financing choice of the firms is pivotal strand of corporate governance practices. We define corporate governance, in broader definition, as a constraint mechanism in decision making dealing with the organizational resources<sup>4</sup>. We therefore argue that firm capital structure choice in the financing policies decision is a pivotal element of corporate governance.

Indonesian private-sector big business and finance have been dominated by family-owned business groups, almost all of Chinese ancestry (Mackie, 1990)<sup>5</sup>. Nonetheless, Indonesian business groups' "Chineseness", and their history of relations with the government (politicians and bureaucrats), make this a highly sensitive matter. Anti-Chinese Indonesian violence in spring 1998 accelerated the flight of capital, both human and financial, out of the country (Patrick, 2001).

Meanwhile, credit market is characterized by related-bank credit in which firms can access easily short-term borrowing without enough collateral. Business groups (conglomerates) were allowed to

<sup>4</sup> We follow the definition of Corporate Governance proposed by, for example, Lazonick and Sullivan (2000); Charreaux (1997). Lazonick and Sullivan (2000) define corporate governance as a decision-making mechanism inducing resource distribution in organization, and Charreaux (1997) describe as an organizational and institutional mechanism that constraint power and influence the discretion of manager.

<sup>5</sup> Most of them were extraordinarily close to the Soeharto government and his family.

establish the commercial banks to serve the needs of other corporations within the group<sup>6</sup>. It is therefore true that relationship-based system (i.e. business group and conglomeration) accompanied by weak corporate governance in the liberalized capital market without adequate financial supervision becomes a dominant characteristic of the pre-crisis business environment in Indonesia.

In a predominantly bank-centred environment, firms more prefer to borrow short-term debt at negotiable rates, and roll over the loans usually in every six months with any negotiable conditions. In term of tax system, since 1984 interest paid on borrowings in the form of bank loans and overdrafts and other forms of credit is deductible from corporate income as a business expense. Furthermore, in line with the spirit of financial liberalization, local firms could borrow directly to overseas lenders through the issuance of promissory notes without reporting it to the Indonesian central bank or Bank Indonesia. This is the reason why Indonesian firms had large amounts of foreign-currency debt that were not officially recorded to the monetary authority.

Furthermore, since protection of long-term investment such as insurance system was relatively weak, foreign lenders more prefer to delivery credit in short-term debts. The structural or institutional environment of country therefore becomes a major source of the governance practices of the firms. In this chapter, we focus on the ownership characteristic as one important factor of institutional context of the behavior of the firms.

Meanwhile, before crisis hit in the mid of 1997, discourses on corporate governance in Indonesia were almost absent if not neglected. Crisis has disclosed issues around corporate governance and exposed them as one of the most important problems in recent Indonesia<sup>7</sup>. In the debate, ownership structure and ownership characteristic get to be one of pivotal issues. Many studies disclosed that family and state hold dominantly the ownership structure of the firms around Asian countries<sup>8</sup>. Following Table 3.1 shows the family concentration in several Asian countries. Indonesia has a highest concentrated firm measured

by top 15 families among other countries in Asian region. In Japan with *'keiretsu'* (2.8 percent) and Korea with *'chaebol'* (38.4 percent) business system have a much less concentrated-ownership than in Indonesia with *'konglomerat'* (61 percent) business model. According to Table 3.1 Indonesia and Thailand could be referred as countries with high concentration ownership structure.

Concerning to efficiency of judicial system, Indonesia has a lowest level, whereas for the corruption index, Indonesia is the worst. Concentration of family control is one side. In other side, Indonesia was also a country with high corruption and very low efficiency of judicial system. These characteristic of business environment could be cited as a dominant institutional business context in Indonesia.

Family concentration often is achieved through complex cross shareholding and pyramiding of companies. In any case, the owners appoint and control the two-tiered Board of Commissioners and Board of Directors, and top management, and are involved in all key business decisions (Simanjuntak, 2001 and Husnan, 1999).

Influenced by Dutch legal system, Indonesia has a “dual-tiered system” of corporate governance. It means that there is a separation between managers and directors or commissioners. Commissioner is representation of shareholders. Pre-crisis corporate governance system was characterized as an absence of supervision to the manager decision. Commissioners did not work. The relation between board of directors (commissioner board), managers and owners (shareholders) would contribute to the corporate governance system. In this case, corporate governance system is identified by the financing policies of the firms.

We examine the financing choice of the firms by three important proxies, namely debt-equity ration, debt-maturity and internal-external choice of finance. The behavior of corporate finance is, however, a resultant of simultaneous factors. In this research we consider several specific firm and macro economic factors as variable controlling directly the capital structure choice. However, political influence should also be important factor, but it is not examined in our study. This following Figure 3.1 show the relation of several variable examined in this research.

<sup>6</sup> See study of Claessens *et al* (1998)

<sup>7</sup> In the aftermath of the 1997 crisis, there were several organisations which are concerned with corporate governance, such as NCGC (*National Committee on Good Governance*) which produces the independent commissioners and audit committee's code of conduct, IICG (*Indonesian Institute for Corporate Governance*) which launches the 'Corporate Governance Perception Index' (CGPI) for listed-companies in Jakarta Stock Exchange (JSX), FCGI (*Forum on Corporate Governance in Indonesia*) which designs the tools of assessment for companies' CG practices, IICD (*Indonesian Institute of Corporate Directorship*) which has a major activity on CG training, and many others.

<sup>8</sup> See for example, Claessens, et.al., 1998b. Who Control East Asian Corporations?, *mimeo*, The World Bank, Washington DC.

**Table 3.1.** Family Concentration

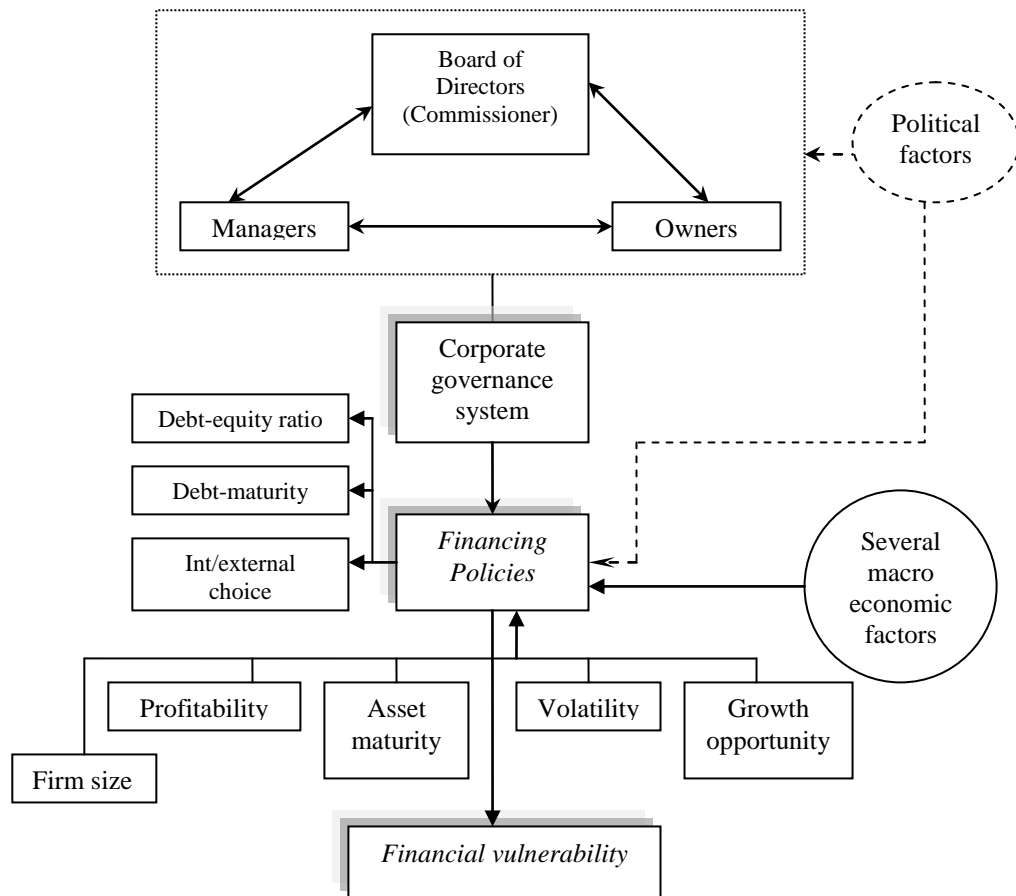
Country	Average Number of Firms per Family	% of total market capitalization that families control			
		Top 1 Family	Top 5 Families	Top 10 Families	Top 15 Families
Hong Kong	2.36	6.5	26.2	32.1	34.4
Indonesia	4.09	16.6	40.7	57.7	61.7
Japan	1.04	0.5	1.8	2.4	2.8
Korea	2.07	11.4	29.7	26.8	38.4
Malaysia	1.97	7.4	17.3	24.8	28.3
The Philippines	2.68	17.1	42.8	52.5	55.1
Singapore	1.26	6.4	19.5	26.6	29.9
Taiwan	1.17	4.0	14.5	18.4	20.1
Thailand	1.68	9.4	32.2	46.2	53.3

Source: Claessens, Djankov, Lang (1999)

**Table 3.2.** Institutional Factors

Country	Concentration of Family Control (Top 15)	Efficiency of Judicial System	Rule of Law	Corruption
Hong Kong	34.4	10.00	8.22	8.25
Indonesia	61.7	2.50	3.98	2.15
Japan	2.8	10.00	8.98	8.52
Korea	38.4	6.00	5.35	5.30
Malaysia	28.3	9.00	6.78	7.38
The Philippines	55.1	4.75	2.73	2.92
Singapore	29.9	10.00	8.57	8.22
Taiwan	20.1	6.75	8.52	6.85
Thailand	53.5	3.25	6.25	5.18

Source: Claessens, Djankov, Lang (1999)



**Figure 3.1.** Governance System and Vulnerability

Note: dashed line represents indirect effect, solid line for direct effect and dashed-dot line as a critical zone of corporate decision making or the central mechanism in governance system

Source: author

### 3. Data and Methodology

#### 3.1. Data

Data used in this study is mainly sourced from Jakarta Stock Exchange's (JSX) database and also the Indonesian Capital Market Directory, provided by ECFIN, a private company. The accounting data covers the period 1994-2004 containing firm ratio data with at least 4 consecutive years. In this study, we exclude the financial sector, since the debt structure of banks and investment institutions is not comparable to those of firms in other sectors. It is about 244 firms for the period 1994 – 2004. Since this chapter is concerned with the different period of time, we divide study into two principal different periods: pre-crisis period (1994 – 1996), and post-crisis period (1999 – 2004).

#### 3.2. Simple Model

For regression we use a simple model for panel data. Definition of each variable, both independent and dependent variables, are described below (Table 3.3). We use ordinary least square (OLS), fixed-effect and random-effect model for analyzing the panel data of firm-level financial ratio.

The equation for multivariate analysis is written as follows.

$$Y_{it} = \beta_0 + \beta_1(Size)_{it} + \beta_2(Pfit)_{it} + \beta_3(AsstMat)_{it} + \beta_4(Vola)_{it} + \beta_5(M/B)_{it} + \beta_6 X_t^{macro} + \nu_t + \varepsilon_{it} \quad (1)$$

where:

$\alpha$  is intercept;  $i$  is 1 to 244 firms;  $t$  is 1 to 11 years.  $\beta_1$  to  $\beta_6$  are coefficients to be estimated,  $\nu_t$  is time-specific effect; and  $\varepsilon_{it}$  is white-noise. Dependent and independent variables are describes in table 1 as follows.

**Table 3.3.** Definition of variables

#### Dependent Variables

1	<i>Debt-equity ratio</i>	Total debt deflated by total equity
2	<i>Debt-maturity</i>	Long-term debt deflated by total debt
3	<i>Internal-external financing choice</i>	Retained earning deflated total debt

#### Independent Variables

##### Firm Specific Factors

1	<i>Size</i>	Natural logarithm of total assets in constant (2000) local price (Rupiah)
2	<i>Profitability</i>	Earning before interest and tax deflated by total assets
3	<i>Asset Maturity</i>	Ratio of fixed assets to total assets
Continued		
4	<i>Volatility</i>	Natural logarithm of the standard deviation of the first difference in earning before interest and tax.
5	<i>Growth Opportunity (M/B)</i>	Market value of equity deflated by book value of equity

##### Macro & Institutional Factors

1	<i>Inflation</i>	$\frac{WPI_t - WPI_{t-1}}{WPI_{t-1}}$ , where WPI is wholesales price index
2	<i>Capital Market Development</i>	$\frac{Stockvalue}{GDP_N}$
3	<i>Real GDP growth</i>	$\frac{Y_t - Y_{t-1}}{Y_{t-1}}$ where Y is nominal gross domestic product
4	<i>Ownership dummy</i>	1 for firms with more than 50% of foreign ownership participation and 0 otherwise

### 4. Findings and Discussion

#### 4.1. Factors Determining Financing Policies Behavior in Indonesia

We estimate the relation between dependent variables, namely debt-equity ratio, debt-maturity, internal – external choice of finance and two groups of

explanatory variables, namely firm specific factors and macro factors. In firm specific factors, we include asset maturity, size, profitability, volatility and growth opportunity of the firm. Asset maturity represents the ratio of fixed-asset to total asset. Size is measured by logarithm of total assets. Firm profitability is proxied by the ratio of earning before interest and tax (EBIT) and total asset. Meanwhile, volatility is logarithm of

the deviation of the first difference in earning before interest, tax and depreciation. And opportunity of growth is measured by the ratio of market value of equity and book value of equity.

We also include ownership dummy to measure the ownership effect on the behavior of firm financing. We differentiate firms into those with majority foreign ownership and otherwise. Then, ownership dummy is constructed as 1 for firms with more than 50 percent foreign ownership participation and 0 for otherwise. The issue of ownership is central in corporate governance field, since it should

influence directly the strategic decision making of managerial teams, such as capital structure choice.

Despite firm specific factors, this chapter also considers some macro variables as important factors influencing firm financing behavior. We include inflation, real GDP, and the ratio of market capitalization to nominal GDP. The latter variable is included to measure the degree of domestic financial development such employed by Demirguç-Kunt and Levine (1999).

**Table 3.4.** Descriptive statistic for key variables (1994 – 2004)

	Mean	Median	Std Dev	Min	Max	Skewness	Kurtosis	Observation
Debt-equity ratio	0,6702	0,5939	0,5553	-0,9128	9,5033	5,6711	64,6959	2425
Debt maturity	0,2993	0,2119	0,3047	-0,2327	4,7485	2,2322	23,4291	2424
Internal-external finance	0,1559	0,1157	3,5974	-150,0812	34,9117	-29,7711	1267,9800	2421
Asset maturity	0,3863	0,3557	0,2975	0,0002	7,4128	7,8699	158,9109	2424
Size	22,5052	22,4817	1,4169	17,4572	26,1059	-0,1832	2,9956	2426
Profitability	0,0141	0,0366	0,2067	-2,6181	2,2396	-2,2859	30,3808	2391
Volatility	19,2273	19,3222	1,9742	12,0205	24,0573	-0,4223	3,2404	2144
Growth opportunity	1,0060	0,7416	3,4651	-74,5800	23,9278	-7,5833	164,4704	2123

**Table 3.5.** Factors Determining Debt-Equity Ratio

	Dependent variables: Debt-equity ratio		
	<i>Pooled OLS</i>	<i>Fixed-Effect</i>	<i>Random-Effect</i>
<i>Asset Maturity</i>	-0,0096 (0,0363)	-0,0763 (0,0396)	*** -0,0526 (0,0335)
<i>Size</i>	-0,0527 *** (0,0103)	-0,1601 *** (0,0242)	*** -0,0580 *** (0,0112)
<i>Profitability</i>	-1,1319 *** (0,0532)	-0,5964 *** (0,0619)	*** -0,8933 *** (0,0488)
Continued			
<i>Volatility</i>	0,0970 *** (0,0074)	0,0305 *** (0,0099)	*** 0,0758 *** (0,0070)
<i>Growth Opportunity</i>	-0,0114 *** (0,0031)	-0,0095 *** (0,0034)	*** -0,0111 *** (0,0027)
FOE Dummy	-0,0631 ** (0,0303)	-0,0003 (0,0861)	** -0,0824 ** (0,0370)
Inflation	-0,1008 *** (0,0398)	0,0440 (0,0443)	*** -0,0518 (0,0348)
Real GDP	0,0260 ** (0,0132)	0,0313 ** (0,0145)	** 0,0323 *** (0,0115)
Capital Market Development	0,0423 (0,0688)	0,2574 *** (0,0769)	*** 0,1218 *** (0,0603)
constant	0,0433	3,6799	*** 0,5574 ***



	(0,1772)	(0,5398)	(0,2135)
Number of Observation	2084	2084	2084
R-Squared	0,3068	0,223	0,2853
F-test		2,75 ***	
Breusch and Pagan Lagrangian multiplier test			121,6 ***
Hausman specification test		127,77 ***	

\*, \*\*, \*\*\* denote significance at the 10, 5 and 1 percent levels, respectively, Standard deviation is reported in parentheses

Table 3.4 shows summary statistics of the firm-level data. Internal-external finance variable is one which has highest deviation of data. Growth opportunity and asset maturity are also variables with high deviation. As firms in relatively unstable countries, mean volatility is relatively high (19.227), and mean for firm profitability is relatively low (0.0141). Meanwhile, the mean ratio of debt into equity is also high (0.6702) in all period of study.

Claessens et al. (2001) show data of the median ratio of debt to equity during 1988 – 1996 among countries. Indonesia has 1.951 percent debt-to-equity ratio, which is higher than Malaysia (0.908) and the Philippines (1.129), but lower than Thailand (2.008). According to this study, firms in Korea were the most highly leveraged, followed by Thailand and Indonesia. Furthermore, it is also shown that most companies in East Asian countries ranked below those in European and Latin American countries in their share of long-term debt (Claessens, et al. 2000). In other words, firms in East Asian countries were more exposed to the short-term debts, than firms in both, European and Latin American countries. Pomerleano (1998) shows that the debt-equity ratio in Asian firms, particularly Thai and Korean, were substantially larger than those in Latin American firms.

During period of crisis (1997 – 1998)<sup>9</sup>, debt-equity ratio augmented and reached the peak in 1998. Meanwhile, profitability dropped significantly in the period of crisis, especially in 1998. At that time, exchange rate depreciates sharply from 4,950 IDR/1 USD in December 1997 to 15,000 IDR/1 USD in June 1998. At the same time, to cope with the high currency depreciation, monetary authority in Indonesia or Bank Indonesia hiked interest rate into 70.44 % on August 1998. In such a huge crisis, most firms in Indonesia were technically collapse<sup>10</sup>.

Table 3.5, 3.6, and 3.7 present the baseline of econometric results of the pooled OLS estimates, Fixed-Effect and Random-Effect estimates. The

Ordinary Least Square (OLS) provides the basic multivariate correlation embedded in the data. This technique is criticized since the estimations do not control for unobservable characteristics that could be biasing the estimated coefficients. Fixed-Effects estimation procedure corrects some discrepancies by controlling some of these unobservable characteristics. However, Fixed-Effects (FE) estimation neglects all the cross-sectional variation. And for this issue, Random-Effect (RE) estimates are considered to fulfill the tasks.

For selection procedures, we use three tests, namely F-test for choose whether OLS is better than FE or otherwise, Breusch and Pagan Lagrangian multiplier (LM) test for choosing the option between OLS and RE, and Hausman test to choose whether FE or RE has better estimations.

As shown in the below of Table 3.5 for the estimation of debt-equity ratio, F-test rejects the null hypothesis for OLS, so it prefers to FE estimation. LM test also rejects the null hypothesis, which means that, in this case, RE is, *a priori*, better than OLS. Then, we still have two options, FE and RE. By Hausman test, we are shown that FE is better than RE, since the null hypothesis is rejected. Accordingly, for the estimation of debt-equity ratio, we prefer to use the results of FE estimates in our analysis.

As Table 3.5 shows, in total period of study (1994 – 2004), debt-equity ratio is negatively related to asset maturity. It means that for firms with higher debt, it should have less fixed-asset. In other words, we can say that higher debt-equity ratio means less asset-maturity. It may be that firms listed in Jakarta Stock Exchange (JSX), in general, do not use their debts to finance the investment activities in fixed asset, but it may that firms access debt for financing current inventories for supporting their production activities. It also could mean that the demand of credit from non-tradable sector firms is higher than those of tradable sector.

Table 3.5 describes that debt-equity ratio is negatively related to firm size. Since we employ logarithm of total asset (in constant price) as a proxy for firm size, we can say that firms with higher debts are those with small assets. Or small firms usually have bigger debts. It indicates the firm vulnerability, since small firms should be weaker than big firms in their capacity to repay debts, especially if the great fluctuation is present. Some theories predict that firm size should be increased with debts. Fama and Jensen

<sup>9</sup> Generally, after July 1999 Indonesia can be considered as a country in post crisis-period. It is debatable, but at least it could be argued that since 1999 macro economic conditions were relatively stable, in term of inflation, exchange rate and interest rate. In July 1999, for example, due to the strengthening of economic condition, Bank Indonesia down-graded the interest rate into 13.8 %.

<sup>10</sup> Some studies show the collapse of corporate sector due to crisis in East Asian region, such as Schmukler and Vesperoni (2001), Claessens et al. (2000).

(1983a) argue that larger firms tend to provide more information to lenders than smaller firms. Therefore, larger firms tend to have a higher capacity to borrow than smaller ones. In our case, it is inversely happened where size is negatively related to debts.

There is also a negative relation between debt-equity and firm profitability. This sign shows that firms having high debt are those having small profitability. It also means that unprofitable firms tend to borrow in excessive number. Rajan and Zingales (1995) argue that creditors prefer to give loans to firms with high current cash flow. Long and Malitz (1985) find also the positive relation between profitability and leverage. Wald (1999) even claims that profitability has the largest single effects on debt (assets) ratios.

In Table 3.5, it is also demonstrated that firm volatility, measured by logarithm of the standard deviation of the first difference in earning before interest and tax (EBIT), is positively related to debt-equity ratio. This evidence shows that firms with high volatile returns tend to have high debts. Volatility or business risk is a proxy for the probability of financial

distress and it is generally expected to negatively relate with leverage.

Growth opportunity, which is market-to-book value ratio, is negatively related to debt. Firms with low opportunity to growth have high level of debts. Myers (1997) argues that high growth firms may hold more real options for future investment than low growth firms. Firms with high growth opportunity may not issue debt in the first place and leverage is expected to negatively relate with growth opportunities.

Related to ownership issue, our finding shows that firm with majority foreign ownership is negatively related to debt-equity ratio. This means that firm with foreign ownership parties prefer to use equity rather than debt to finance their operation.

Macro factors, as expected, control the estimates. Real GDP is positively associated with debt-equity ratio. As predicted in many studies, in positive economic growth debt-level will be high. It is also supported by the evidence that capital market development is positively related to debt ratio.

**Table 3.6.** Factors Determining Debt-maturity

	Dependent variables: Debt-maturity					
	<i>Pooled OLS</i>		<i>Fixed-Effect</i>		<i>Random-Effect</i>	
<i>Asset Maturity</i>	0,2422	***	0,0487	*	0,1967	***
	(0,0214)		(0,0276)		(0,0212)	
<i>Size</i>	0,0652	***	0,0427	***	0,0683	***
	(0,0061)		(0,0168)		(0,0065)	
<i>Profitability</i>	0,0522	*	0,1180	***	0,0605	**
	(0,0314)		(0,0431)		(0,0303)	
<i>Volatility</i>	-0,0053		-0,0089		-0,0057	
	(0,0044)		(0,0069)		(0,0043)	
<i>Growth Opportunity</i>	0,0029	*	0,0028		0,0029	*
	(0,0018)		(0,0023)		(0,0017)	
FOE Dummy	-0,0501	***	0,0758		-0,0454	**
	(0,0179)		(0,0599)		(0,0207)	
Inflation	-0,0463	**	-0,0522	*	-0,0475	**
	(0,0235)		(0,0308)		(0,0217)	
Real GDP	-0,0059		-0,0078		-0,0057	
	(0,0078)		(0,0101)		(0,0072)	
Capital Market Development	-0,0919	**	-0,1273	**	-0,0953	***
	(0,0406)		(0,0535)		0,0377	
constant	-1,1219	***	-0,4794		-1,1717	***
	(0,1046)		(0,3757)		(0,1193)	
Number of Observation	2084		2084		2084	
R-Squared	0,1569		0,0508		0,1867	
F-test			1,83	***		
Breusch and Pagan Lagrangian multiplier test					259,89	***
Hausman specification test			77,53	***		

\*, \*\*, \*\*\* denote significance at the 10, 5 and 1 percent levels, respectively, Standard deviation is reported in parentheses

Table 3.6 demonstrates the estimation for debt-maturity or the ratio of long-term debt and total debt. We apply the some procedures for choosing which estimation is a priori better than others. By several tests, we conclude that fixed-effect is better than pooled OLS and Random Effect.

Debt maturity is positively associated with asset maturity. This evidence support the maturity matching hypothesis in which firms try to match their debt based upon asset. Size is also positively related to debt maturity. This means that firms tend to bigger firms tend to be favorable with higher maturity debts or long-term debt. Profitability is also positively related to debt maturity. More profit means higher maturity of debts. Growth opportunity has also positive correlation with debt maturity.

Table 3.6 also shows that firms with majority foreign ownership are negatively related to debt maturity. It means that firms owned by foreign parties tend to use short-term debt rather than long term debt. It may due to that firm with foreign ownership have more profitable units than local firms, so that they can easily access short-term debt for global financial institution.

Table 3.7 shows the estimation for internal and external choice of finance. Based upon tests for choosing the technique estimation, we prefer to use Random Effects. F-test lead us to choose OLS, but LM test show the rejection of null hypothesis which means we are supposed to prefer RE instead of OLS.

In this case, firms with bigger size tend to prefer internal finance rather than external finance. It is also demonstrated by the result of regression that firm with higher profit will choose the internal source of finance. Meanwhile, volatility is negatively related to internal-external choice. Thus, it means that firms with more volatile returns should choose external finance. Inflation and capital market development have positive relation with internal finance.

The findings in Table 3.7 for internal or external financing choice are basically supportive to the findings in Table 3.5 which shows the result of estimates for debt-equity choice. In Table 3.5 it is shown that size and profitability are negatively related to debt-equity choice. And in Table 3.6 these variables are positively related to internal choice. If in Table 3.5, big firms and profitable firms tend to use equity, the Table 3.7 supports the result in which they seem to be favourable with internal finance.

**Table 3.7.** Factors Determining Internal and External Choice of Finance

	Dependent variables: Internal-External finance				
	<i>Pooled OLS</i>		<i>Fixed-Effect</i>		
<i>Asset Maturity</i>	0,1889 (0,2824)		0,9601 (0,5591)	*	0,1889 (0,2824)
<i>Size</i>	0,2560 (0,0801)	***	1,4941 (0,3408)	***	0,2560 (0,0801)
<i>Profitability</i>	3,5063 (0,4133)	***	2,8348 (0,8726)	***	3,5063 (0,4133)
<i>Volatility</i>	-0,1130 (0,0579)	**	-0,0165 (0,1393)		-0,1130 (0,0579)
<i>Growth Opportunity</i>	-0,0197 (0,0238)		-0,0053 (0,0474)		-0,0197 (0,0238)
FOE Dummy	0,1055 (0,2358)		-0,4149 (1,2144)		0,1055 (0,2358)
Inflation	0,7050 (0,3094)	**	0,5820 (0,6253)		0,7050 (0,3094)
Real GDP	0,0457 (0,1026)		0,2248 (0,2040)		0,0457 (0,1026)
Continued					
Capital Market Development	0,9042 (0,5352)	*	0,6765 (1,0851)		0,9042 (0,5352)
Constant	-3,9082 (1,3778)	***	-33,9306 (7,6147)	***	-3,9082 (1,3778)
Number of Observation	2084		2084		2084
R-Squared	0.0464		0.0450		0.0645
F-test			0.47		
Breusch and Pagan LM test					26.72
Hausman specification test					***

\*, \*\*, \*\*\* denote significance at the 10, 5 and 1 percent levels, respectively, Standard deviation is reported in parentheses

#### 4.2. Behaviour in pre- and post-crisis period

In this section, we are concerned with the change of behaviour in pre- and post-crisis period. We also focus on the firm-specific factors for gaining better results.

In pre-crisis period, debt-equity ratio is positively related to asset maturity, which means that more debt is more fixed-asset. Unfortunately in post-crisis period, the relation is not significant. Then we are not able to make some comparisons for the issue of the relation of debt equity ratio and asset maturity. However we can draw some comparison analysts between pre- and post-crisis period on the variables of size and profitability.

In pre-crisis period, debt-equity ratio is

positively related to size. But in post-crisis period, debt-equity ratio is negatively related to size. Both estimations are significant in 1 percent confidence level. It indicates that in post-crisis period, behaviour of financing policies of listed firms in Indonesia is not better than in pre-crisis period. In pre-crisis period, firms with higher debt are those with bigger size. But in post-crisis period, inversely, firms with higher debts are smaller firms.

The relation of debt ratio and profitability is consistent in before and after crisis. Firms with higher debts are those having small profitability, or higher debts means smaller profitability. This evidence is not change because of the eruption of crisis in 1997. In post-crisis period, firms do not change the behaviour of accessing debts.

**Table 3.8.** Result for Debt-Equity Ratio

	<i>Dependent variable: Debt-equity ratio</i>					
	Total Period		Pre-crisis		Post-crisis	
<i>Asset Maturity</i>	-0,0546	*	0,0373	***	-0,0209	
	(0,0336)		(0,0123)		(0,0742)	
<i>Size</i>	-0,0628	***	0,0473	***	-0,0536	***
	(0,0111)		(0,0094)		(0,0162)	
<i>Profitability</i>	-0,8921	***	-0,5600	***	-0,7987	***
	(0,0475)		(0,0977)		(0,0609)	
<i>Volatility</i>	0,0777	***	-0,0025		0,0767	***
	(0,0067)		(0,0054)		(0,0087)	
<i>Growth Opportunity</i>	-0,0114	***	-0,0067		-0,0108	***
	(0,0027)		(0,0065)		(0,0029)	
Constant	0,6499	***	-0,5088	***	0,4913	
	(0,2124)		(0,1911)		(0,3125)	
Number of Obs	2084		334		1348	
R-Squared	0.2813		0.1596		0.2917	

**Table 3.9.** Result for Debt-Maturity

	<i>Dependent variable: Debt-maturity</i>					
	Total Period		Pre-crisis		Post-crisis	
<i>Asset maturity</i>	0,2022	***	0,1035	***	0,2979	***
	(0,0212)		(0,0314)		(0,0328)	
<i>Size</i>	0,0715	***	0,1085	***	0,0544	***
	(0,0064)		(0,0156)		(0,0073)	
<i>Profitability</i>	0,0684	**	-0,1736		0,1139	***
	(0,0295)		(0,1667)		(0,0332)	
<i>Volatility</i>	-0,0103	***	0,0108		-0,0114	***
	(0,0041)		(0,0108)		(0,0045)	
<i>Growth Opportunity</i>	0,0029	*	-0,0170		0,0026	
	(0,0017)		(0,0130)		(0,0016)	
Constant	-1,1972	***	-2,3694	***	-0,8228	***
	(0,1186)		(0,2949)		(0,1286)	
Number of Obs	2084		334		1348	
R-Squared	0.1814		0.2944		0.1757	

In debt-maturity measurement, as shown by Table 3.9, we have not significant changes in pre- and post-crisis period. On the relation between debt-maturity and asset maturity the coefficient is increasing in post-crisis period, if we compare with the before-crisis period. It means that firms are more

matching their debt to their asset in post-crisis period than in before crisis period. Another important remark is that firm volatility is negatively and significantly related to debt-maturity in post-crisis period. It means that more volatile firms should have short maturity debts.

**Table 3.10.** Result for Internal External Financing Choice

<i>Dependent variable: Internal and External choice</i>							
	<i>Total Period</i>		<i>Pre-crisis</i>		<i>Post-crisis</i>		
<i>Asset maturity</i>	0,1399		-0,1677	***	0,5431		
	(0,2818)		(0,0446)		(0,5332)		
<i>Size</i>	0,2287	***	-0,0960	***	0,4148	***	
	(0,0790)		(0,0388)		(0,1215)		
<i>Profitability</i>	3,3554	***	2,7309	***	4,3474	***	
	(0,4002)		(0,3911)		(0,6201)		
<i>Volatility</i>	-0,0722		0,0166		-0,1594	**	
	(0,0554)		(0,0209)		(0,0826)		
<i>Growth Opportunity</i>	-0,0208		-0,0282		-0,0177		
	(0,0238)		(0,0248)		(0,0314)		
Constant	-3,6882	***	2,2531	***	-6,4452	***	
	(1,3662)		(0,8073)		(2,0216)		
Number of Obs	2084		334		1348		
R-Squared	0.0612		0.2007		0.0613		

By Table 3.10 we can see that internal finance is negatively associated with firm size in pre-crisis period, but it is positively related to size in post-crisis period. Before crisis, firms using internal finance are those whose small size, otherwise larger firms tend to access external finance. In post-crisis period, internal finance is positively related to size. It means that larger firms prefer to use their internal finance rather than debt.

## 5. Discussion and Conclusion

The objective of this chapter is to examine factors determining the financing behavior of the listed firms in Indonesia during the period 1994 – 2004. Furthermore, our interest is also to show the change of the financing policies in Indonesia due to financing crisis which started in the mid of 1997.

Our estimations are based upon three dependent variables, which are debt-equity ratio, debt-maturity ratio and internal-external choice of finance. First variable measure whether firms prefer debt rather than equity in their financing. Second variable gives an explanation of whether firms are favourable in the long-term rather than short-term debts in their debt composition, and the third variable deals with the question of whether firms prefer to use internal rather than external finance in their activities.

As described in previous section, in total period of study (1994 – 2004), listed firms in Indonesia have a negative relation between debt-equity ratio and profitability. This is an important leading indicator of firm fragility since the “gearing effect” is present. Gearing ratio is basically a ratio of total debt to total equity or capital. This ratio gives an indication of how easily a firm can repay debts from selling assets, since total capital (or shareholders fund) measures net assets (Pike and Neale, 1999). Firm with high debt-equity ratio will have a higher probability not only of failing to make a return to equity holders but also failing to meet interest cost obligations. In our case, high debt-equity ratio with low profitability would

raise the probability to be insolvent. In macro sense, the high probability of firm insolvency would lead economy to the financial fragility which could easily be ended in financial crisis.

However, there is an indication that listed companies in Indonesia were trying to match their debts structure with their structure of assets. Or we can say that there is a maturity-matching behaviour among listed companies in Indonesia. There is a strategic action of listed companies in Indonesia to match their debt to their asset. But this strategic action could be taken by big companies. The small firm tends to be more exposed to the short term debt rather than big one. This evidence is supported by the finding that firm size is related positively to debt-maturity.

It is also the case for the firm with bad profitability. They are more exposed to the short term debt than firm with higher profitability. It is supported by the finding that profitability is negatively related to debt-maturity. There is another interesting evidence that firm with foreign ownership majority prefer to use short-term debt rather than long-term debt. It may due to their good performance and their access to the global financial market.

Measured by debt-equity ratio, the behaviour of financing policies of listed firms in Indonesia in post-crisis period is not better than in pre-crisis period. In pre-crisis period, firms with higher debt are those with bigger size. But in post-crisis period, inversely, firms with higher debts are smaller firms. It could be an indication that debt level was not supported by enough collateral. If it is the case, the behaviour of financing policies of the listed companies in Indonesia is still risky and vulnerable with external shocks. Another indication of the vulnerability in post-crisis period can be seen in the evidence that volatility is associated with short-maturity debts. However, the question of whether small firms in Indonesia are more vulnerable to external shock should be investigated by further research.

This chapter is success to identify factors

determining financing structure of the listed firms in Indonesia as well as to identify the impact of crisis on the behaviour by comparing the behaviour in before and after crisis period. However, it still unanswerable questions such as why firm with majority foreign ownership is enjoyable with short-term debt. Or again the question of whether industrial sector differences should be important factor influencing firm financing behaviour. These questions should be discussed in the future research for gaining better understanding of corporate finance behaviour in Indonesia.

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## CAPITAL STRUCTURE AND CORPORATE GOVERNANCE: THE FRENCH CASE

*Esther Jeffers\**, *Dominique Plihon\*\**

### Abstract

The world economy has undergone major changes during the last twenty years. Financial markets have grown spectacularly on the international level. In particular, stock markets rose substantially in the 1990s. At the same time, the combined process of deregulation and financial innovations transformed the internationalization of financial activities into financial globalization, which witnessed a considerable strengthening of both the impact and freedom of action of the main players. France did not remain unaffected by this evolution, much the contrary. This was all the more impressive given the historical weakness of the country's financial markets. Many studies have been devoted to the growth of financial markets and many others to corporate governance, but the influence of the capital structure and the forms of governance on corporate strategies have rarely been empirically evaluated in the literature, due to the scarcity of relevant data. This paper aims at understanding (I) how the capital structure of French corporations has changed and, through an empirical study, (II) how this change may have impacted their strategy.

**Keywords:** corporate governance, capital structure, France

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### 1. The new geography of capital of French corporation

#### 1.1 Radical reforms implemented by successive French governments

On a world level, finance has been profoundly transformed over the last twenty years. What characterizes these changes in France is that the government, not the private sector, has been the driving force behind them. In addition, the French government has been instrumental in changing the corporate financial environment.

Three major sets of factors led to these important developments. First of all, world deregulation has led to an unprecedented expansion of financial markets by eliminating the obstacles to the circulation of financial capital. In France, the government has carried out a deliberate policy of market deregulation, whose purpose has been to encourage opening up the market to various operators and products.

Secondly, the authorities dearly needed to expand the financial market. For example, they needed to find a means to finance growing budget deficits in the main industrialized countries. Beginning in the 1980s this led to the issuing of government bonds with little risk and high returns, and contributed to the dynamism of financial markets.

In the context of globalization, continental European governments also sought to finance restructuring and expansion by turning to financial markets and by attracting foreign investors. The extensive waves of privatization programs in the 1980s and 1990s played a fundamental role in the U.S. institutional investors' growing share of the capital of large European and particularly French companies (Coriat, 2006).<sup>11</sup>

Thirdly, for investors, the long period of rise in the value of financial assets in the 1990s had a stimulating effect on investments in financial products. And this effect has been amplified recently by the generally favorable evolution of the relevant taxation. Competition between the different financial markets has produced similarly low rates of taxation everywhere. At the same time, the increasing uncertainty of how retirement pensions will be financed in the future has encouraged employees to increase their own savings plans. Finally, the growth

<sup>11</sup> In France an initial wave of privatizations was carried out in 1986—Saint Gobain, Banque Paribas, Société Générale, among others. A second wave began in 1992 with Total, followed by Rhone Poulenc and the Banque Nationale de Paris in 1993, Renault in 1994, and Péchiney in 1995. Between 1997 and 2000, the French government also sold to institutional investors part of its share in companies such as France Télécom, Thomson, Air France, and Crédit Lyonnais.

of mutual funds is the expression of the development of a stock market culture among small investors, even in countries where financial investing had been limited in the past. This is the case in France, where one out of three households today holds financial assets, comprising more than half of all household savings, against only one third of all such savings in the 1970s. While privatization of traditional infrastructures was strategically used by governments to attract foreign investors and increase the liquidity of national capital markets, it has also been a means of encouraging middle class households to shift their savings in the direction of the stock market.

### **1.2 The shift from capitalism dominated by the public sector to shareholder capitalism**

The growth of institutional investors has led to a major change as to who holds corporate capital. In countries such as France or Germany, large blocks of corporate shares were traditionally held by friendly companies (“hard-core” shareholders or banks), who controlled major companies more or less directly. These controlling blocks have progressively been replaced by independent institutional shareholders. In the 1990s, European firms relied less on bank credit and more on equity markets to raise capital. As a result, domestic ownership of these companies and cross-shareholding among firms declined.<sup>12</sup> Simultaneously, ownership gradually became more dispersed and more international, with institutional investors such as U.S. pension funds and mutual funds coming to the fore. The importance of these investors varies considerably according to their weight in their own countries and also according to the local conditions in the receiving country. For instance, the absence of pension funds in France helps explain the relatively greater weight of foreign investors in French corporations. Depending on the source, the proportion of equity these players are said to hold in companies listed on the French market varies between 38% and 50% and is also thought to be quite significant in unlisted companies in certain growth sectors.<sup>13</sup> In some countries recently introduced legislation has accentuated this phenomenon. This has been the case for example in Germany, where the Bundestag has reduced capital

<sup>12</sup> As share buyback programs have become increasingly widespread, today equity markets are no longer providing firms with capital on a net basis.

<sup>13</sup> The weight of non-residents varies considerably from one company to another and from one business sector to another. For example, non-residents own more than 50% of basic industrial and natural resource companies, including companies such as Air Liquide, Bouygues, Lafarge, Saint Gobain, or Total. The financial company sector (AXA, AGF, BNP Paribas, Société Générale...) is the second most preferred area for foreign investors, who own nearly 45% of it. U.S. funds comprise a large portion of these non-residents.

gains taxes for banks and corporations selling their stock holdings (Lane, 2003).

In many countries, corporate capital has gradually passed from the hands of a reduced number of strategic shareholders into the hands of many independent institutional stockholders, each of them holding only a limited number of shares. Cross-shareholdings have been disappearing and dual class shares eliminated. A large number of continental European countries have also changed their corporate law and financial market regulations in recent years. National laws on corporate governance are being revised in similar directions in many countries to make investment in national firms more attractive to international investors and hedge funds.

U.S. mutual and pension funds are the most prominent among the varied categories of institutional investors. Although they are products of specific processes and obey different sets of rules, these players are in many ways a homogenous group because their interests and their demands often coincide on key issues. Clearly a large number of recent European economic reforms and transformations, particularly in France, have been made with an eye on U.S. mutual and pension funds.

### **1.3 The increasing role of foreign institutional investors in France**

Institutional investors draw their power from the colossal mass of financial assets they manage—over \$55 trillion in 2005, according to OECD, more than the combined GDP of all the industrial member countries of the OECD! Adding to their weight was the extremely rapid increase of these assets—244% from 1992 to 2005. Their geographical distribution is extremely unbalanced—almost 55% are in the United States, whereas only 10% are in Japan, 8% in the United Kingdom, 5% in France and 4% in Germany.

During this same period, the percentage of the shares of listed corporations held by institutional investors increased considerably (Jeffers and Plihon, 2002), both in the United States and in France. In this field, France has the distinction of having the largest percentage of shares of listed firms held by non residents. According to a recent study of the Banque de France (2007), non residents held 46.4% of the capital of the CAC 40 companies in December 2006. The share held by non residents increased by thirteen points from 1997 to 2006.

At the same time, the percentage of stock held by this category is clearly greater for the corporations part of the CAC 40 than for other firms. This confirms observations made previously (Jeffers and Moyé, 2004), and may be partially explained by the importance of liquidity for non resident institutional investors when making investments and the increasingly indexed and delegated investment strategies they have adopted.

A study of the percentages of stock held in the CAC 40 companies at the end of 2002 by non



residents showed sizeable variations over the previous two years according to the business sector. Non residents preferred firms in basic industry as well as financial companies. They also increased their presence in the sector of general industry from 24% to 37.8%. And, despite significant withdrawals from the technology sector after the NASDAQ bubble burst, they continued to hold 44.1% of the stock in that field (Banque de France, 2004).

One explanation as to why these investors turned to the French market are the returns from the largest French companies. Along with U.S. firms, they were the most profitable for stockholders if the Total Shareholder Return standard (new share price + dividend paid out / initial stock price) is used, according to a study of the Boston Consulting Group in 2000.

All the assessments show that in many industrialized countries, such as France, the presence of institutional investors is sizeable and growing. Clearly, it has significantly modified the capital structure of the largest companies, and the effect of this change on their functioning should be examined.

#### **1.4 The debate with respect to changes in French forms of governance: a convergence towards the Anglo-Saxon model?**

What is the significance of these changes? Are they transitory or lasting? Do they impact corporate strategy? And if so, how? Do they demonstrate the failure of the continental European model of corporate governance and the superiority of the Anglo-Saxon model? Do they mean the differences between national systems will be eliminated in favor of one unified system? One important question that arises is whether one particular national corporate governance system is better than another, and whether national governance systems will converge. If convergence does occur, does that mean that systemic differences will disappear, leaving only one model, or are we witnessing a dual convergence leading to a hybrid model, specific to each system according to the dependency path?

Given the recent changes in French capitalism, in particular the growing holdings of Anglo-Saxon investors in the stock of French corporations, it can be tempting to affirm that management styles are currently conforming to the Anglo-Saxon system. This question has given rise to contradictory analyses. Some authors feel that the national models in continental Europe will end up keeping their specificity; for example, this is the analysis made by Roe (1990 and 1994) and Hall and Soskice (2001). On the other hand, other authors have concluded there is an inexorable convergence towards a dominant model imported from the Anglo-Saxon countries (Berger and Dore, 1991; and in France: Morin, 1998 and 2000). More recently, a third group of authors has come to the conclusion that a new hybrid model of corporate

governance, a combination of the shareholder and the stakeholder models, has emerged (Plihon, Ponsard and Zarlowski, 2005 and Jeffers, 2005).

## **2. An empirical study of the corporate governance of French firms**

Our goal in this section is to establish a relationship between capital structure and governance and, more specifically, to try to link corporate strategies and governance with clearly distinct patterns of capital structure.

### **2.1 Data sets used**

We used the following data sets (Table 1) to carry out this project: LIFI,<sup>14</sup> EAE,<sup>15</sup> LEREPS,<sup>16</sup> and VIGEO.<sup>17</sup> LEREPS provided us with information regarding capital structure, percentage of share ownership, categories of investors (banks, pension funds, investment funds, and so on), and their nationality; Vigeo with information regarding corporate governance practice; LIFI and EAE with information about financial relations and accounting data. These data sets allowed us to study shareholder concentration, investor categories and nationalities. We then related them to different elements of corporate governance, such as human resource management, attention given to shareholders, to civil society organizations, and to other stakeholders.

Our study sample consists of the firms publicly traded on the Paris stock exchange and belonging to the SBF 120 index (see Table 1).

Pairing different data sets allowed us to build a comprehensive database, composed of 14,883 subsidiaries representing 90 groups. Working on a database composed of subsidiaries considerably enhanced the quality of our results.

<sup>14</sup> Enquête sur les liaisons financières entre sociétés (LIFI) – is a permanent mechanism run by the National Institute of Statistics (INSEE) to observe French firms of the private sector. These firms can belong to any sector of activity as long as their portfolio is above 1.2 billion euros, their sales figures superior to 60 million euros, or the number of their employees over 500.

<sup>15</sup> (EAE) is an annual survey conducted each year with a sample of firms belonging to:  
- the manufacturing industry;  
- the food processing industry;  
- construction and transportation;  
- trade and other services

Firms part of the sample have more than 20 employees or more than 5 million euros in sales.

<sup>16</sup> LEREPS is a research center in economics of the University of Toulouse.

<sup>17</sup> VIGEO is a French social rating agency.

**Table 1.** Summary of data sets used in this study

Data Sets	Variables Types	Years Available	Computation Level
LEREPS	Capital structure Investors Nationality of investors	2002	SBF 120 Firms
VIGEO	Governance	1999-2000-2001	SBF 120 Firms
LIFI	Financial relationships	2000-2001	see footnote 4
EAE	Accounting data	1999- 2002	see footnote 5

## 2.2 Methodology

After the exclusion of firms for which necessary information was lacking, we built a typology of the remaining 14,883 firms (subsidiaries), grouping similar firms together and constituting groups as different from each other as possible.

In order to build such a typology of the groups, we proceeded as follows:

- We applied a Principal Component Analysis (PCA) to the capital structure database in order to determine the factors that most differentiated the various firms. PCA makes possible the compression of data by reducing the number of dimensions without much loss of information. We proceeded with PCA, keeping only the first three factors. The result preserved 69% of the total information, a good representation of all the variables.

- We put the firms together in homogenous groups through dynamic clouds of points and applied ascending hierarchical classification to compute the largest possible number of segments and obtain the most meaningful organization of our data base. The Ascending Hierarchical Classification consists of carrying out progressive grouping of individual values in accordance with their degrees of similarity to obtain a single class that groups them all. Once this calculation has been made, the individual values are divided up into various classes.

## 2.3 Three major sets of discriminating factors

Table 2 presents the variables used in the PCA and the correlation between the variables and the first three factors. We can visualize the projection of variables on the multidimensional space F1-F3 in Figure 2.

**Table2.** Percentage of the information available on each of the PCA axes

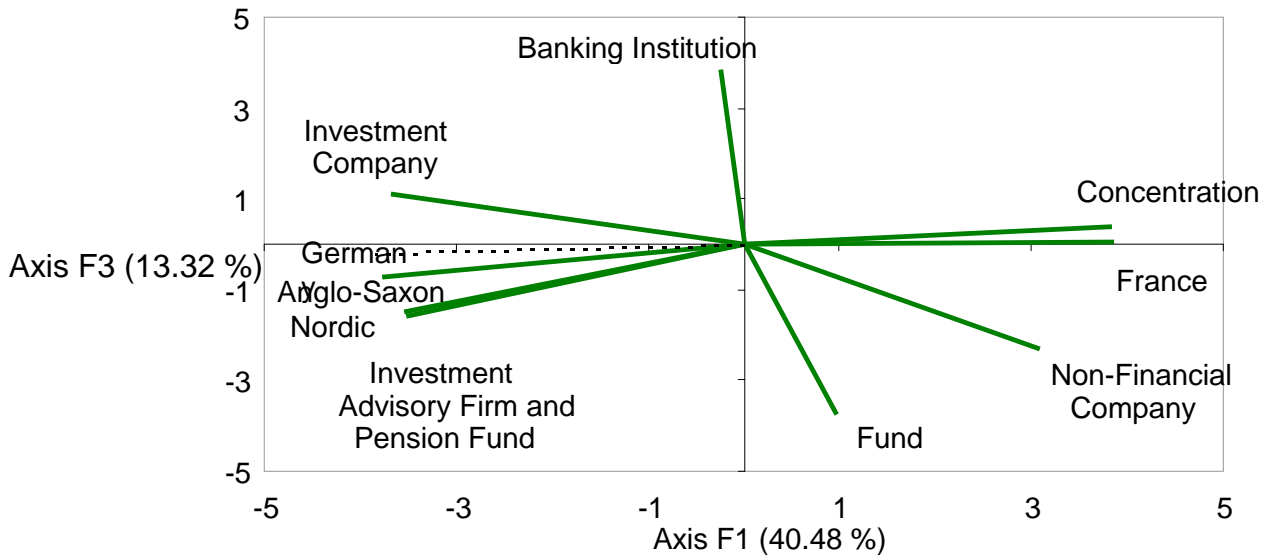
	F1	F2	F3	Total Information
Concentration	70%	0%	1%	70%
Non-Financial Company	53%	2%	29%	84%
Banking Institution	0%	36%	54%	91%
Investment Company	27%	16%	2%	46%
Fund*	1%	66%	15%	82%
Investment Advisory Firm** and Pension Fund	54%	8%	10%	71%
France	76%	3%	0%	79%
Anglo-Saxon	51%	0%	2%	53%
Nordic	32%	4%	7%	43%
Germany	8%	0%	0%	9%
<b>Total Information</b>	<b>40%</b>	<b>15%</b>	<b>13%</b>	<b>69%</b>

\* Funds managed by mutual funds

\*\*Mutual funds

As seen in Table 2, F1 contains most information (40%). It is characterized by high concentration of capital, the presence of non-financial companies, as well as the presence of pension funds. Investors are of French nationality as well as Anglo-saxon. F2 shows mainly mutual funds, then banks as main investors. As for F3, investors are primarily banks and non-financial institutions. Overall, F1-F2-F3 provides us with 69% of information available.

To take an example, we will comment on Figure 1, which is a projection of the variables on the factorial axis F1-F3. The main characteristics of axis F1 between 0.0 and 1.0 are the high concentration of capital, the presence of non-financial firms and French nationality. Between 0.0 and -1.0, the axis has three characteristics—the dispersion of shareholders, the presence of investment funds and pension funds, as well as that of Anglo-Saxons.



**Figure 1.** Projection of the variables on the factorial axis F1-F3

Axis F3 represents banks. Banking institutions play a relatively significant role in the capital structure of the firms found in the positive portion of axis F3. As can be seen, banks and mutual funds are two different ways to hold capital in French firms. This opposition between them echoes the traditional opposition of bank-based and market-based financial systems.

How should we interpret these results?

#### 2.4 .Four groups of firms

Information generated by the three axes of the PCA allows us to present the following typology. Four groups of firms are clearly delineated. Two of them are unmistakably distinct (Groups 1 and 3) according to the level of capital concentration, the main

categories, and the nationality of the shareholders (see table 3). As for the two other groups (2 and 4), differences in capital structures appear, but few conclusions can be drawn on other questions because of a large heterogeneity in their practices.

Group 1 is characterized by capital dispersion; the main shareholders are pension, investment, and other kinds of funds, many of which are Anglo-Saxon. Subsequently Group 1 firms will be referred to as “Anglo-Saxon.” Strikingly, they correlate positively with giving significant weight to corporate governance principles, with implementing these principles, and with obtaining results based on them. Two good examples of this kind of firm are Total-Elf (energy sector) and Vivendi (new technology of communication and information), as seen in Table 4.

**Table 3.** Correlation between typological groups and capital structure

	Group 1	Group 2	Group 3	Group 4
Capital Concentration				
Concentration	-64%	3%	56%	32%
Institutional Shareholders				
Non-Financial Company	- 29%	- 25%	88%	- 19%
Banking Institution	- 1%	- 21%	- 38%	81%
Investment Advisory Firm and Pension Fund	76%	- 35%	- 42%	- 20%
Investment Company	22%	24%	- 41%	- 25%
Fund	19%	- 44%	4%	32%
Nationality of Shareholders				
France	- 57%	- 16%	65%	39%
Anglo-Saxon	63%	- 20%	- 39%	- 25%
Nordic	47%	- 20%	- 28%	- 11%
Germany	18%	10%	- 24%	- 16%

At the opposite end of the spectrum, Group 3 is denoted by a high concentration of capital and the shareholders are mostly non-financial firms. A majority of these shareholders are French. Subsequently referred to as “French,” Group 3 firms

correlate negatively with giving weight to corporate governance issues and specifically with paying attention to their shareholders. Examples of this type of firm are Casino (supermarkets), which is owned by a family, and Crédit Agricole (banking sector), which

belongs to the mutual sector. It is striking to see that St Gobain, one of the oldest French companies, has

adhered to the “Anglo-Saxon” style of corporate governance.

**Table 4.** Main French firms belonging to the four typological groups

GROUP 1	GROUP 2	GROUP 3	GROUP 4
25 heads of groups 6237 companies	47 heads of groups 4839 companies	9 heads of groups 2320 companies	9 heads of groups 1497 companies
Accor Aventis BNP – Paribas Essilor Lafarge Saint-Gobain Thomson Total Elf Vivendi	AGF Bouygues Carrefour Danone Eurotunnel Michelin Sanofi Syntelabo Société Générale Valeo	Casino Guichard Crédit Agricole SA Dassault Systèmes Euro Disney TFI Thales	CNP Assurances Ciments Français Crédit Lyonnais Natexis Banques Pop Pinault Printemps

In an effort to further refine our findings, we conducted an analysis based on the different typological groups identified above and we linked the typological groups to variables of governance practice.

### 2.5 The relationship between capital structure and governance strategies

We first used the data set provided by Vigeo on corporate governance. It gave information on:

- Shareholders, on three levels: first, the declared goals (referred to as leadership in Table 4), second, their implementation (deployment), and finally, the obtained results (results).

- Human resources: the quality of human resources in each firm, compared to that of its respective sector.

- Civil society organizations: the quality of each firm’s relation with CSOs was compared to that of its respective sector.

- Other stakeholders: three types—clients and suppliers, social environment, and shareholders.

We related the preceding capital governance criteria with our four typological groups. We found a similar contrast in the analysis of the typological groups and corporate governance practices (see Table 5)..

**Table 5.** Correlation between the typological groups and governance practice

	Group 1	Group 2	Group 3	Group 4
Shareholders:				
• Leadership	28%	13%	- 63%	9%
• Deployment	38%	7%	- 66%	5%
• Results	27%	11%	- 65%	18%
Firm Human Resources	29%	12%	- 61%	6%
Sector Human Resources	30%	9%	- 55%	4%
Firm Civil Society Organizations	30%	9%	-62%	11%
Sector Civil Society Organizations	30%	6%	-60%	14%
Partnership:				
• Clients and Suppliers	21%	10%	-56%	18%
• Social environment	15%	24%	-50%	- 2%
• Shareholders	34%	1%	- 58%	12%

There are clearly two distinct, diametrically opposite, typological groups—groups 1 and 3. They are characterized by totally different corporate governance policies, reflecting their contrasting capital structures as seen previously. Concerning the two other groups—groups 2 and 4—it is not possible to draw clear-cut conclusions on their corporate governance policies (see Table 6) although

differences do exist in terms of the structure of their capital. Considering the period our empirical work is based on—the first years of the twenty-first century—the firms belonging to these two groups seem to be in an intermediary position, which could be interpreted as a transition from their initial “French” style to a new one. These apparent shifts in the corporate

landscape should be a fascinating object of further study.

To summarize, in France it is possible to establish a correlation between the capital structure of companies and their practice in terms of governance.

**Table 6.** Summary of the typological groups' characteristics

Group 1 6237 firms 25 heads of groups	Group 2 4839 firms 47 heads of groups	Group 3 2320 firms 9 heads of groups	Group 4 1497 firms 9 heads of groups
<b>Capital Structure</b>			
Dispersion of shareholders	Non significative	Concentration of shareholders	Concentration of shareholders
- Investment advisory firms - Pension funds	Investment company	Non-financial company	Banking institution
Anglo-Saxon	Pre-dominantly German	French	French
<b>Governance</b>			
Compliance with shareholder governance principles	No dominant behavior with respect to governance	No compliance with shareholder governance principles	No dominant behavior with respect to governance

It should be noted that besides the two contrasting models, French and Anglo-saxon, detected by our study, it is possible to discern more intermediate models whose practice of corporate governance seems less clearly defined.

## Conclusion

The ways in which capital is held have greatly evolved these past years in the countries of continental Europe—particularly in France where almost all industrial and financial companies have been privatized within the past two decades. This has led to the spectacular increase in non resident institutional investors' holdings of the capital of the main French companies with evidently important consequences for their functioning.

Traditionally, in the literature, two points of view have opposed each other concerning the spread of corporate governance models. One insists on their convergence, the other refutes it. These two positions, attractive in theory, do not have much to do with reality. When companies are examined individually, as we tried to do it in this study of French firms, a great diversity of situations is found. This is probably also the case for other European countries. Some companies, whose capital is largely detained by Anglo-Saxon investors, apply corporate governance practices from the shareholder model, whereas companies less open to international investors apply more local corporate governance practices more related to the history and institutions of the country. Our study suggests that, in a global economy, the nationality and the nature of the shareholders count more than the localization of the company. We believe however that domestic institutions and the political and judicial frameworks also have often significant influence on the results and the practices of firms.

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## THE EFFICIENCY OF THE ITALIAN STOCK EXCHANGE: MARKET REACTION FOLLOWING CHANGES IN RECOMMENDATIONS

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### Abstract

The main objective of this paper is to examine the market reaction to the recommendation changes issued by financial analysts. We study the peculiar case of Italy where analysts have to send their reports to the Stock Exchange Commission and the Stock Exchange the same day they give it to their clients. Reports are available on the Stock Exchange website. Our dataset includes about 5,200 reports issued on the 117 IPO firms that went public on the Italian Stock market between 1<sup>st</sup> January 1998 and 31<sup>st</sup> December 2003. We calculate abnormal returns and abnormal volumes associated with the dissemination of the reports and perform two short-term event studies: the first associated with the “report date”, i.e. the date in which the analyst gives the report to private clients; the second one with regard to the “public access date”, i.e. when the report is freely and publicly available on the Stock Exchange website. At the report date we find average abnormal returns of 1.01% for upgrades, and of -0.92% for downgrades, both statistically significant. We also find abnormal returns the day before the report date. This can be the effect of other news affecting prices, or the violation of Italian regulation. The impact of recommendations changes is also analyzed in a three days event window [-1; +1], a pre-event [-15; -2] and a post-event window [+2; +15]. While at the report date the average abnormal return is slightly larger for upgrades, in the three event window downgrades have an higher impact (CAR= -2.06%) than upgrades (CAR= 1.89%), coherent with the previous literature. While there is no effect in the pre-event window, we find in the post-event window a CAR of 1.16% for upgrades and of -1.29% for downgrades, both statistically significant, even if daily average abnormal returns are not statistically significant. We find abnormal volumes both in the three-days event window and some days before the report date, both for upgrades and downgrades. The event study related to the public access date show very different results. We do not find statistically significant average abnormal returns around this date, indicating that the market efficiently does not react to the mere publication of the report on the Stock Exchange website, since prices already included the effect of the recommendation change at the report date, i.e. when the new information was given to analyst's private clients. It remains to be investigated if the abnormal returns before the report date are due to the effect of news different from the recommendation change or if they show a violation of the Italian regulation.

**Keywords:** analysts, recommendation changes, market efficiency, short-term event study

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### 1. Introduction

The degree of efficiency in a stock market can be assessed in different ways. In the finance literature, event study analysis is one of the most used techniques since it allows to measure the market reaction following a particular event.

In this paper we investigate market efficiency studying the reaction to changes in analysts' recommendations. If there is an upgrade in the rating assigned to a firm we should expect positive market reactions both in terms of abnormal returns and extra-volumes, while in case of downgrade, while we could expect abnormal volumes, we should also record negative extra-returns.

Brokerage analysts are professionals that give recommendations to investors, thus reducing the asymmetric information existing between the average investor and the management of listed companies.

There is a huge amount of studies in the literature focusing on the role of these professionals, but they almost totally are on the US case, with few exceptions regarding cross-country analysis worldwide or regarding European countries. One example is Jegadeesh and Kim (2003) that however found that Italy seems to be a particular case, since they do not find any reaction to recommendation changes.

In this paper, we claim that the evidence regarding Italy is basically wrong, since it is based on commercial databases like I/B/E/S that however are biased.

One of the main contribution of this paper is that we have constructed our own database that includes about 5,200 reports issued on 117 Initial Public Offering (IPOs from now on) that went public between the 1<sup>st</sup> January 1998 and the 31<sup>st</sup> December 2003.

The Italian case is peculiar since its regulatory system imposes to analysts to transmit the reports to the Italian Securities and Exchange Commission (the Consob) and deposit them to Borsa Italiana S.p.A., the managing company of the Italian Stock Exchange, on the same day in which the reports are available to their private clients.

To evaluate the market reaction we calculate both extra-returns and abnormal volumes deriving from recommendation changes.

We perform two separate short term event studies taking using two different event dates: the first is the moment in which the report is given to the private clients of the analyst, while the second refers to the moment in which the report is published in the Stock Exchange website.

We verify the efficient market hypothesis for which investors should react in correspondence of the report date, but not after the publication date since the information has already been incorporated in the prices through the transactions of the analyst' private clients. If no value is included in the report, then the research activity of the analyst is worthless, and investors should not adjust their portfolios in response to that. If, instead the report has some value, then we should observe abnormal returns and abnormal volumes.

If the market is informationally efficient, instead, these abnormal volumes and abnormal returns should last for a very short period of time and then disappear. When the report becomes publicly available, the informational content should be already incorporated into the market, therefore we should not observe any abnormal volume or return.

During IPOs the problem of asymmetric information between the management of the companies going public and investors is highest, since most of the IPO-firms are relatively unknown by

investors. Since the cost of gathering information in these cases can be very high for the average investor, then the work of analysts is highly valuable.

The results obtained show an average abnormal return of 1.01% for upgrades and of -0.92% for downgrades. We find a market reaction also the day before the report date. It is possible that price sensitive information are disseminated before the recommendation change, however, an alternative explanation can be proposed: analysts give the information to their private clients before the report date in which they should transmit the report to the Consob and deposit it to the Stock Exchange. This would signify a violation of the regulation in force.

The impact of a recommendation change is also calculated using Cumulative Abnormal Returns (CAR) on different periods. The first one includes the three days around the event date [-1 ; +1], the second time window instead includes the fourteen days preceding this date [-15 ; -2], while the third one the fourteen days following the event date [+2; +15]. While at the report date the average abnormal returns are greater for upgrades than for downgrades, the CAR on the three days window around the event date is 1.89% for upgrades and -2.06% for downgrades, in line with previous results found in literature.

We do not find any significant effect in the fourteen days preceding the three days event window, while in the subsequent ones we show a CAR of 1.16% for upgrades and of -1.29% for downgrades, both statistically significant, even if the average abnormal returns are not significantly different from zero.

The results show that abnormal volumes beginning some days before the event window both for upgrades and downgrades. We do not find, instead, any effect in correspondence of the publication of report on the Stock Exchange website.

It remains to be investigated the reason of a market reaction before the report date, i.e. if there are relevant information before that date or if a violation of the Italian regulation occurs.

The structure of the paper is the following: the second paragraph presents a survey of the literature; the third paragraph explains the methodology applied and the database used; the fourth paragraph comments the results obtained and concludes.

## 2. Survey of the literature

The literature on analysts is really wide, ranging from studies on earning forecasts to market reaction to changes of target prices, earnings estimates or recommendations. With regard to this last field, we can highlight several empirical evidences from previous studies.

With reference to the US stock market, Womack (1996) has analyzed 1,573 recommendation changes issued between 1989 and 1991 on 822 companies. The study uses the First Call database, finding that firms subject to recommendation changes record large

abnormal returns on their stocks. While this happens in the short run, in the post-event period, for buy recommendation there is a mean post-event drift, but short-lived (one month), whereas for sell recommendation is larger and lasting for six months. The asymmetry between buy and sell recommendations can be explained with the higher frequency with which analysts issue upgrades and with the greater cost of issuing a negative ratings.

The post-event drifts contrast with the efficient market hypothesis since the information contained in the report is not immediately incorporated in stock prices. In correspondence of the diffusion of the report, Womack calculates a coefficient of abnormal volumes: on average, recommendations that add a stock to the buy list induce abnormal volumes of 190% while recommendations that add a stock to the sell list induce abnormal volumes of 300%. Analysts seems good in the activities of stock picking and market timing, however they mostly issue positive recommendations (the proportion of buy to sell is 7 to 1) and mainly focus on bigger companies.

Of course, it is worth to control if the reports are followed or preceded by the diffusion of price sensitive information from the issuing companies, as Juergens (1999) does measuring the value of the recommendations formulated by analysts. His analysis confirms that analysts recommendation have high informative value. What is also important, however, is to identify what firms' events are able to determine relevant price and quantity changes. In this respect, Taffler and Ryan (2002) consider all the information that can affect a company, including the anticipation or leakage of information before the diffusion to the public. The result is that while 65% of the changes in prices and volumes can be explained by publicly available information, Analysts' recommendations and earnings forecasts not associated with the diffusion of other news prevail on all other categories in terms of relevant market reactions.

In a more recent paper, Barber, Lehavy, McNichols and Trueman (2003) show that stocks upgraded by brokerage firms with the lowest percentage of buy recommendations record better returns with respect to stocks upgraded by brokerage firms that have an higher percentage of buy recommendations. The opposite occurs for downgrades.

With regard to cross-country analyses, Jegadeesh and Kim (2003) compared recommendations issued by analysts in the G7 countries between 1993 and 2002, evaluating their investment value. The authors, analyze different investment strategies consisting in buying stocks that have been upgraded and in selling stocks that have been downgraded. Their evidence shows that stock prices react significantly the day of the recommendation change and the following one. This reaction occurs in all the countries except from Italy.

The case of Italy is investigated in Belcredi, Bozzi and Rigamonti (2003) that perform a study

similar to Womack (1996). They analyze about 4,990 reports, published on the Italian Stock Exchange website between September 1999 and March 2002 issued by 56 brokerage firms on 237 listed companies. The study considers 659 changes of recommendation and documents abnormal returns and extra-volumes both for upgrade and downgrades in a three-days event window centered around the report date.

Our analysis is different in that not only considers more reports, about 5,200, but if focuses on IPOs, where the asymmetric information problem is higher, and on a greater number of firms, 117, that went public on a wider period of time, from the 1<sup>st</sup> January 1998 and the 31<sup>st</sup> December 2003.

### 3. Market reaction following changes in recommendations

#### 3.1 Descriptive analysis of the sample and rating systems

The reports on the IPOs are available on Borsa Italiana website and were issued since the 9<sup>th</sup> September 1999.

The Italian securities regulation imposes several duties on brokerage analysts. In fact, article 69 of the Consob Regulation no. 11971 of 14<sup>th</sup> May 1999 provides that issuers of financial products, authorized brokerage firms and institutions that have ownership relationships with them, are obliged to transmit to Consob and to deposit to Borsa Italiana S.p.A. all the "studies and statistics" that they disseminate to the general public, on the same day of dissemination. If the reports are only for the issuing firm's shareholders, or of a firm that has a control relation with it, or again for the brokerage firm's clients, then the deposit to the Stock Exchange can be delayed. The maximum number of days of delay in depositing reports to the Stock Exchange changed over time: until the 12<sup>th</sup> June 1999 it was 15 days, than passed to 10 days until the 16<sup>th</sup> June 2001, to arrive at the current provision of 60 days.

It should be highlighted that the reports have to be analyzed manually one by one, being not homogeneous, representing a rather time consuming procedure.

We have performed a careful analysis of the sample, eliminating double reports or reports lacking the recommendation or other fundamental information, so that the final sample contained 4,663 reports issued by 56 brokerage firms.

The greater part of the sample is from the Ordinary Segment of the Italian Stock Exchange (53 out of 117, the 45% of the total). Several companies (44 out of 117, the 38% of the total of IPOs) are included in the Nuovo Mercato, the High-Tech segment of the Italian Stock Exchange.

In appendices 1 and 2 we give more deZtails and summary tables on firms and brokerage houses considered.



Eight of the first ten companies with the greatest number of reports received on average per year are also in the first ten largest companies for capitalization. This result seems to support the hypothesis of a greater attention of the analysts to the so-called “glamour stocks”, i.e. the empirical evidence of a positive correlation between the average number of reports and the size (measured by post-offering capitalization) already shown in previous researches.

Classifying the recommendations, it is possible to see how different analysts use different rating systems.

A rating system is a tool that analysts use to propose their recommendations. While the most simple rating system consists of a three-points scale (buy, hold, sell), perhaps the most used by analysts is the five-points scale system, with outperform and under-perform as intermediate ratings. It is, however, possible to have other rating systems with a different number of classes (six or eight for example) or even numerical systems. Recommendations can be formulated depending on the expected differential in performance between the stock’s total return and a reference index. It is however unavoidable a certain degree of subjectivity in realizing a rating system that pretends to be representative of the recommendations.

We classify the recommendation using a five-points scale, in line with previous studies in the literature, but non yet used, to the best of our knowledge, in Italy. In this respect, this represents a contribution to the literature.

Furthermore, it is possible to see that the rating systems are not homogeneous, so it is important to pay attention while comparing similar recommendations issued by different analysts. In other words, the buy recommendation given by a specific analyst can be his/her highest valuation, or can follow a “strong buy” and correspond to an “outperform” of another analyst.

We want to highlight the presence of 153 studies that show recommendations that do not fit in our rating system, or that do not contain any recommendation. In some cases the analyst simply

does not formulate a recommendation and procrastinate.

### 3.1.1 The matrix of recommendation changes

After defining the rating systems, we have to construct the so-called matrix of recommendation changes.

There are two fundamental reasons to analyze recommendation changes instead of the series of recommendations itself [Stickel (1995)].

The first one is that an informational efficient market should react to new information, and not to the reiteration of past information. The second is that analysts’ recommendations are subject to “calendar clustering” since they are quite often issued in response to the publication of periodical financial reports from the companies, or after important announcements. To analyze the recommendation changes we have considered only those reports that contained the current and previous rating.

Table 3 proposes a summary of the recommendation changes, highlighting the percentages of recommendations unchanged, upgraded or downgrades. It is worth noting that the percentage of upgrades is less than the percentage of downgrades.

Brokerage analysts tend to revise with greater frequency their recommendations downward rather than upward.

This result is in contrast to what found in previous works. However, it can probably be explained if we consider the period in which the reports were issued (end of 1999 through 2003).

In correspondence with one of the greatest bear markets of all times (2000-2001), the greater presence of downgrades than upgrades is consistent with the phenomenon known as “optimism bias” of financial analysts [O’Brien (1998)] claiming that analysts tend to be excessively optimistic in their initial forecasts and only with some delay and gradually they revise their recommendations.

**Table 3.** Changes of recommendation – Summary

Recommendation	Number of reports	(%)
Unchanged	2,878	78.31%
Upgrade	264	7.18%
Downgrade	380	10.34%
Other recommendations	153	4.16%
Total	3,675	100%

Once analysts revise their initial optimistic estimates, the number of downgrades becomes greater than the one of upgrades.

Table 4 presents the matrix of changes of recommendations in more details.

**Table 4.** Matrix of changes of recommendation

		Current Rating					
		buy	o.p.	hold	u.p.	sell	Total
Previous Rating	buy	961	67	93	3	9	1,133
	o.p.	48	655	108	10	7	828
	hold	52	94	1,014	19	61	1,240
	u.p.	2	6	21	68	3	100
	sell	7	4	27	3	180	221
	Total	1,070	826	1,263	103	260	3,522

Reports containing first recommendation changes from each brokerage firm on the sample of firms considered are 404 (249 downgrades; 155 upgrades). On average, the first downgrade is issued 802 days after the date of the IPO, while the first upgrade after 738 days. The first downgrade in absolute terms has been issued 74 days after the IPO. The first downgrade that has been issued more far from the date of the IPO has been issued after 1,959 days. The first upgrade in absolute terms has been issued after 62 days from the IPO. The first upgrade, that has been issued more, has been issued after 1,686 days. Analyzing the trend of upgrades and downgrades it is possible to see that, on average, analysts are faster in issuing upgrades than downgrades testifying an “excessive optimism” on the stocks that they cover. In other words, it seems that they would need less time to upgrade their recommendations since they trust on the fundamentals of the company; for the same reason, in case of poor income perspectives, they should be more reluctant to issue a downgrade and should take more caution in downgrading their recommendation. However, it is also possible to claim that the greater celerity with which analysts issue positive rather than negative recommendations can be related to a prior access to positive news and a delayed access for negative ones.

This explanation is coherent with the evidence found, among others, by Brown (2001), showing that managers or other insiders of the company under coverage are more prone to disseminate positive news and to postpone the diffusion of negative ones, in particular when the results obtained are less than expected.

### 3.2 Methodology

In what follows, we examine the market reaction to the diffusion of the reports. The impact of an upgrade or a downgrade has been measured using the event study methodology. To determine the informative and investing value of the reports, we have separated the so-called “report date” from the “public access date”.<sup>18</sup> We have performed two different kinds of

event study analyses: the first one takes as the event date the report date, i.e. the date in which the report is given only to the private clients of the analyst (“event study 1”); the second one, instead, take as event date the so-called “public access date”, i.e. the date in which the report is made public on the website of Borsa Italiana S.p.A. (“event study 2”). We have decided to adopt a five-point scale rating system in line with several studies in the international literature. If no news is conveyed in the recommendation change, then no portfolio adjustment should take place in correspondence of the day in which the report is transmitted only to the clients of the brokerage firm. Both the returns and the volumes should not vary in a statistically significant manner with respect to normal values. In this case, the research activity performed by the analysts is worthless. On the contrary, if the informative content of the report is relevant and the market is efficient, there should be abnormal returns and abnormal volumes the day in which it is given to the private clients of the analyst and immediately disappear. If the market is informatively efficient, no significant reaction should take place at the public access date, since profit opportunities relative to the new information should have been already incorporated by portfolio adjustments that had taken place around the report date.

#### 3.2.1 Abnormal returns analysis

In order to calculate abnormal returns, we use the standard event-study methodology [Brown and Warner (1980), (1985)], adopting the Market Model. The event window is composed by the fifteen days around the event, i.e. [-15; +15], both for the report and public access date.

The estimation window, instead, necessary to estimate the Market Model parameters, and therefore to calculate abnormal returns, is considered in the 120 days preceding the event window [ $-135 \leq t \leq -16$ ])

Averaging the abnormal returns corresponding to the N recommendations changes for the securities included in the sample ( $i = 1, 2 \dots N$ ) we finally obtain the mean abnormal return for time t (ARt). In order to assess the global effect of recommendation changes over the whole time event [ $-15 \leq t \leq +15$ ], the daily mean abnormal returns have been aggregated in cumulative abnormal return (CAR).

<sup>18</sup> Belcredi, Bozzi and Rigamonti (2003) were the first to use this distinction for Italy.

To test the statistical significance of our results, we performed the standard parametric test proposed by Boehmer E., Musumeci J., Poulsen A.B.<sup>19</sup>.

### 3.2.3 Abnormal volumes analysis

With regard to the analysis of abnormal volumes, we decided to use the volume ratio proposed by Womack<sup>20</sup>.

Following this method, the abnormal volume for each firm in the sample is calculated as a ratio of the volume for each relative event day to the average volume calculated from three months (60 trading days) before to three months after the event day (excluding the three day event period).

Then, Averaging the abnormal returns observations corresponding to the N recommendations changes for the securities included in the sample ( $i = 1, 2, \dots N$ ), we obtained an Abnormal Volume Ratio  $AVR_i$ :

Lastly, for mean abnormal volumes in response to recommendation changes issued by analysts, we determine a standard parametric test to assess whether the event has an impact on the mean of volumes.

### 3.3 Empirical evidence on average abnormal returns

In what follows we present the results obtained for average abnormal returns in correspondence of the recommendation change for each event study, with reference to the report date (figure 4 and table 6), and the public access date (figure 5 and table 7).

From table 6 we can notice that after the report date there are average abnormal returns significantly different from zero. For upgrades the abnormal return is 1.01% while for downgrades is equal to -0.92%, both statistically significant. It seems that the market reaction for upgrades is slightly greater than the one for downgrades. However, in the discussion of the results obtained for cumulative abnormal returns we will highlight that the CAR following a downgrade is greater than the one following an upgrade, in line with the previous literature. It is worth to notice that we observe abnormal returns not only at the report date, but also in the days close to it. All the abnormal returns in the time window [-1,+1] are statistically significant. For upgrades the abnormal return is significant also the second day before the report date, while for downgrades we find abnormal returns significantly different from zero until the third day after the report date. In figure 4 we give a graphical representation of these results.

Table 7 refers to the public access date. We do not find any abnormal return after the publication of the report in the Stock Exchange website, confirming

the hypothesis of an efficient market that react at the report date.

Figure 5 shows the average abnormal returns around the public access date. It can be noticed that there is no relevant reaction in correspondence of this date, while there is a reaction in the preceding period, following the diffusion of the recommendation change at the report date. We would like, however, to highlight that there are significant abnormal returns even after the public access date.

To verify if these results create value for investors we calculated cumulated abnormal returns on different time windows.

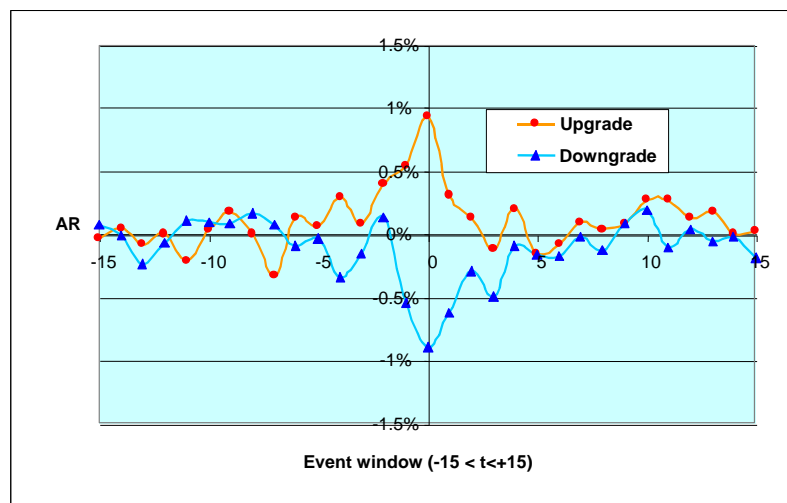
<sup>19</sup> See Boehmer E., Musumeci J., Poulsen A.B. (1991), pp. 253-272. This is the technique used in Belcredi, Bozzi and Rigamonti (2003) on the Italian case.

<sup>20</sup> See Womack (1996).

**Table 6.** Average abnormal returns in correspondence of the report date

Report date					
Days	Upgrade		Downgrade		
	AR	t	AR	t	
-15	-0.04%	-0.2679	0.10%	0.7332	
-14	0.09%	0.5657	-0.04%	-0.3540	
-13	-0.09%	-0.6986	-0.29%	-2.6070	**
-12	0.02%	0.1699	-0.05%	-0.4496	
-11	-0.22%	-1.6365	0.08%	0.6529	
-10	0.02%	0.1216	0.06%	0.5399	
-9	0.14%	0.9524	0.05%	0.4174	
-8	-0.01%	-0.0680	0.14%	1.1429	
-7	-0.30%	-2.2265	0.08%	0.5292	**
-6	0.13%	0.7557	0.03%	0.1947	
-5	0.05%	0.3200	-0.05%	-0.3234	
-4	0.26%	1.4342	-0.34%	-2.2923	**
-3	0.11%	0.6830	-0.14%	-1.0632	
-2	0.40%	2.3559	0.11%	0.6722	**
-1	0.59%	2.1765	-0.54%	-3.0618	***
0	1.01%	4.3938	-0.92%	-5.2093	***
1	0.30%	1.7802	-0.60%	-4.3148	***
2	0.15%	0.8587	-0.31%	-2.4684	**
3	-0.11%	-0.7716	-0.51%	-4.0395	***
4	0.19%	1.3083	-0.07%	-0.6032	
5	-0.13%	-0.8177	-0.17%	-1.2777	
6	-0.08%	-0.5563	-0.13%	-1.0733	
7	0.07%	0.4753	-0.01%	-0.0797	
8	0.03%	0.2388	-0.10%	-0.8400	
9	0.08%	0.4982	0.11%	0.9378	
10	0.34%	1.4539	0.17%	1.2901	
11	0.31%	2.0688	-0.10%	-0.7761	**
12	0.09%	0.5996	0.07%	0.5586	
13	0.21%	1.1555	-0.03%	-0.2405	
14	-0.03%	-0.1814	0.01%	0.0668	
15	0.02%	0.1515	-0.22%	-1.7186	

Statistical significance: \* = 10%, \*\* = 5%, \*\*\* = 1%



**Figure 4.** Average abnormal returns in correspondence of the report date

**Table 7.** Average abnormal returns in correspondence of the public access date

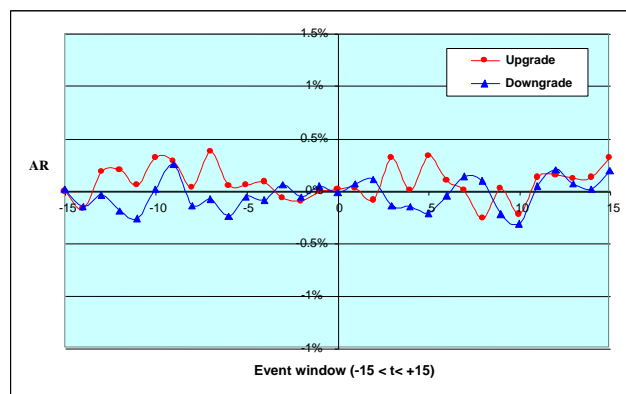
Days	Public access date				
	Upgrade		Downgrade		
	AR	t	AR	t	
-15	-0.01%	-0.0660	0.02%	0.1471	
-14	-0.17%	-1.1535	-0.15%	-1.0581	
-13	0.18%	1.2256	-0.03%	-0.2600	
-12	0.20%	1.2063	-0.19%	-1.6268	
-11	0.06%	0.3995	-0.26%	-1.9453	*
-10	0.31%	1.9223	0.01%	0.0893	*
-9	0.28%	1.7644	0.25%	1.7191	*
-8	0.04%	0.2149	-0.14%	-1.0215	
-7	0.37%	2.0884	-0.07%	-0.6660	
-6	0.04%	0.3627	-0.24%	-1.9652	*
-5	0.06%	0.4010	-0.05%	-0.4206	
-4	0.09%	0.6919	-0.08%	-0.6387	
-3	-0.07%	-0.5163	0.06%	0.4930	
-2	-0.10%	-0.6366	-0.06%	-0.5015	
-1	-0.01%	-0.0525	0.05%	0.3507	
0	0.02%	0.1472	-0.02%	-0.1423	
1	0.02%	0.1508	0.06%	0.5312	
2	-0.09%	-0.5990	0.11%	0.9379	
3	0.32%	1.4341	-0.14%	-1.1808	
4	0.01%	0.0755	-0.15%	-1.3697	
5	0.34%	2.3931	-0.21%	-1.8525	*
6	0.10%	0.5601	-0.05%	-0.3359	
7	0.01%	0.0437	0.14%	1.0339	
8	-0.27%	-1.7574	0.10%	0.7229	
9	0.03%	0.1812	-0.22%	-1.6929	*
10	-0.22%	-1.5320	-0.32%	-2.4800	**
11	0.13%	0.8543	0.04%	0.3138	
12	0.15%	1.1541	0.20%	1.3387	
13	0.12%	0.9312	0.06%	0.4754	
14	0.13%	0.8858	0.01%	0.1001	
14	0.13%	0.8858	0.01%	0.1001	
15	0.32%	1.9154	0.19%	1.3631	*

Statistical significance: \* = 10%, \*\* = 5%, \*\*\* = 1%

### 3.4 Empirical evidence on cumulated abnormal returns

To estimate the global effect of the recommendation changes on the whole period considered, daily average abnormal returns have been aggregated to obtain the Cumulative Abnormal Return (CAR) on different time windows. We have divided the period [-

15; +15] in three main windows: a three days window centered on the event date [-1; +1], a window of fourteen days preceding the previous central event window [-15; +2] and a third one including fourteen days following the central three days event window [+2; +15].



**Figure 5.** Average abnormal return in correspondence of the public access date

Table 8 shows the results for the three time windows considered. The results confirm the expectations: we find a CAR significantly different from zero both for upgrades and downgrades in the

three days window centered around the report date, while the CAR on the three days window around the public access date are not statistically significant.

**Table 8.** Cumulated Abnormal Returns for event study 1 and event study 2

		<i>Event study 1</i> (Report date)			<i>Event study 2</i> (Public access date)		
		CAR	t		CAR	t	
<i>Upgrade</i>	[-15; -2]	0.56%	0.88318		1.30%	2.31601	**
	[-1; +1]	1.89%	6.57293	***	0.03%	0.13324	
	[+2; +15]	1.16%	1.87438	*	1.07%	1.71959	*
<i>Downgrade</i>	[-15; -2]	-0.26%	-0.43911		-0.95%	-2.15244	**
	[-1; +1]	-2.06%	-8.50805	***	0.10%	0.46849	
	[+2; +15]	-1.29%	-2.65161	***	-0.23%	-0.44429	

Statistical significance: \* = 10%, \*\* = 5%, \*\*\* = 1%

For event study 1, the CAR on the window [-1; +1] is equal to 1.89% for upgrades and -2.06% for downgrades, both significant at 1%. It is worth to notice that in the fourteen days following the central event window, there is a CAR of 1.16% for upgrades and -1.29% for downgrades, signaling that the stock market does not immediately incorporate the information in the days around the event. CARs are not statistically significant, instead, before the event window. The results of event study 2 show that CARs are not significant in the three days window around the public access date while they are statistically significant in the fourteen days that preceded this date. This confirms the evidence the market react before the report is published in the Stock Exchange website, i.e. after the report date, when the information is transmitted to prices through the activity of the analysts' private clients. To verify the robustness of our results, we calculate CARs also on other time windows. For event study 1, we distinguish among upgrade and downgrade. For upgrades, the three days window centered on the report date is divided in the intervals [-1; 0] and [0; +1]. The CAR on the first window is 1.60% while the one on the second interval is 1.31% both statistically significant at 1%. It is possible to interpret the first result how the cumulate abnormal return of an hypothetical investor that had received the information contained in the report the day preceding the report date and made transactions based on this private information.

If one excludes the possibility that on the day preceding the report date some price sensitive information are diffused, this would imply a violation of the Italian financial regulation that prescribes that analysts have to transmit the report to the Consob and deposit it to the Stock Exchange managing company

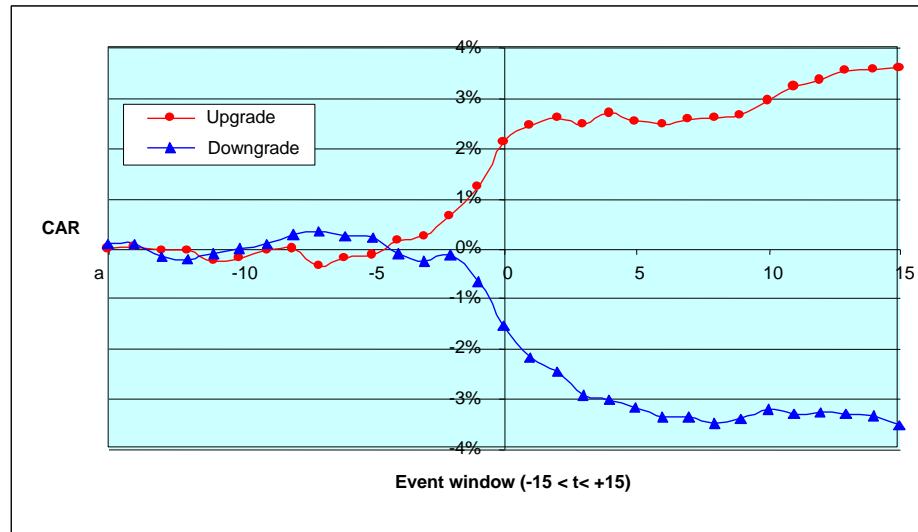
the same day that they give it to their private clients. The second hypothesis refers to a private client of the analyst that receive the information at the report date and trade on it until the following day. In this case, the investor still gains a positive CAR that is significantly different from zero. The information included in the recommendation change, then, seems to have value for investors. The CAR on the window [-15; -2] are not statistically significant also using other time windows, while in the following period the CAR on the window [+2; +15] that were slightly significant, become not significant if one excludes the abnormal return of the eleventh day.

For downgrades, the CAR is not significant in the three days window centered on the report date. Dividing the window in two sub-periods, we find that the CAR on the window [-1; 0] is -1.46%, while the one on [0; +1] is 1.53%, both significant at the 1%. These are the cumulative abnormal returns obtainable, respectively, by an hypothetical investor that uses in an illegal way the information contained in the report before the report date, and by an investor that operates in a legal way from the report date selling the stocks objective of downgrade. The empirical evidence that showed cumulative abnormal returns statistically significant in the fourteen days subsequent the event window, if verified on different time windows, highlights that we should take with care the hypothesis of a post-event drift. We find a CAR of -0.82% on the window [+2; +3], significant at the 1%, while for the subsequent period [+4; +15] the CAR is not statistically significant.

The results obtained for the whole period, presented in table 8, are presented in figures 6 and 7 where we compare the cumulative abnormal returns following, respectively, the report and the public

access date. From figure 6, it is possible to note that the cumulative abnormal returns are significant starting from the day before the report date until the

following one, and then the stabilize and remain quite constant.



**Figure 6.** Cumulate abnormal returns in correspondence of the report date

It is interesting, instead, to note in figure 7 how CARs are significantly different from zero in the period preceding the public access date, confirming the market efficiency on reacting at the report date. We would like to highlight that in a study on the G7 countries Jegadeesh e Kim (2003)<sup>21</sup> do not find any abnormal returns in correspondence of the recommendation changes for Italy, as an exception among the countries considered. The authors, however, use the I/B/E/S database that in our view is not appropriate to the goals of an analysis of the market reaction to recommendation changes since it does not consider the report date. Comparing the report dates in our database with the ones in I/B/E/S database we highlight that the last ones follow our dates, giving evidence that the database provided by Thomson Financial is based on the public access date, instead of the report date, or at least on a date that is subsequent to the report date. This evidence would justify the fact that the author do not find any abnormal reaction for Italy. Thomson Financial also offers the database First Call, that is very detailed on the way analysts transmit the report.<sup>22</sup>

### 3.5 Empirical evidence on abnormal volumes

The analysis on abnormal volumes is performed both for the report and the public access date, and it is

presented in tables 9 and 10, and in figures 8 and 9, both for upgrades and downgrades. In correspondence of the report date, there are abnormal returns equal to 1.377109 for upgrades and 1.482507 for downgrades, respectively the 37.71% and 48.25% more than the average, both statistically significant at 1%. From these results it is possible to notice that the market reaction in terms of volumes is greater for downgrades than for upgrades. This evidence is in line with the results found in the literature that affirms that, being the frequency of downgrades smaller than the one for upgrades, the reaction following downgrades is greater than for upgrades.

Both for upgrades and downgrades there are abnormal volumes in the period around the report date starting from four (three) days before this date for upgrades (downgrades) and until the second day after the report for each recommendation change. It should be highlighted that only for downgrades there are volumes significantly lower than the average, starting from the eleventh day after the report date.<sup>23</sup>

Table 10 shows the market reaction in terms of volumes around the public access date. There are no significant abnormal volumes above average in the considered period. On the contrary, for downgrades it is possible to observe that around the publication of the report on the Stock Exchange website there are volume below average. The results just described are shown in figures 8 and 9.

<sup>21</sup> See the table in Jegadeesh and Kim (2003) at p. 34.

<sup>22</sup> This database could represent the only alternative to the database provided by the Italian Stock Exchange on its website. It would be important to compare this database with the one used in this study.

<sup>23</sup> It remains to be explained the meaning of this empirical evidence.

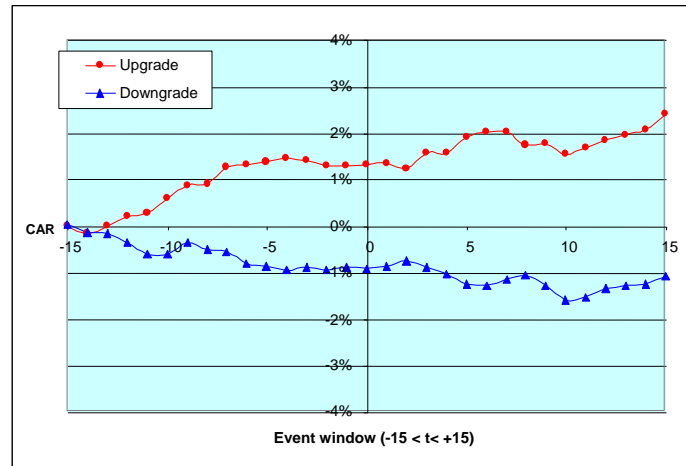


Figure 7. Cumulate abnormal returns in correspondence of the public access date

Table 9. Average abnormal volume ratios at the report date

Days	Report date				
	Upgrade			Downgrade	
	AVR	t		AVR	t
-15	0.999611	-0.00648		1.040393	0.670191
-14	0.935206	-1.33103		0.940129	-1.14559
-13	0.980666	-0.35816		0.917181	-1.82496
-12	0.991303	-0.14715		0.978373	-0.33375
-11	0.980623	-0.29111		1.057776	0.784881
-10	0.970704	-0.49035		1.01354	0.200394
-9	1.043274	0.572952		0.98722	-0.23871
-8	1.047887	0.639675		1.052709	0.852352
-7	0.994107	-0.10188		1.098485	1.451727
-6	1.030558	0.470686		1.031289	0.609471
-5	1.077311	1.099526		1.069214	1.031261
-4	1.221582	1.944162	*	1.09895	1.16007
-3	1.31508	3.15378	***	1.120036	1.671383
-2	1.315316	2.442495	**	1.216338	2.608156
-1	1.378571	3.186804	***	1.413977	4.051001
0	1.377109	3.81199	***	1.482507	4.731404
1	1.28047	3.324896	***	1.204806	3.075526
2	1.226462	2.745739	***	1.10277	1.71441
3	1.128582	1.434252		1.075282	1.133502
4	1.115261	1.625091		1.025862	0.452258
5	1.104858	1.479193		1.09542	0.919377
6	1.032063	0.462292		0.940103	-1.34303
7	1.027829	0.378128		0.929352	-1.52739
8	0.989793	-0.19623		0.939523	-1.19514
9	1.006434	0.096097		0.941117	-1.01964
10	1.200135	1.86162	*	0.872022	-3.47654
11	1.05791	0.692054		0.916043	-1.78862
12	1.039564	0.569695		0.892544	-2.16614
13	1.133724	1.296073		0.912815	-1.60399
14	1.008281	0.118813		0.877299	-2.62019
15	1.009623	0.126731		1.043006	0.600383

Statistical significance: \* = 10%, \*\* = 5%, \*\*\* = 1%

Table 10. Average abnormal volume ratios at the public access date

Days	Public access date				
	Upgrade			Downgrade	
	AVR	T		AVR	t
-15	0.974352	-0.23945		0.840382	-3.81999
-14	0.999188	-0.00991		0.895909	-2.10364
-13	1.041609	0.49963		0.880257	-2.35563
-12	1.061126	0.578349		0.938808	-0.97732
-11	1.182687	2.040784	**	0.993906	-0.08634
-10	0.96666	-0.47856		0.99369	-0.08854



-9	1.050719	0.624129		1.008713	0.14114	
-8	1.030865	0.43159		0.96825	-0.6807	
-7	1.142437	1.525024		0.91603	-1.53539	
-6	1.032414	0.414048		0.93564	-1.12705	
-5	0.85915	-2.79176	***	0.906091	-1.58893	
-4	0.946074	-0.83682		0.937705	-1.01738	
-3	0.957597	-0.71569		0.94895	-0.93309	
-2	1.01063	0.151068		0.929421	-1.38648	
-1	0.92814	-1.05138		0.848342	-3.05342	***
0	0.922119	-1.04793		0.796704	-4.92601	***
1	0.862244	-2.12313	**	0.819813	-3.32934	***
2	0.946815	-0.62802		0.860322	-2.88789	***
3	0.962575	-0.46911		0.880718	-2.40474	**
4	0.887984	-1.50801		0.823372	-3.82438	***
5	0.85979	-3.07128	***	0.755051	-7.4672	***
6	0.920619	-1.11471		0.88766	-1.57914	
7	1.027971	0.312663		0.974258	-0.36896	
8	1.053813	0.594411		1.06865	0.660418	
9	0.987794	-0.1486		0.924436	-1.35711	
10	0.984242	-0.17264		0.880812	-2.36257	**
11	0.932763	-1.27551		0.949154	-0.90315	
12	0.982054	-0.21338		0.893242	-2.32459	**
13	0.875158	-2.18682	**	0.956188	-0.82394	
14	0.939415	-0.80648		0.919538	-1.39746	
15	0.901713	-1.4008		0.87578	-2.07246	**

Statistical significance: \* = 10%, \*\* = 5%, \*\*\* = 1%

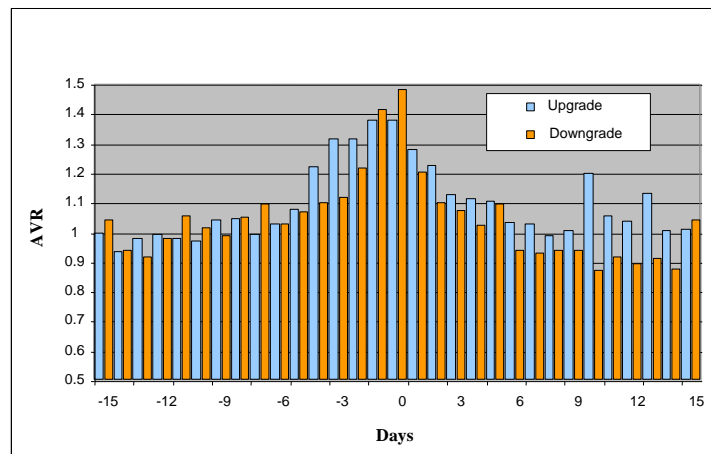


Figure 8. Average Abnormal Volume Ratios (AVRs) around the report date

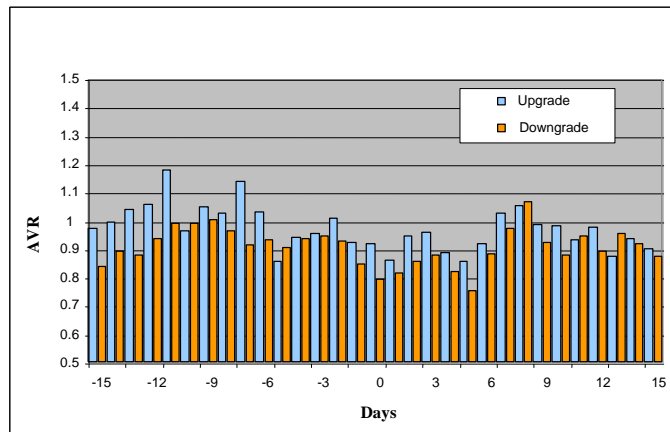


Figure 9. Average Abnormal Volume Ratios (AVRs) around the public access date

#### 4. Conclusions

Given the role of primary relevance played by financial analysts in the process of elaboration of accounting and financial data provided by listed companies, we verify if the researches they produce really convey new information to the market, and therefore if they have value. In this respect we have analyzed the impact of recommendation changes on prices and quantities of the stocks recommended by analysts, calculating both abnormal returns and abnormal volumes associated with the dissemination of the report.

The main market reaction takes place in correspondence of the diffusion of the report to the private clients of the brokerage firm and tends to stabilize around normal values in the following period. At the report date abnormal return are statistically significant: an upgrade generates in fact a positive abnormal return of 1.01%; whereas a downgrade has associated an abnormal return equal to  $-0.92\%$ .

With regard to volumes, an upgrade generates abnormal volumes that are 37.71% above average while a downgrade induces even a superior reaction, 48.25%. This confirms the evidence that the informative power of a downgrade is greater than the one associated with an upgrade. Abnormal returns and abnormal volumes are present even before the official diffusion of the report to the market, but also before the report date. We claim two main hypotheses to explain this evidence. The first explanation supposes a not full informational efficiency of the market, caused by leakage of information or by insider trading. The second one is based on the possibility that other important price sensitive news had preceded the diffusion of the report of the analyst. We do not exclude that the greatest part of recommendation changes are concentrated around the communication of earnings and that those news explain a great deal of the abnormal return associated with the recommendation change. Furthermore, we do not observe neither abnormal returns nor abnormal volumes that are statistically significant in correspondence of the public access date. For upgrades, the abnormal return is 0.02%, not statistically significant; while the volume ratio is 0.92211, not significant from a statistical point of view. For downgrades the abnormal return is  $-0.02\%$ , not significantly different from zero; and the volume ratio is 0.7967, significantly below average.

The analysis of CARs confirms these results. At the report date, for upgrades, we find a CAR of 2.16% while no CAR is statistically significant before that date, and all the CARs are significant at the 1% level in the period after the report date. For downgrades the results are very similar, a CAR of  $-1.72\%$  at the report date, no CAR is significantly different from zero before that date, while for the period after the report date all CARs are statistically significant.

With reference to the public access date, we find that CARs are significantly different from zero from a statistical point of view, starting from 9 days (11 days) before the public access date for upgrades (downgrades). This is coherent with an efficient market in which the reaction to recommendation changes begins at the report date that precedes the public access date. Around the public access date CARs remain quite significant for upgrades while for downgrades are slightly significant, and then they remain significant thereafter.

However, to better verify if there is any effect at the public access date, we also perform statistically significance tests for different windows around the report and public access date. We divide the event period  $[-15; +15]$  into three different windows. The central is the 3-days event window  $[-1; +1]$ , the others two are what we call pre-event window  $[-15; -2]$  and the post-event window  $[+2; +15]$ . The results obtained confirm the expectations: there are CARs statistically significant both in case of upgrades and downgrades in the three days window around the report date, while the CARs in the three days window around the public access date are not significantly different from zero.

With reference to the first date, the CAR on the window  $[-1; +1]$  is 1.89% for upgrade and  $-2.06\%$  for downgrade, both statistically significant. In the fourteen days following the central event window, there is a CAR of 1.16% for upgrades and of  $-1.29\%$  for downgrades, highlighting that the market seems not to fully and quickly incorporate the information in the days around the event. There are no significant cumulative abnormal returns in the three days around the public access date, while it seems evident that they are statistically significant in the preceding fourteen days, as an additional confirm that the market react at the report and not at the public access date. To verify the robustness of the results, we calculate the CARs also on other time windows, always within the considered period, that confirm the results mentioned above. With reference to abnormal volumes, it is possible to observe that the reaction happens following the report date with volumes significantly above average. At the report date, in fact, there are abnormal volumes of 1.377109 for upgrades and of 1.482507 for downgrades, i.e. the 37.71% and 48.25% above average, both statistically significant. The market reaction in terms of volumes seems therefore greater for upgrades than downgrades, in line with previous literature that affirms that, being the frequency of downgrades smaller than the one for upgrades, the reaction in the first case is greater than the second. It remains to be investigated the investment value of strategies based on portfolios based on the type of recommendation, not distinguishing only between upgrades and downgrades, but investigating the different values of different recommendations, also with reference to the average consensus, also to verify eventual herding phenomena of the Italian stock market.

The future research should investigate if price sensitive news in correspondence of the recommendation changes could affect the results deriving from the present analysis. Even if we have to take into consideration this possibility, we think that is not very probable that a so strong empirical evidence can be explain in a systematic manner by price sensitive news in correspondence of the change of recommendation from financial analysts.

To conclude, we would like to highlight that the present analysis should be enlarged to include all the listed companies in the Italian Stock Exchange to verify if the results presented here are general or peculiar to initial public offerings.

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## Appendix 1. Distribution of recommendations for IPO sample

Companies	Number of reports	%	Companies	Number of reports	%	Companies	Number of reports	%
(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Enel	293	6.28%	Mondo Tv	37	0.79%	Richard Ginori	12	0.26%
BNL	179	3.84%	Caltag. Ed.	37	0.79%	on Banca	12	0.26%
Tod'S	169	3.62%	Novuspharma	36	0.77%	PCU Italia	12	0.26%
Luxottica	159	3.41%	El.En	36	0.77%	Juventus	12	0.26%
Fiscali	156	3.35%	Giacomelli	36	0.77%	Hera	12	0.26%
B.M.P.S.	146	3.13%	Lottomatica	35	0.75%	IT WAY	11	0.24%
STMicroel.	144	3.09%	Targetti	33	0.71%	Asm Br.	11	0.24%
S.Rete Gas	144	3.09%	Astaldi	33	0.71%	Gandalf	10	0.21%
E.Biscom	126	2.70%	Tc Sistema	32	0.69%	Digital bros	10	0.21%
Ducati	112	2.40%	Datamat	30	0.64%	Algol	10	0.21%
Campari	112	2.40%	Engineering	29	0.62%	Gr.Navi Veloci	9	0.19%
AEM	105	2.25%	Aisoftw@Re	25	0.54%	Negri Bossi	9	0.19%

Coin	97	2.08%	Tas	24	0.51%	Sol	8	0.17%
De Longhi	93	1.99%	ePlanet	24	0.51%	Interbanca	8	0.17%
Acea	88	1.89%	Giugiario	23	0.49%	Roncadin	8	0.17%
Finmatica	87	1.87%	Dada	23	0.49%	Acsm	8	0.17%
Mar. Burani	85	1.82%	Fidia	23	0.49%	Freedomland	8	0.17%
Cairo Com.	75	1.61%	Meliiorbanca	23	0.49%	Dmail	8	0.17%
Saeco	73	1.57%	Emak	22	0.47%	Fiera Milano	8	0.17%
Cremonini	72	1.54%	C.Latte Torino	22	0.47%	Air Dolomiti	7	0.15%
Data Service	68	1.46%	Biesse	21	0.45%	Vemer	6	0.13%
INet	67	1.44%	Prima Ind.	20	0.43%	Socotherm	6	0.13%
Granitifandre	67	1.44%	Pol.S.Faust.	20	0.43%	Olidata	5	0.11%
Permasteelisa	65	1.39%	Chl	20	0.43%	S.S.Lazio	4	0.09%
Class Editori	62	1.33%	Esprinet	20	0.43%	Gefran	4	0.09%
Txt E-Sol.	56	1.20%	Opengate	18	0.39%	A.S. Roma	4	0.09%
Aem Torino	55	1.18%	Tecnodif.	18	0.39%	Trevisan	3	0.06%
Ferretti	54	1.16%	Cto	18	0.39%	Beghelli	2	0.04%
C.Risp.Firenze	53	1.14%	Cde Point	17	0.36%	Buffetti	2	0.04%
Bayerische	49	1.05%	Trevi Group	16	0.34%	Aer.Firenze	2	0.04%
Reply	49	1.05%	Bb Biotech	16	0.34%	Lavorwash	2	0.04%
Mirato	48	1.03%	Meta	16	0.34%	Cit	2	0.04%
Euphon	48	1.03%	Acotel	15	0.32%	Grandi viaggi	1	0.02%
Cad It	42	0.90%	Datalogic	14	0.30%	Basic Net	1	0.02%
Art'e	41	0.88%	Marcolin	13	0.28%	Castelgarden	0	0.00%
Buongiorno	39	0.84%	Inferentia	13	0.28%	Fil.Pollone	0	0.00%
Pirelli R.E.	38	0.81%	Viaggi Vent.	13	0.28%	Isagro	0	0.00%

## Appendix 2. Distribution of recommendations for brokerage firms covering IPO sample

<i>Brokerage Firm</i>	<i>No. report issued</i>	<i>%</i>	<i>No. covered companies</i>	<i>Brokerage Firm</i>	<i>No. report issued</i>	<i>%</i>	<i>No. covered companies</i>
<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
			40				18
Unicredito	415	8.90%	70	ABN Amro	35	0.75%	10
Intermonte	398	8.54%	59	Massimo Mortari	34	0.73%	10
B.IMI	396	8.49%	57	Meliiorbanca	33	0.71%	11
IntesaBci	313	6.71%	44	SG Securities	33	0.71%	3
Euromobiliare	312	6.69%	30	B.Intermobiliare - Bim	22	0.47%	9
Banca Leonardo	264	5.66%	26	Fortis Bank	21	0.45%	7
Deutsche Bank	209	4.48%	73	Goldman Sachs	21	0.45%	14
Idea Global	208	4.46%	19	Albertini & Co.	20	0.43%	12
Merrill Lynch	178	3.82%	49	Citigroup	17	0.36%	9
WebSim	154	3.30%	26	C.Suisse First Boston	17	0.36%	8
Centrosim	132	2.83%	26	B.Finnat Euramerica	14	0.30%	3
Mediobanca	124	2.66%	30	Interbanca	14	0.30%	7
Banca Akros	120	2.57%	24	Credit Lyonnais	13	0.28%	9
BNP Paribas	113	2.42%	21	Uniprof sim	10	0.21%	1
G.UBS Warburg	113	2.42%	29	WestLB Panmure	9	0.19%	5
Twice	110	2.36%	37	J P Morgan	8	0.17%	1
Julius Baer	98	2.10%	11	M.Credito Centrale	7	0.15%	5
Banca Aletti & Co.	80	1.72%	26	Consors	6	0.13%	1
Sant.Centr.Hisp.	77	1.65%	37	Banca di Roma	5	0.11%	4
Cheuvreux	74	1.59%	24	Cazenove & Co.	5	0.11%	4
Ras	71	1.52%	27	Metzler Italia	5	0.11%	3
Actinvest Group	66	1.42%	24	Banknord	4	0.09%	2
Eptasim	57	1.22%	8	S.S.Smith Barney	4	0.09%	3
Lehman Brothers	52	1.12%	19	Banca Mediosim	3	0.06%	1
Cofiri Sim	42	0.90%	8	Flemings Research	3	0.06%	3
D.Kleinwort Benson	41	0.88%	17	Gestnord	3	0.06%	1
Abaxbank	39	0.84%	11	B.Pop.di Bari	2	0.04%	2
Ing Barings	37	0.79%		Banca Sella	2	0.04%	

## BANKS: REGULATION AND CORPORATE GOVERNANCE FRAMEWORK

*Maria Cristina Ungureanu\**

### Abstract

The banking sector industry is somewhat unique because it is simultaneously consolidating and diversifying. Banks' major role in stabilising the financial systems of countries and in spurring their economic growth explains the particularities of their own corporate governance. The specificity of banks, the volatility of financial markets, increased competition and diversification expose banks to risks and challenges. The banking industry is heavily regulated and supervised in every country around the globe. This, in turn, establishes a particular corporate governance system. The paper lays out the specific attributes of banks that influence their regulatory and supervisory environment, which, in turn, creates a unique corporate governance framework for the banking industry. The paper emphasises the benefits and limits of regulations and supervision on banks' corporate governance and focuses its empirical results on the European Union countries.

**Keywords:** Banking, Supervision, Corporate Governance, Market discipline, Basel framework

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### Introduction. Importance of banks and their governance

Significant attention has been given to the role of banks in the corporate governance of other firms. Banks have a major role in the functioning of firms, contributing to the formation, increase, monitoring and allocation of their capital and stimulating productivity growth. As a result, they have a major role in the governance of other firms. These responsibilities increase the importance and complexity of banks' own governance.

The importance of banks for countries' finances and for spurring economic growth explains the particularities of their own corporate governance. The topic of banks' corporate governance has been approached to a lesser extent and most authors agree that extended research in the area is necessary.

The specificity of banks, the volatility of financial markets, increased competition and diversification expose banks to risks and challenges. The increasing market orientation of banks has led to changes in approach to regulation and supervision. Visentini (1997) states that the observed forms of corporate governance of banks emerge in the course of their operations as entities having to respect the private interest of owners, on the one hand, and the public interest in the overall stability of the system, on the other hand.

The banking industry is heavily regulated and supervised in every country around the globe. This, in turn, establishes a particular corporate governance

system for banks, which is different from the traditional corporate governance of non-bank firms.

Will these circumstances develop to the point where corporate governance codes are modified in order to make provisions for the banking industry? Banks could also become more proactive in complying with corporate governance best principles, which could support the overall system of compliance.

The paper presents the main specific attributes of banks that influence their regulatory and supervisory environment in the sector, which, in turn, creates a unique corporate governance framework for the banking industry. We consider the following characteristics that are specific to banks: capital structure, equity ownership, transparency and disclosure, the stakeholder groups, competition and takeovers. The banking regulatory environment is emphasized by two areas: regulatory restrictions and Central Bank supervision in the banking industry. The conclusive part debates the benefits and limits of regulations and supervision on banks' corporate governance with the emphasis on market discipline as part of the Basel II Framework. The paper focuses its empirical results from studies on European Union countries.

### I. Specific attributes of banks

#### I.1. Capital structure

An aspect that distinguishes banks from other firms is their capital structure, which is unique in two ways

(Macey and O'Hara, 2003). Firstly, banks have little equity relative to other firms and receive 90% of their funding typically from debt. Bond holders and depositors provide the rest. Second, banks hold illiquid assets that often take the form of loans without maturity. Banks have liabilities in the form of deposits that they issue to creditors or depositors, thus creating liquidity for the economy.

A mismatch between deposits and liabilities may cause a collective-action problem among depositors. This can cause the failure of a bank, with externalities effects. Consequently, the liquidity function may create problems in the governance of banks. High loan growth raises bank capital requirements, as regulators consider most loans to be risky assets. One regulatory measure against such risks is the deposit insurance, which is considered successful in achieving what had been a major objective of banking reform for at least a century, namely the prevention of banking panics<sup>24</sup>.

Banks react to these risks through different mechanisms. Different size banks pursue different strategies. Small- to medium- size banks continue to concentrate on loans but seek to strengthen customer relationships by offering personal service. Large banks respond through securitisation, a process of converting assets into marketable securities. These strategies reflect banks' governance control.

## 1.2. Equity ownership

As with all publicly-owned firms, the diffuse and concentrated ownership of banks are aspects that influence their governance mechanisms. Diffuse ownership can effectively exert corporate control directly through their voting rights and indirectly through electing the board of directors. Information asymmetries are an impediment for shareholders and debt holders to exert control over management. In the case of banks, due to their opaqueness, diffuse shareholders and diffuse debt holders find it difficult to exercise control. This situation is managed by more concentrated ownership and increased regulation.

Concentrated ownership enhances firms' control and monitoring of its activity through a better flow of information. Large shareholders and large debt holders are more effective in exercising their rights, thus having more control over management. This context should theoretically lead to better governance of firms. In practice, evidence shows that large shareholders may exploit their interest in the firm, thus undermining its governance.

Generally, banks have a concentrated equity ownership, which makes it more difficult for small equity holders to exert influence over the management of banks. Controlled ownership by large investors may also affect the interest of debt holders – either diffuse or concentrated – and on other stakeholders,

leading to a more complex corporate governance environment for banks.

A legal system that prevents large shareholders controlling a bank from taking advantage of the small and diffuse stakeholders has the potential to stimulate good corporate governance.

## 1.3. Transparency and disclosure

Transparency is one of the main principles of corporate governance. This principle is applied to a lesser extent in the banking sector. The opaqueness of banks is factored by their sensitive operational environment: loan operations to individuals, to large entities and to governments, capital funding of firms, banks' interaction with Central Banks and governments.

An explanation for the lesser transparency is that the risk of banks' failure is not as high as the risk of non-financial firms' failure. It is often argued that banks are "too large to fail", in reference to the major stakes that governments have in these entities. In addition to funding the economy, banks also perform in a political context, which enhances the gravity of a potential failure. As a result, entities such as states and prudential supervisory bodies dominate the banking sector in order to minimise the risk of failure.

Literature presents different points of view with regard to the transparency of banks. Levine (2004) examines the implications of opaqueness for the governance of banks by diffuse equity holders and diffuse debt holders. Opaqueness may help controlling holders to exploit their stake, to facilitate the manipulation of loan operations and compensation packages. This comes at the expense of the long-run health of the banks, their diffuse shareholders and their diffuse debt holders. The opaqueness of banks may weaken market competitive forces, affecting the efficiency of the securities market. All stakeholders are negatively affected, including diffuse shareholders, customers and governments. Morgan (2002) states that "banks appear to be among the more opaque industries, but not the most opaque one". Macey and O'Hara (2003), based on a statement by Furfine (2001), argue the notoriously opaqueness of banks' balance sheet and the effects of the technology on the difficulty of monitoring banks by traditional regulation and supervision. Flannery et al (2002) consider that special government supervision can enhance banks' transparency.

Governments impose strong regulations on the banking system, by restricting the concentration of bank ownership. This is to avoid the concentration of power and control of banks, thus enhancing disclosure.

Improving the flow of information through increased disclosure enhances market discipline. This is the rationale behind the third pillar of the Basel Capital Accord, which is later discussed in the paper.

<sup>24</sup> Macey and O'Hara (2003), based on Friedman and Schwartz (1963)

#### **I.4. Corporate governance context for banks: Stakeholders**

From a generic perspective, banks are viewed as any firm with a broad range of stakeholders. In the case of banks, the group of claimants includes shareholders, who contribute to the formation of capital, as well as other categories who have a direct interest, such as: creditors, employees, general public, governments and regulators.

Referring to corporate governance models and viewing a comparison between the Anglo-American and the Franco-German models, Macey and O'Hara (2003) note the strange fact that paradigms of corporate governance differ on the basis of national boundaries rather than on the basis of the indigenous characteristics of the firms being governed. The Anglo-American corporate governance approach focuses on the interests of maximizing shareholder value, while the Franco-German model considers the interests of all stakeholders.

In the case of banks, the two authors find a hybrid approach, in which most firms are governed according to the US model, while banks are governed according to the Franco-German paradigm. The governance of banks is targeted at the interest of its shareholders, employees, creditors, local communities, customers and regulators.

There is a significant public dimension to the banking firm. In the banking context, depositors' savings and government interests are at stake (Macey and O'Hara, 2003). When the social costs of an outcome exceed the private costs of an outcome, there is a negative externality effect. In this case the failure of a bank can influence the functioning of the entire banking system. The positive externality effect is also acknowledged: good individual performance improves the health of the banking system, which benefits all stakeholder groups.

In this context, the corporate governance model argues that shareholders are not the exclusive beneficiaries of fiduciary duties. Non-shareholder constituencies claim fiduciary duties from management, in certain circumstances requesting higher protection than the duty performed in relation to shareholders. The special nature of banking requires that management duties are more extensive than those of other directors. Managers function in the light of two distinct sets of interests: one is the private interest internal to the firm and the other is the public interest external to the firm. From the banks' governance perspective, the agent seeks that behaviour beneficial to the firm's interest does not compromise the public interest (Ciancanelli and Gonzales, 2000).

#### **I.5. Mechanisms of corporate governance: product competition and takeovers**

Shleifer and Vishny (1997) analysed solutions for solving the problems of banks' corporate governance.

One solution is competition, referring to product competition and takeovers. The two authors conclude that product competition, although being the most powerful force towards economic efficiency, can not solve the problem of corporate governance. Analysing the takeover element, the two authors consider it as a second corporate governance mechanism only in the US and the UK markets.

Levine (2004) analyses the effects of opaqueness on the competition in the banking sector. The opaqueness of banks can weaken competitive forces, affecting product competition and the takeover activity. The author observes that product market competition is less frequent in the banking sector due to the personal relationships that banks establish with their clients.

Regarding the takeover activity in the banking sector, empirical research on cross-border mergers and acquisition of financial institutions shows that, between 1996 and 2000, the bulk of financial restructuring occurred on an in-sector and domestic basis. For Europe, cross-border intra-European mergers and acquisitions amounted to 29% of the European total. These figures differ considerably across sectors. The banking sector amounted to 17% of the total figure. According to Walter (2003), these figures possibly suggest somewhat different economic pressures at work. Authors debate whether the low percentage of cross-border activity in the banking sector reflects the abuse of national provisions, formally based on current legislative EU banking framework in a protectionist manner.

Among the 15 EU former member countries, the cross-border penetration in Luxembourg and Sweden is higher than the average. As at 2003, Luxembourg had a share of foreign banks in total assets of 94% and Sweden of 59%<sup>25</sup>. The extent of cross-border penetration is greater in the newly acceded EU countries than in the 15 former EU countries. The new EU member states have a share of foreign banks in total assets between 60-100%. They also have a higher degree of concentration than in the euro zone (Lannoo, 2005).

Hostile takeovers are rare in the banking sector, due to stricter regulatory requirements.

The decrease in product competition and the tension present in the cross-border takeover activity may stimulate competition for good governance of banks. Supervisory practices could be further developed via benchmarking based on best practices.

## **II. Regulation and supervision in the banking industry**

### **II.1. Overview**

The need to streamline the structure of the financial regulation and supervision and the requirements to adapt this structure to market developments led to

<sup>25</sup> Source: ECB (2003)

reforms in the financial sector and, particularly, in banking. The increase in regulations in the banking sector took place during the second half of last decade.

Banking crises, rapid technological change and the continuing globalization of banking, the overall importance of banks for the economic development and their political context have led national and multilateral policy makers to focus greater attention on the important role of bank regulation and supervision in recent years. This focus is reinforced by the fact that “one of the important trends has been, and continues to be, a move away from regulation and towards supervision”. (Crockett, 2001).

The paper analyses the following aspects that have a key impact on the corporate governance of banks:

- Banking supervision in EU: the role of Central Banks
- Regulatory restrictions in the banking industry
- Regulation and supervision: impact on banks' corporate governance

## II.2. Banking supervision in Europe: the role of Central Banks

### Overview on banking supervision

Banking supervision, based on ongoing analytical review of banks, represents one of the key factors in maintaining stability and confidence in the financial system. In addition to effective supervision, other factors necessary for the stability of banking and financial systems and markets include sound and sustainable macroeconomic policies of banking and financial systems and markets, a well-developed financial sector infrastructure, effective market discipline and an adequate banking sector safety net.

The banking supervisory process includes the establishment of a legal framework for the banking sector, the designation of regulatory and supervisory authorities and the enhancement of regulations that limit the level of risk that banks are allowed to take.

In order to be effective, the supervisory authority must have appropriate enforcement powers and an adequate degree of autonomy, in order to resist undue pressures from the government, banks and shareholders, depositors and creditors, borrowers and other entities that use financial services. Supervisory authorities should command the respect of the banks they oversee.

All banking systems have at least one regulatory and supervisory authority. However, the locus, structure and specific responsibilities of each authority are different as a consequence of the legal and economic environment of a particular country. Decisions on regulatory and supervisory authority for the national banking sector is assigned to the National Central Banks (NCBs), but the global current trend is for the consolidation of all financial supervision in a separate entity, outside the Central Bank, with the two

entities cooperating for sustaining an efficient supervisory environment.

### NCBs role in banking supervision

NCBs have a significant role in regulating the banking system. According to Healey (2001), the involvement of Central Banks in their lender of last resort role and monetary policy objectives has led them to be intrinsically interested in the stability and general health of the financial system. Concerns over the moral hazard that might result from the emergency assistance and the potential cost of financial instability in turn led NCBs to take a closer interest in the behaviour of individual banks. Often, but not always, this resulted in the NCBs supervising and, if necessary, regulating the banking system.

After Basel II was issued, a question was posed by many countries and policy makers with respect to the structure of banking supervision: whether there should be a single bank supervisory authority, or multiple bank supervisors, or whether a Central Bank should play a role in banking supervision.

Countries decide on the contentious issue or whether to assign responsibility for banking supervision to the Central Bank in addition to its responsibility for monetary policy. The trend in Europe is to assign the task of supervision to an authority different and independent from the Central Bank. Since the launch of the euro in 1999, the European Central Bank (ECB) is in charge of monetary policy of countries participating in the eurozone, but not bank regulation and supervision, which still resides in the individual countries. In all cases, however, the Central Bank and the supervisory authority are expected to share information and to cooperate. This expectation is sometimes formalized by a memorandum of Understanding (MoU).

We find differences between the EU member countries regarding the role of NCBs in banking supervision. The most significant difference is between the UK and the euro area countries and is principally caused by the following aspects:

- the monetary policy conducted by the Bank of England in the UK and the ECB in the euro area (NCB's having had lost this role);
- the difference between the UK and the Continental European corporate governance systems.

ECB supports the preservation of a fundamental role for NCBs in prudential supervision in the euro area countries. In most EU countries NCBs are either directly responsible for prudential supervision or strongly involved in this activity. In some countries adjustments in the institutional structure have recently been made. In other countries the debate and further adjustment is ongoing.

Banking supervision entails an array of tasks that can improve the governance of banks, hence the importance of involving the NCBs in this area.



According to the ECB, supervisory functions can be grouped into three classes:

- *Investor protection activities*, which are focused mainly on the issuance and enforcement of rules on the conduct of business and the disclosure of information;
- *Micro-prudential supervision*, which aims at the protection of depositors and other retail creditors;
- *Macro-prudential analysis*, which encompasses all activities aimed at monitoring the exposure to systemic risk and at identifying potential threats to stability arising from macroeconomic and financial market developments.

While the third type of task is performed, in some way, by all NCBs, the activities relating to investor protection, especially in the securities markets, are very rarely included in their mandate. This enforces the view that cooperation with the supervisory authority that overlooks the entire financial sector is necessary for improving the corporate governance of the banking industry, but also the stock market operational framework.

### **Arguments regarding central banking supervisory role**

The conceptual literature is split between the relative advantages and disadvantages of the Central Bank being a bank supervisor.

*Arguments in favour of combining prudential supervision with Central Banking* can be grouped into three basic categories: (1) information-related synergies between supervision and core central banking functions; (2) focus on systemic risk; and (3) independence and technical expertise.

*Information synergies.* Assigning supervisory functions to the Central Bank would facilitate direct access to pertinent information and readily available knowledge of the condition and performance of banks. Furthermore, should there be a crisis in financial markets, the NCB would be inevitably involved. NCB's supervisory input is crucial for assessing whether an illiquid bank asking for emergency liquidity assistance is solvent, for instance, in order to limit the scope for moral hazard.

*Focus on systemic risk.* The accessibility to information, in turn, can help it identify and respond to the emergence of a potential systemic problem in a timely manner. This could assist monetary policy to the extent that it plays out through the credit channel and would thus monitor credit risks. Supervisory responsibility also may help NCBs implement their lender-of-last resort functions better, distinguishing solvent but illiquid banks from simply insolvent banks. The systemic risk argument relies on the close relationship between prudential controls of individual intermediaries and the assessment of risks for the financial system as a whole.

*Independence and expertise.* Independence of supervisory authority from political interference is

important for effective supervision, particularly in countries where governments have more control over banks. NCBs independence protects the banking system from external interference, although it does not exclude the role of governments in certain cases of crisis (e.g. tax concerns). In addition, NCBs are generally recognised as sources of excellent research and analysis on the banking and financial system.

There are also *arguments presented against attributing supervisory powers to the NCBs*, and, instead, giving fully this role to a single agency outside the NCB. According to the research done by the ECB, there are three such main arguments: (1) the conflict of interest between supervision and monetary policy and moral hazard; (2) the tendency towards conglomeration and the blurring of the distinctions between financial products and intermediaries; and (3) the need to avoid an excessive concentration of power in the NCB. These arguments do not have strong empirical evidence or sufficient ground.

The *conflict of interest* argument is related to the moral hazard, which is linked to the role of NCBs in crisis management, stemming from their supervisory responsibilities, by excessive risk-taking. The NCB would come to the rescue of the banks via emergency liquidity assistance (or by manipulating interest rates), possibly also seeking to cover up a failure in the supervisory function. Nevertheless, the importance of moral hazard may sometimes be overstated in general, since managers and shareholders of defaulting institutions, for instance, can be appropriately penalised. The NCB would not jeopardize its credibility as a monetary authority in the circumstances of such crisis.

The *conglomeration argument* has been widely used in recent debates. This argument relates to the creation of the universal bank and the links between banks, securities companies, asset managers and insurance companies, hence different types of intermediaries would compete in the same market. Central Banks traditionally play a role in banking supervision, i.e. in the monitoring of counterparties, who are an essential component in the transmission of monetary policy.

The *concentration of power* argument is strictly linked to the previous ones. Attributing regulatory and supervisory tasks to an independent NCB, especially if extended to the whole financial sector, might lead to potential abuse in the performance of public functions.

### **Banking supervision in the EU countries**

The euro area, the UK and the US are three zones with different financial operational experiences, thus having different financial supervisory models. ECB's position is that NCBs operating in the euro area and the US are carrying out supervisory tasks in an effective way. UK's model based on a single financial authority (FSA) has shown little experience regarding its performance thus far.

Following the introduction of the euro, arguments in favour of a separation of prudential supervision and central banking have lost most of their force, while those in favour of combining them have become even more prominent. In particular, an institutional framework in which the ECB's responsibilities for monetary policy in the euro area are coupled with extensive supervisory responsibilities of NCBs in domestic markets and with reinforced co-operation at an area-wide level, would seem appropriate to tackle the changes triggered by the introduction of the euro.

The study by Barth and all (2006) that compares the supervisory role of the Central Bank in 153 countries from all continents shows that approximately 60% of the countries assign the Central Bank some responsibility in banking supervision. This includes 69 countries in which the Central Bank is the single bank supervisory authority. Only two countries of the thirteen countries represented in the Basel Committee (Italy and the Netherlands) have the Central Bank as the only authority responsible for banking supervision. In 26 countries that have a multiple-bank-supervisors system, 21 of them assign some bank supervisory responsibility to the Central Bank, including the United States.

At the *European Union* level, there is trend towards converging the supervisory practices across countries. This process is under current review and implementation by the Committee of European Banking Supervisors (CEBS) which overlooks the Supervisory practices across the EU, by providing advice to the European Commission on banking policy issues and promoting cooperation and convergence of supervisory practice across the EU. This Committee fosters corporate governance principles in the EU banking sector.

CEBS published a report in June 2006 on the progress on supervisory convergence in banking. The process is focused on three main areas:

- Fostering supervisory convergence, which has as main priority the implementation of the Capital Requirements Directive, with guidelines on transparency and disclosure of supervisory rules and guidance (supervisory disclosure), the advanced approached for credit and operational risk and cooperation between home and host supervisors (supervisory review process).
- Enhancing cost-efficiency of the EU system, contributing to the finalisation of common frameworks for reporting that allows banking institutions to use a common set of templates and data formats when transmitting financial and prudential data to supervisors.
- Improving cross-border supervision, by providing guidelines on cooperation between consolidating and host supervisors

and on fostering a common European supervisory culture.

The actual impact of CEBS efforts will be visible only when CEBS guidelines will be operationally put into practice.

*United Kingdom (UK)* has a different system of financial and banking supervision that is different from other European systems, due in part to the fact that the country is not part of the euro zone.

The City of London has a history of encouraging good corporate governance based on application of simple principles to the individual and distinct circumstances of each entity. The UK system of business regulation is principles rather than rules based, thus reducing the cost to global businesses of introducing procedures to comply with detailed regulations, many of which constrain the adoption of market discipline and innovation in all sectors. The responsibility for the corporate governance system in the UK belongs to the Financial Reporting Council.

The responsibility for full financial supervision is assigned to a separate authority: the Financial Services Authority (FSA). The MoU regarding banking supervision establishes a framework for sharing information and for cooperation among the Treasury, the Bank of England and the Financial Supervisory Authority.

## II.2 Regulatory restrictions in the banking industry

As banks became more important for the overall success of the economy, in addition to using banks to finance expenditures directly, governments find it important to control them through regulation, imposing several restrictions to their activity.

The paper considers the following regulatory restrictions to the banking activity:

- Entry of new domestic and foreign banks;
- Restriction on bank activities;
- Safety net support;
- Disclosure of accurate comparable information;
- Government ownership.

Market monitoring could also be considered as a component of banking regulatory environment. This paper approaches market monitoring as an aspect that sustains the importance of banking regulation for the corporate governance of banks.

### Entry restrictions

Governments typically influence banking by regulating the entry of new banks. Banks' entry could destabilise economies under certain circumstances. Restrictions on bank entry might be caused by the natural monopoly and information asymmetries possessed by individual banks. The entry of new banks exposes consumers to the risk of fraud that could influence other banks by releasing misleading

information to customers, to the extent that depositors realise that they do not have appropriate information about the risks taken by banks. In a country banks may demand barriers to entry in order to limit competition and some regulators respond to the demands, to help them maintain political control. Nonetheless, restricting competition in banking can have negative effects on their operational environment.

There are positive effects of banks entry. Foreign banks can provide host country supervisors with additional challenges in terms of developing a comprehensive understanding of foreign banks' operations. In certain circumstances, foreign banks may also adopt home country effective supervision, in which case these are considered better practice. The potential for foreign banks to enter a country may spur domestic banks to operate more efficiently. These cases can lead to competition for best supervisory practices between countries and banks operating in different jurisdictions, which can be a positive influence on the corporate governance of banks.

### Restrictions on bank activities

The definition of the "bank" itself requires activity restrictions. Banks must be licensed and are subjected to regulations specifying the activities in which they are permitted to engage. Countries may restrict banks to a narrow range of activities, or allow them to engage in a broad array. A bank may not perform the same activities around the world. Regulatory authorities determine the extent to which activities of banks differ across countries, the extent to which they differ from non-bank firms and the extent to which banks and non-bank firms may combine to form financial (i.e. bank and non-bank financial) or mixed conglomerates.

Such activities refer to the following:

- Securities: the ability of banks to engage in the business of securities underwriting, brokering, dealing and all aspects of the mutual fund industry;
- Insurance: the ability of banks to engage in insurance underwriting and selling;
- Real Estate: the ability of banks to engage in real estate investment, development and management.

### Safety net support

A critical part of the regulatory framework is safety net available to banks, because it affects stakeholders' incentives to monitor banks. The safety net has two components:

- The lender of last resort
- The deposit insurance system

The lender of last resort component promotes market discipline to the extent that NCBs provide

unsubsidised support to illiquid but solvent banks and allows uninsured creditors to suffer losses. This role, which is mostly performed by NCBs, raises moral hazard issues and could lead to banking crisis if abused.

The effects of regulation of the banking system on various economies may depend on whether or not a country has an explicit deposit insurance scheme and the characteristics of this mechanism. Theory provides conflicting predictions about the impact of deposit insurance on bank stability. The core arguments in favour of deposit insurance derive from the view that depositors have a difficult time assessing the quality of bank assets that creates a contagion effect, determined by depositors. By contrast, many models emphasize that deposit insurance intensifies the moral hazard problem in banking, encouraging excessive risk-taking behaviours that overwhelm any stabilisation benefits.

### Disclosure

Information gaps exist at the level where regulators and supervisors with imperfect information about banks seek to design rules and procedures that induce banks to behave in desirable ways. Information asymmetries make it difficult for the market participants (depositors, equity holders, other creditors and rating agencies) to monitor and control bank managers.

One mechanism for fostering market monitoring of banks is by requiring the disclosure of reliable, comprehensive and timely information, which is endorsed by Basel's II pillar on market discipline. His regulatory framework stresses the effective use of information disclosure to strengthen market discipline of banks.

Participating banks are expected to disclose:

- Risk exposure;
- Capital adequacy;
- Methods for computing capital requirements;
- All material information, which, if omitted or miss-stated, could affect the decision-making of the agent using the information;
- Disclosure should take place on a semi-annual basis; or quarterly in the case of risk exposure, especially if the bank engages in global activities.

### Government ownership

Banks may be government-owned, foreign-owned or domestically (private) owned. The public interest view sees government ownership of banks facilitating the mobilisation of savings and the allocation of resources towards strategic projects with long-term benefits for the economy and overcoming market failures. The private interest view argues that

governments tend to politicise strategic decisions and hinder economic efficiency.

### General assessment

Because banks affect economic prosperity, research (Barth and all, 2006) examines which regulatory practices improve the functioning of banks. They find major cross-country diversity in banking regulatory practices.

The minimum required capital ratios, varies from 4% to 20% around the world. Actual capital ratios vary from almost 0 to almost 80%. The study shows that securities activities are the least restricted in countries, while real estate activities are the most restricted. Approximately 50% of all countries offer explicit deposit insurance, a more than threefold increase in the last twenty years. Government ownership of banks varies from 0 to 98% of total banking system assets. Nonetheless, the trends in banks' ownership according to recent research shows that in the majority of cases the government ownership percentage declined. In the case of foreign ownership of banks, research evidences a wide variation in this type of ownership that varies from 0 to 100% of a country's banking sector. In many cases, the foreign-ownership percentages are quite high as a result of privatisation and subsequent foreign purchase of previously government-owned banks since 1990. Consequently, the correlation between the government ownership and the foreign ownership is negative.

Most studies on banks indicate that countries that adopt regulations forcing the disclosure of accurate, comparable information about banks to the private sector tend to have better developed banks. Nevertheless, the results of the studies also reveal regional coordination and harmonisation of bank regulations.

## III. Regulation and supervision: impact on banks' corporate governance

### III.1. Basel Framework

Various studies find that empowering direct official supervision of banks and strengthening capital standards do not lead to improvements in banking performance and social welfare. In contrast, supervisory and regulatory policies that facilitate market monitoring of banks improve their operations.

The solidity of the system of corporate governance in a business community creates a framework with a lesser need for detailed regulation to ensure effective compliance with best practice standards (FRC, 2006). There is a difference between the UK and the Continental European systems of corporate governance that reflects on the banking system, its supervision and its governance. The system of corporate governance of a country can influence on reducing the pressure from the regulatory

environment by applying a market discipline that banks would have to follow.

We consider Basel Framework to be the bridge between the strong regulatory system for banks and their corporate governance system. Basel II Framework is the approach to regulation and supervision adopted by the Basel Committee on Banking Supervision<sup>26</sup>. It is an array of regulations and principles with the objective to soften the banking regulatory environment, in order to allow banks to comply with regulations and best practice principles in a flexible, yet thorough manner, creating a protective environment for the financial system as a whole. Basel Framework embraces "best practice" in bank regulation.

### III.2. Market monitoring and market discipline

In addition to regulation on capital requirements and asset allocations, there is a trend for encouraging private monitoring of banks. Supervisory authorities may require banks to obtain and publish certified audits or ratings from international rating firms. Over the years, many economists have advocated greater reliance on market monitoring. Basel I did not acknowledge this aspect. Basel II includes this aspect as one of its three pillars.

"Market discipline is forward-looking and inherently flexible and adaptive. One of the principal merits of market discipline is that bank directors and managers are faced with the burden of proving to the market that the bank is not taking excessive risks rather than subjecting officials to the burden of proving, in a review process, that the bank is taking excessive risks. This facilitates better corporate governance by making clear that the directors and managers of a bank are responsible for its risk exposure." (Herring, 2004)

"Society needs to be alert as to how a seemingly "best practice" regulatory framework can be gamed by the regulates. This evolutionary view is consistent with greater reliance on market discipline". (Barth and all, 2006)

"Supervisors should encourage and pursue market discipline by encouraging good corporate governance and enhancing market transparency and surveillance". (BIS, 2006)

<sup>26</sup> The Basel II Framework describes a more comprehensive measure and minimum standard for capital adequacy that national supervisory authorities are now working to implement through domestic rule-making and adoption procedures. Pillar 1 of the new Basel Capital Accord refers to the minimum capital requirement. Pillar 2 refers to the supervisory review process; it complements the minimum capital requirement of pillar 1 and looks at a bank's internal procedures to manage and control risk. Pillar 3 strengthens the role of market discipline. For the original Basel II document, see Bank of International Settlements (BIS) publications.

All governments assert that they are following Basel regulation, although research evidence that differences in implementation are significant. Research by Barth and all (2006) analyses the importance of Basel II for the performance of the banking system. The results regarding the third pillar – effective use of information disclosure to strengthen market discipline of banks – indicate that countries that adopt regulations forcing the disclosure of accurate, comparable information about banks to the private sector tend to have better developed banks, hence a credible banking sector. Furthermore, countries with proactive approach to private monitoring regulations enjoy lower bank interest rate margins and lower bank overhead costs, which suggests greater efficiency. Countries that facilitate private sector governance of banks through regulations requiring banks to disclose relevant information to the public tend to have a higher degree of credibility (integrity in lending). Regarding the impact of investor protection laws on the governance of banks, research finds that strengthening the legal rights of shareholders through accurate disclosure boost the market value of banks.

The above evidence enhances the importance of regulatory and supervisory policies that facilitate market discipline of banks.

### III.3. Best practice principles in banking

In addition to the regulations provisioned by the Basel II Framework, the Basel Committee issued a document on corporate governance to help ensure the adoption and implementation of sound corporate governance practices by banking organisations<sup>27</sup>. This is not intended to establish a new regulatory framework, but rather to assist banking organisations in enhancing their corporate governance frameworks.

<sup>27</sup> There are 8 principles viewed as important elements of an effective corporate governance process:

(1) Board members should be qualified for their positions, have a clear understanding of their role in corporate governance and be able to exercise sound judgment about the affairs of the bank; (2) The board of directors should approve and oversee the bank's strategic objectives and corporate values that are communicated throughout the banking organization; (3) The board of directors should set and enforce clear lines of responsibility and accountability throughout the organization; (4) The board should ensure that there is appropriate oversight by senior management consistent with board policy; (5) The board and senior management should effectively utilize the work conducted by the internal audit function, external auditors and internal control functions; (6) The board should ensure that compensation policies and practices are consistent with the bank's corporate culture, long-term objectives and strategy, and control environment; (7) The bank should be governed in a transparent manner; (8) The board and senior management should understand the bank's operational structure, including where the bank operates in jurisdictions, or through structures that impede transparency.

The principles set forth by the Basel Committee are applicable whether or not a country chooses to adopt the Basel II Framework. The principles recognise the importance of sound corporate governance practices and the responsibility of the board of directors and senior management to manage the risk profile of the banking institution.

Corporate governance influences the banking activity conducted by the board and management by affecting:

- the setting of corporate objectives;
- bank's business on a day-to-day basis;
- the accountability to their shareholders and other recognised stakeholders;
- the compliance with applicable laws and regulations;
- the protection of the interests of depositors.

### Conclusive remarks

Good corporate governance requires effective legal, regulatory and institutional foundations that can affect market integrity and overall economic performance, even though such factors are often outside the scope of banking supervision. Nevertheless, banks' supervisory authorities have the moral obligation to comply with these principles, in order to maintain credibility and a competitive position within the banking sector.

Authors advise that care is required in using the phrase "strengthening official regulation and supervision" where banks are concerned, suggesting that the message should imply that this means adopting policies that facilitate private monitoring of banks, which enhances their efficiency and good governance.

Since the banking sector has the strongest regulatory environment among all sectors, the current trend will change the industry's corporate governance, by determining banks' boards to follow certain best practice principles rather than comply with enforced regulation by states. Nonetheless, current financial market crisis might determine supervisory bodies to adjust corporate governance best principles, which would actually *empower* banks to comply with these principles.

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## DOES OPTIMISM AFFECT CORPORATE INVESTMENT? NEW EVIDENCE FROM TAIWANESE PANEL DATA

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### Abstract

We set out in this study to examine the relationship between managerial optimism and corporate investment, and demonstrate that firms with valuable investment opportunities tend to invest less than the optimal level; the classic problem of underinvestment. On the other hand, however, firms which do not have valuable investment opportunities often tend to invest more than the optimum level; a problem of overinvestment. We present evidence on the relationship between such investment behavior and managerial optimism. Within those firms that do not have valuable investment opportunities, overinvestment is more likely to occur amongst optimistic managers than non-optimistic managers; conversely, for those firms with valuable investment opportunities, underinvestment is less likely amongst optimistic managers than non-optimistic managers.

**Keywords:** Managerial optimism; Overinvestment; Underinvestment; Earnings manipulation; Cost of capital.

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### 1. Introduction

One of the most important topics in corporate finance is the formulation of the optimal investment strategies of firms to make maximized firms value. On many occasions, managers tend to invest stray from optimal investment which is called underinvestment/overinvestment. In this paper, we focus on the way in which managerial optimism and managerial manipulation of earnings influence the underinvestment or overinvestment behavior of firms. This study shows that manager could revise the investment level from underinvestment/overinvestment to increase firms' value.

Many of the prior studies within the financial literature have demonstrated numerous examples of underinvestment (involving a firm's real investment level being lower than the optimum level). Heaton (2002) suggested that optimistic managers who are dependent on external financing will sometimes decline positive net present value (NPV) projects based upon their belief that the cost of the external financing is simply too high. Similarly, when the firm is again faced with positive NPV projects, in those cases where optimistic managers may have declined to invest as a result of the incorrectly perceived costs of external financing, free cash flow can prevent the social losses from such underinvestment. Bertrand and Mullainathan (2003), for example, suggested that managers will tend to reject new positive NPV investment projects simply because they prefer a quiet life, whilst Myers and Majluf (1984) had earlier argued that the conflicts existing between current and

prospective shareholders may also lead to underinvestment as a result of 'adverse selection'. Indeed, a firm may forgo positive NPV projects due to pre-contract asymmetric information about the investment projects and the assets in place.

Since informational asymmetry results in prospective shareholders being unaware of the true value of the firm, it can also raise the price at which they are prepared to offer funds. However, at such a price, existing shareholders may well stand to lose more if such investment projects were to be undertaken, than if they were to be simply abandoned. Myers (1977), Jensen and Meckling (1976) and Jensen (1986) argued that the conflicts existing between shareholders and bondholders also give rise to the problem of underinvestment as a result of moral hazard. Such conflicts impel shareholders to either avoid or abandon profitable projects whenever their NPV is lower than the amount of debt issued.

Conversely, many other studies within the financial literature have demonstrated numerous examples of overinvestment (where a firm's real investment is higher than the optimum level). Jensen (1986), for example, suggested that managers had incentives to use their free cash flow to engage in negative NPV projects, which would not occur if they were required to raise their capital externally at higher costs. In other words, fluctuations in free cash flow can lead to overinvestment behavior. Managers will find incentives to overinvest because of the (non-) pecuniary benefits associated with firms of larger dimensions (Jensen, 1986; Stulz, 1990).

Pinkowitz and Williamson (2005) and Faulkender and Wang (2006) reported a general decline in firm values as a direct result of overinvestment; however, since investments in cash will yield only nominal returns, investors generally tend not to place such a high value on such assets. Essentially, for those companies within which managers' interests are not perfectly aligned with those of the company's shareholders, there will be a tendency to invest in negative NPV projects (Morck et al., 1990; Lang et al., 1991; Harford et al., 2006).

Within the recent literature on behavioral finance, apart from the tendency for over/underinvestment, the personality traits or characteristics of corporate managers have also started to come under close scrutiny. Malmendier and Tate (2005), for example, reported a strong positive relationship between the overconfidence of executives and the sensitivity of investment to cash flow. Optimistic managers invariably expect that the NPV of potential projects will be greater than it actually is, and will often undertake such projects with much more haste than would otherwise be the case for a rational manager. At times, they will even undertake projects that actually have negative expected NPV.

The results suggest the existence of an under/overinvestment tradeoff with free cash flow, without invoking asymmetric information or rational agency cost theories (Heaton, 2002). Optimistic managers will overestimate the growth rate in the cash flow, whereas optimistic managers will underestimate the inherent riskiness (March and Shapira, 1987; De Long et al., 1991; Gervais et al., 2007).

Irrespective of the personality traits of managers, earnings management can also have some influence on over/underinvestment. There is considerable evidence within the literature to suggest that the systematic manipulation of performance measures by insiders will precipitate overinvestment. Teoh et al. (1998a,b), for example, found that earnings management prior to IPOs and SEOs could explain their long-term underperformance, whilst Dechow et al. (1996) saw firms committing fraud as a result of their higher ex-ante needs for additional funds. Wang (2004) also noted that firms in the rapid growth stage, with substantial external financing needs, were more likely to commit fraud.

In our study, however, we argue that potential manipulation by managers is not necessarily of the actual earnings *per se*, but instead, of the perception of earnings. Loss firm managers are perfect candidates for the manipulation of investor perceptions, essentially because their firms are not doing well. Bergstresser et al. (2006) suggested that earnings manipulation emanating from managerial motivation had a significant influence on managerial investment decisions. Xie et al. (2003) argues that board and audit committee activity and their members' financial sophistication may be important factors in constraining the propensity of managers to engage in earnings management.

This paper is seen as contributing to the literature in this field in two ways. First, we find the relationship existing between firm value and investment to be quadratic rather than linear, thereby implying an optimal level of investment. We also study the connection between firm value and investment dependent upon the quality of the investment opportunities.

Second, we develop a model to explain the processes involved in under/overinvestment, taking managerial optimism, managerial manipulation of earnings, and weighted average cost of capital into consideration.

The remainder of this paper is organized as follows. A description of our empirical approach is provided in Section 2, along with the presentation of the models. The model variable measures are described in Section 3, followed in Section 4 by a description of the dataset and the results. The closing section presents the conclusions drawn from this study.

## 2. The Model

### 2.1 Manager's investment decisions

We set out to determine whether the relationship between firm value and investment is quadratic, which would thereby imply an optimal level of investment, and which would in turn differ, depending upon the quality of the investment opportunities; the optimal level must of course be higher for firms with more valuable investment opportunities.

Within a frictionless environment, the only determinants of optimal investment decisions are the investment opportunities themselves, as measured by Tobin's marginal  $q$  (Tobin, 1969). Thus, we classify firms into two groups, those where Tobin's  $q$  is less than 1, with the firms in this group being regarded as 'non-valuable project' firms (hereafter, NVP firms), and all other firms, which are regarded as 'valuable project' firms (hereafter, VP firms).

Following Morgado et al. (2003), we develop a model which relates the value of a firm's shares to its main financial decisions, taking into account the behavior of the investment variable described above. Model I is described as follows:

$$\frac{V_{i,t}}{K_{i,t-1}} = \beta_0 + (\beta_1 + \gamma_1 Q_{i,t}) \left( \frac{I_{i,t}}{K_{i,t-1}} \right) + (\beta_2 + \gamma_2 Q_{i,t}) \left( \frac{I_{i,t}}{K_{i,t-1}} \right)^2 + \beta_4 \left( \frac{\Delta B_{i,t}}{K_{i,t-1}} \right) + \beta_5 \left( \frac{\Delta D_{i,t}}{K_{i,t-1}} \right) + e_{i,t} \quad (1)$$

where  $V_{i,t}$  is the market value of the shares of firm  $i$  at the end of period  $t$ ;  $I_{i,t}$  is the investment undertaken by firm  $i$  in period  $t$ ;  $\Delta B_{i,t}$  is the increment in the market value of long-term debt;<sup>29</sup>

<sup>28</sup>  $I_{i,t} = NF_{i,t} - NF_{i,t-1} + BD_{i,t}$  where  $NF_{i,t}$  represents net fixed assets, and  $BD_{i,t}$  are the book depreciation costs corresponding to year  $t$ .

<sup>29</sup> Since this has proved difficult to measure, we use the book value of long term debt instead.



$\Delta D_{i,t}$  is the dividend increment paid in period  $t$ ; and  $K_{i,t-1}$  is the replacement value of the assets at the end of period  $t - 1$ .<sup>30</sup> We define a dummy variable for each firm,  $Q_{i,t}$ , which is equal to 1 if, during the period, the firms has an Tobin's  $q$  value of less than 1, otherwise 0.<sup>31</sup> The model defined in Equation (1) relates to investment and firm value, whilst controlling for the two other main decisions of the firm (financing and dividends) which could have direct effects on firm value as a result of market imperfections.

The expected relationship between the increment in debt and firm value is negative; as a result of the inherent risk of financial distress, the increment in debt will have a negative effect on the wealth of shareholders. The expected relationship between dividends and firm value is positive, because, in addition to the potential effects relating to imperfections, dividends are a source of value creation for the firm's shareholders, with any increment in the dividends having a positive effect on the wealth of the shareholders. Hence, an increase in the wealth of the shareholders will tend to raise the value of the firm.

Consequently, after estimating the model, if we differentiate the firm value variable with regard to the investment variable, we obtain:

$$\frac{\partial \left( \frac{V_{i,t}}{K_{i,t-1}} \right)}{\partial \left( \frac{I_{i,t}}{K_{i,t-1}} \right)} = (\beta_1 + \gamma_1 Q_i) + 2(\beta_2 + \gamma_2 Q_i) \left( \frac{I_{i,t}}{K_{i,t-1}} \right) \quad (2)$$

With the first derivative equal to 0, and solving for the investment variable, we get:

$$\left( \frac{I_{i,t}}{K_{i,t-1}} \right)^* = - \frac{\beta_1 + \gamma_1 Q_i}{2(\beta_2 + \gamma_2 Q_i)} \quad (3)$$

Finally, if the second partial derivative of the firm value variable, with regard to the investment variable, is negative, the value obtained from Equation (3) will be maximized.

$$\frac{\partial^2 \left( \frac{V_{i,t}}{K_{i,t-1}} \right)}{\partial^2 \left( \frac{I_{i,t}}{K_{i,t-1}} \right)} = 2(\beta_2 + \gamma_2 Q_i) \quad (4)$$

Accordingly, in order to obtain the maximum from Equation (4),  $\beta_2$  should be negative, and since

<sup>30</sup>  $K_{i,t} = RF_{i,t} + RI_{i,t} + (TA_{i,t} - BF_{i,t} - BI_{i,t})$  where  $RF_{i,t}$  is the replacement value of tangible fixed assets;  $RF_{i,t} = NBF_{i,t} +$  revaluation increments of tangible fixed assets;  $NBF_{i,t}$  refers to net tangible fixed assets;  $RI_{i,t}$  is the replacement value of inventories;  $TA_{i,t}$  is the book value of total assets;  $BF_{i,t}$  is the book value of tangible fixed assets; and  $BI_{i,t}$  is the book value of inventories.

<sup>31</sup>  $Q_{i,t} = (V_{i,t} + MVD_{i,t}) \div K_{i,t}$ , where  $MVD_{i,t}$  is the market value of debt; however, we use the book value of debt instead.

the optimal level of the investment determined in Equation (3) must be positive,  $\beta_1$  should be positive. As a result, we propose the following additional hypothesis:

The optimal level of investment for VP firms,  $\left( \frac{I_{i,t}}{K_{i,t-1}} \right)^{*q>1}$  is higher than the optimal level for NVP firms,  $\left( \frac{I_{i,t}}{K_{i,t-1}} \right)^{*q<1}$ .

With  $\left( \frac{I_{i,t}}{K_{i,t-1}} \right)$  as the real investment level for the whole sample of firms, we logically expect  $\left( \frac{I_{i,t}}{K_{i,t-1}} \right)^{*q<1} < \left( \frac{I_{i,t}}{K_{i,t-1}} \right) < \left( \frac{I_{i,t}}{K_{i,t-1}} \right)^{*q>1}$ . The difference between the real investment and optimal investment levels are the underinvestment and overinvestment process measures:

$$OI_{i,t} = \left( \frac{I_{i,t}}{K_{i,t-1}} \right) - \left( \frac{I_{i,t}}{K_{i,t-1}} \right)^* \quad (5)$$

Moreover, we expect to obtain  $OI_{i,t} > 0$  as the overinvestment for NVP firms, and  $OI_{i,t} < 0$  as the underinvestment for VP firms.

## 2.2 Investment Decisions and the Characteristics of Managers

We examine the propensity for optimistic managers to overvalue their investment projects, which thereby leads to such managers investing more than other managers of a more non-optimistic nature. The levels of underinvestment and overinvestment are affected by managerial optimism and manipulation, plus the cost of capital; thus, Model II is described as follows:

$$OI_{i,t} = \beta_0 + (\beta_1 + \delta DA_{i,t}) O_{i,t} + \beta_2 DA_{i,t} + \beta_3 D_{i,t} | DA_{i,t} | + \beta_4 \Delta WACC + \varepsilon_{i,t} \quad (6)$$

where  $O_{i,t}$  is a dummy variable which is equal to 1 if the CEO is classified as being optimistic, otherwise 0; discretionary accruals ( $DA_{i,t}$ ) represents the measurement indicator of managerial manipulation;  $D_{i,t}$  is a dummy variable which is equal to 1 if  $DA_{i,t} > 0$ , otherwise 0, and  $\Delta WACC$  is the incremental cost of capital.

The model defined in Equation (6) relates to over/underinvestment and managerial optimism, with additional controls for managerial manipulation and the cost of capital, these being the other two main factors of investment. By including  $|DA_{i,t}|$ , the model could capture asymmetric effect for managerial manipulation. The expected relationship between over/underinvestment and the managerial optimism dummy variable is positive, because optimistic managers will tend to overstate the value and importance of the project; however, managerial optimism will, nevertheless, render them more willing to invest.

Managers view earnings management as a tool to ensure that their firms meet earnings expectations. Generally speaking, positive (negative) manipulation of earnings induces of actual pre-tax earnings go upward (downward) and we add manipulation of earnings variable to control for possible bias of managerial optimism. The expected relationship between over/underinvestment and managerial manipulation is negative, as is the interaction relationship between managerial manipulation and the optimism dummy variable.

Managerial manipulations of earnings reduce the total influence that their level of optimism has on investment. The expected relationship between over/underinvestment and the incremental cost of capital is also negative, since managers should reduce their level of investment as a result of the elevated cost of capital.

### 3. Model Measurement Description

#### 3.1 Measure of Managerial Optimism

We follow Lin et al. (2005) to construct a measure of managerial optimism on a personal basis. Given that the optimism of a manager in assessing future outcomes is likely to result in upwardly-biased forecasts, we classify managers as being optimistic if their first and last forecasts overestimated the earnings for a fiscal year; i.e., if all were upwardly-biased. A forecast is defined as upwardly-biased if its error is positive, where the definition of forecast error is:

$$FE \equiv \text{Manager's pre-tax earnings forecast} - \text{Actual pre-tax earnings}$$

However, it has been confirmed in the prior literature that managers may have other incentives leading to biased forecasts; thus, in order to address concerns that the measure may in fact reflect incentives other than the optimism of managers, we exclude from the measurement construction any forecasts that may potentially be contaminated by incentive effects.

Having determined that there were three potential incentives, the forecasts were subsequently removed from the sample if they met any of the following three criteria: (i) intention to make stock offerings at a favorable price, because some firms may knowingly release upwardly-biased forecasts to temporarily boost their stock price (see: Chin et al., 1999; and Lang and Lundholm, 2000); (ii) the release of upwardly-biased forecasts by managers of financially-distressed firms, so as to mislead investors for employment concerns; although such 'cheating' can only be maintained for a short period. Frost (1997) found clear evidence of managers of distressed firms releasing grossly overestimated financial results for the current year, as compared to actual outcomes, whilst Koch (2003) found that management earnings forecasts issued by distressed firms exhibited greater upward bias and were viewed by analysts as being less credible than similar forecasts by non-distressed

firms; (iii) self-interest actions by managers involving the release of upwardly (downwardly) biased forecasts, then selling (buying) shares for the sole purpose of profiting from trades.

The optimistic manager dummy variable is defined as:

$$O_{i,t} = \begin{cases} 1 & \text{if the manager is classified as optimistic, } FE > 0 \\ 0 & \text{if the manager is classified as unoptimistic, } FE < 0 \end{cases} \quad (7)$$

Nevertheless, the measurement construction process may still fail to capture all the forecasts contaminated by incentive effects, despite all of these exclusions, since insiders may be able to trade through untraceable accounts. In order to alleviate this particular problem, we minimize the potential earnings manipulation. Kasznik (1999) demonstrated the ways in which managers could engage in income increasing (decreasing) accounting when earnings would otherwise be below (above) the management forecasts, and that earnings management activity leads to an increase in expected forecast error costs.

#### 3.2 Measure of Earnings Management

Following Dechow et al. (1995), we consider a modified version of the Jones Model, which implies the following model for total accruals:

$$TAC_{i,t} = \frac{ONI_{i,t} - CFO_{i,t}}{A_{i,t-1}} \quad (8)$$

where  $ONI_{i,t}$  is earnings before extraordinary items and the discontinued operations of firm  $i$  during period  $t$ ;  $CFO_{i,t}$  is the operating cash flow from the continuing operations of firm  $i$  during period  $t$ ; and  $A_{i,t-1}$  refers to the total assets of  $i$  firm at the end of period  $t-1$ .

Within the modified model, nondiscretionary accruals are estimated as:

$$\hat{TAC}_{i,t} = \alpha_{0i} \left( \frac{1}{A_{i,t-1}} \right) + \alpha_{1i} \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} \right) + \alpha_{2i} \left( \frac{PPE_{i,t}}{A_{i,t-1}} \right) \quad (9)$$

where  $\Delta REV_{i,t}$  is the change in revenue for firm  $i$  in year  $t$ ;  $\Delta REC_{i,t}$  is the change in net receivables for firm  $i$  in year  $t$ ; and  $PPE_{i,t}$  is the gross property plant and equipment of firm  $i$  at the end of period  $t$ .

Discretionary accruals ( $DA_{i,t}$ ) are then estimated by subtracting the predicted level of non-discretionary accruals ( $\hat{TAC}_{i,t}$ ) from the total accruals:

$$DA_{i,t} = TAC_{i,t} - \hat{TAC}_{i,t} \quad (10)$$

where discretionary accruals ( $DA_{i,t}$ ) represents the measurement indicator of earnings manipulation range.

#### 3.3 Measure of the Weighted Average Cost of Capital

In the majority of the finance textbooks (Myers and Marcus, 1996; Gallagher and Andrew, 2000) the 'weighted average cost of capital' (WACC) calculation is presented as:

$$WACC = K_d \times (1-t) \times \frac{D}{A} + K_e \times \frac{E}{A} \quad (11)$$

where  $K_d$  is the pre-tax cost of debt,<sup>32</sup>  $t$  is the tax ratio;  $\frac{D}{A}$  is the debt to total assets ratio;  $\frac{E}{A}$  is the stockholder's equity to total assets ratio; and  $K_e$  is the cost of equity capital.<sup>33</sup> A negative relationship is anticipated between the increased cost of capital and over/underinvestment.

#### 4. Empirical Evidence

##### 4.1 Data Sources

Panel data on non-financial quoted companies in Taiwan was adopted for our empirical study, with the primary source of information being the Taiwan Economic Journal (TEJ) database. Our panel was constructed to cover the 1996-2005 period in order to avoid endogeneity and unobservable heterogeneity; i.e., an unbalanced panel comprising of 542 companies on which information was available for at least eight consecutive years during that period, resulting in 5,137 observations. The structure of the panel, by annual number of observations per company, is provided in Table 1.

**Table 1.** Structure of the sample: Panel of Taiwan non-financial quoted companies (period 1996-2005)

Number of annual observations per company	Number of companies	Number of observations
10	356	3,560
9	89	801
8	97	776
Total	542	5,137

The models were estimated for only 4,595 of these companies, since a year of the data was lost due to the way in which some variables were constructed. The variables used in the estimation are summarized in Table 2, with the optimism measurement construction process being described in Table 3.

**Table 2.** Summary statistic of 542 Taiwan non-financial companies (4,595 observations).

Variable	Mean	Standard deviation	Minimum	Maximum
$(V_{i,t}/K_{i,t-1})$	0.9594	1.3020	0.0022	25.3693
$(I_{i,t}/K_{i,t-1})$	0.0370	0.1045	-0.5547	4.2397
$(I_{i,t}/K_{i,t-1})^2$	0.0123	0.2690	0.0000	17.9751
$(\Delta B_{i,t}/K_{i,t-1})$	0.0083	0.0703	-0.6834	1.1574
$(\Delta D_{i,t}/K_{i,t-1})$	0.0021	0.0178	-2.7844	0.2385

<sup>32</sup>  $K_d = (\text{interest expense} + \text{interest capitalization}) \div (\text{average long} - \text{short-term liability}) \times 100$ .

<sup>33</sup>  $K_e = (\text{cash dividend} + \text{stock dividend}) \div (\text{stock price}) \times 100$ .

**Table 3.** Details of (non-)optimism measuring construction process and regression analysis

	Firm	Forecast
Number of the sample	542	4,968
Less: Forecasts possibly due to incentives rather than optimism:		
1. Forecasts the firms conduct stock offerings within 12 months		
2. Forecasts released within 24 months before financial distress.		
3. Forecasts viewed as bad [good] news by the market and the shareholding of director increases/decreases within three months of the forecast.		(1,600)
Forecasts that meet any one of the above three criteria	542	3,368
Less: Forecasts that are not the last for the fiscal year		
Forecasts by CEOs who have only one forecast	(24)	(484)
Sumsample analyzed in this paper	518	2,884

After removing those forecasts that were potentially contaminated by incentive effects, we were left with a total of 4,968 forecasts published by 542 firms; of these, 884 firms had produced only one forecast and were therefore dropped from the sample. Retaining the resultant 2,884 forecasts, we subsequently classified the CEOs in the remaining 518 firms as either optimistic or non-optimistic. Details on the distribution of the forecasts used to identify the optimism/non-optimism of the CEOs over the period under examination are provided in Table 4. Of the 2,884 forecasts released by these 518 firms, 1,051 were optimistic and 1,833 were non-optimistic.

**Table 4.** Distribution of forecasts used to identify CEO's optimism and non-optimism over year

Year	Number of optimism	Number of non-optimism
1996	81	195
1997	106	243
1998	172	237
1999	150	247
2000	170	237
2001	133	239
2002	99	192
2003	53	132
2004	77	100
2005	<u>10</u>	<u>11</u>
Total	<u>1,051</u>	<u>1,833</u>

#### 4.2 Results

This section presents the main results of our study, including the effects of under/overinvestment on managerial optimism, managerial manipulation and the increment in WACC. The details of the LM and

Hausman tests, used to determine the model with the best fit for our analysis, are provided in Table 5. Based upon the results of the LM and Hausman tests on the manager’s investment decisions (Model I), the manager’s characteristics and investment decisions (Model II) and earnings management (the modified Jones Model), and using panel data methodology, we determined that the fixed effects model was more appropriate than the random effects model.

**Table 5.** Models of LM-test and Hausman test

Panel A : Manager’s Investment Decisions model (Model I)			
	Chi square	P-value	Estimate result
LM	1587.07	0.0000***	Panel data
Hausman	208.19	0.0000***	Fixed-effects
Panel B : managers character and investment decisions model (model II)			
LM	462.72	0.0000***	Panel data
Hausman	16.89	0.0047***	Fixed-effects
Panel C: earnings management model (modified Jones model)			
LM	21.98	0.0000***	Panel data
Hausman	15.41	0.0001***	Fixed-effects

Note : \*.10%, \*\*.5%, \*\*\*:1% significance level

The results of our examination of the relationship existing between firm value and investment, dependent upon the quality of investment opportunities, are presented in Table 6. We also included the dummy variables  $d_t$  to measure the time effect, so as to control the effect of macroeconomic variables on firm value. Consequently, we split the error term into three components: the individual effect,  $\eta_i$ ; the time effect,  $d_t$ , and, finally, the random disturbance,  $v_{i,t}$ . As a result, the final specification of the models to estimate is as follows:

$$\frac{V_{i,t}}{K_{i,t-1}} = \beta_0 + (\beta_1 + \gamma_1 Q_i) \left( \frac{I_{i,t}}{K_{i,t-1}} \right) + (\beta_2 + \gamma_2 Q_i) \left( \frac{I_{i,t}}{K_{i,t-1}} \right)^2 + \beta_3 \left( \frac{\Delta B_{i,t}}{K_{i,t-1}} \right) + \beta_4 \left( \frac{\Delta D_{i,t}}{K_{i,t-1}} \right) + d_t + \eta_i + v_{i,t} \tag{12}$$

Recall that  $\beta_1$  and  $\beta_2$  were the respective coefficients for the investment and the square investment variables for VP firms, with the coefficients for these variables in NVP firms being  $(\beta_1 + \gamma_1)$  and  $(\beta_2 + \gamma_2)$ . Since  $\beta_1$  was 7.7734 and  $\beta_2$  was -1.9097, we can confirm that the relationship between firm value and investment is quadratic for VP firms. Furthermore,  $\gamma_1$  was -7.3131 and  $\gamma_2$  was 2.0011, both significantly different from zero, which also enabled us to confirm the same quadratic relationship for NVP firms.

The optimal level of investment of NVP firms, for maximum firm value, is non-investment; thus, we assume the optimal level of investment to be zero for NVP firms. The results indicate that investment is lower than the optimal level for VP firms (underinvestment), whilst it is above zero for NVP firms (overinvestment). The coefficient for the

‘increment of debt’ variable was -0.0969 and insignificant at the 10 percent level, whilst the coefficient for the ‘increment in dividends’ variable was 4.6825 and significant. Any increment in dividends provides good information for shareholders, ultimately pushing up firm value.

**Table 6.** Estimation of the manager’s investment decisions model using panel data methodology to avoid endogeneity and heterogeneity.

$$\text{Model I: } \frac{V_{i,t}}{K_{i,t-1}} = \beta_0 + (\beta_1 + \gamma_1 Q_i) \left( \frac{I_{i,t}}{K_{i,t-1}} \right) + (\beta_2 + \gamma_2 Q_i) \left( \frac{I_{i,t}}{K_{i,t-1}} \right)^2 + \beta_3 \left( \frac{\Delta B_{i,t}}{K_{i,t-1}} \right) + \beta_4 \left( \frac{\Delta D_{i,t}}{K_{i,t-1}} \right) + d_t + \eta_i + v_{i,t}$$

	$\beta_0$	$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$	$\gamma_1$	$\gamma_2$
Coefficient	0.7867 (0.0598)***	7.7734 (0.3487)***	-1.9097 (0.5412)***	-0.0969 (0.2175)	4.6825 (0.7993)***	-7.3131 (0.4268)***	2.0011 (0.7867)***

Note: standard errors in ( ). \*.10%, \*\*.5%, \*\*\*:1% significance level

The results of the estimates of Model II are provided in Table 7, which shows that the coefficient of optimism was 0.1012 and significant at the 5 percent level. In conditions of underinvestment (overinvestment), the behavior of optimistic managers will be to reduce (increase) their level of underinvestment (overinvestment). Beside, we also want to check if there exist asymmetric effect for managerial manipulation coefficient was 0.4451 and insignificant at 10 percent level. The positive (negative) asymmetric effect of earning managerial was not significant.

The coefficient of the interaction between the optimism dummy variable and managerial manipulation was -0.6529 and significant at the 5 percent level. This result demonstrates that managerial manipulation should lead to a raise in the overall level of optimism, thus influencing over/underinvestment. The coefficient for the ‘increment in WACC’ was 0.0002 and insignificant at the 10 percent level.

**Table 7.** Estimation of managers’ character and investment decisions model using panel data for managerial optimism, managerial manipulation and cost of capital affect level of under-/overinvestment.

$$\text{Model II: } OI_{i,t} = \beta_0 + (\beta_1 + \delta DA_{i,t}) O_{i,t} + \beta_2 DA_{i,t} + \beta_3 D_{i,t} | DA_{i,t} | + \beta_4 \Delta WACC + \varepsilon_{i,t}$$

	$\beta_0$	$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$	$\delta$
coefficient	-0.9306 (0.0315)***	0.1012 (0.0427)**	-1.4534 (0.4182)***	0.4451 (0.5614)	0.0002 (0.0003)	-0.6529 (0.3806)**

Note: standard errors in ( ). \*.10%, \*\*.5%, \*\*\*:1% significance level

## 5. Conclusions

This paper makes two fundamental contributions to the understanding of investment policy decisions. First, the quadratic term of the relationship between

firm value and investment is significant, which implies there is an optimal level of investment. The optimal level of investment will vary with the quality of the investment opportunities, as measured by Tobin's marginal  $q$ . The results indicate that those firms with valuable investment opportunities can tend to invest less than the optimal level (underinvestment), whilst the investment level for those firms that do not have such valuable investment opportunities invariably tends to be greater than zero (overinvestment).

Second, we offer evidence that optimistic managers in Taiwanese firms have a tendency to overinvest conditional on several factors including managerial manipulation of earnings. We also find that if managers use manipulation of earnings to make actual pre-tax earnings go upward, they will not increase real investment to raise earnings. For the same reason, managerial manipulations of earnings reduce the influence of managerial optimism on overinvestment.

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## BANK EQUITY CLAIMS IN BORROWING FIRMS AND LOAN AVAILABILITY

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### Abstract

This study investigates the effect that bank equity claims in borrowing firms have on the availability of finance to the firm. The results suggest that allowing banks to hold equity claims in borrowing firms enhance debt availability to the firm. The results are consistent with arguments that equity claims may be helpful in transferring the benefits of an ongoing relationships to the borrowers, and thus eventually also enhance investment efficiency in the economy as a whole. The results, however, also suggest that very small or very large bank equity claims in borrowing firms do not have this impact. The results suggest that allowing banks to hold equity in borrowing firms may have some advantages. Policymakers should take this into account when reconsidering or creating regulations in this area.

**Keywords:** Relationship lending, Bank equity claims, Loan availability.

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### Introduction

A firm that wishes to fully utilize its investment opportunities is frequently reliant on different sources of outside funding. These sources may include bank loans, publicly or privately placed bonds, stock offers, supplier credit facilities etc. In a frictionless capital market, funds from these sources should always be available to firms with positive net present value investment opportunities. In practice managers often complain about not being able to borrow enough capital at reasonable rates. The fact that reasonably priced capital not always flows to firms with profitable investment opportunities may be explained by market frictions such as information asymmetries and agency costs.

The essence of the theories on asymmetric information is that firm managers or other insiders are assumed to possess private information about the characteristics of the firm's future cash flows or investment opportunities. While most theories on asymmetric information suggest that the issuance of debt is a positive event, recently more attention has been paid to the different sources of debt that a firm has to choose from.

Formal models concerning the monitoring role of banks have been developed by for example Diamond (1984) and Ramakrishnan and Thakor (1984) who state that banks have a gross cost advantage in collecting information. Assuming that this holds, and that information is durable and not easily transferred, these theories suggest that firms with close ties to financial institutions should have greater availability of capital and a lower cost of funds relative to a firm without such ties. Mayer

(1988), Mayer and Alexander (1990), Petersen and Rajan (1994, 1995) and Keysey and Watson (1995) among others are in favor of this view.

A number of other studies by, e.g., Greenbaum, Kanatas and Venezia (1989), and Sharpe (1990), argue that if the information generated in the relationship is private to the lender and not transferable to others, the fundamental consequence of close relationships is the potential creation of monopoly power. Houston and James (1997) verify this empirically and find that information monopolies associated with borrowing from a single bank lender limit the use of bank debt.

Models by Petersen and Rajan (1995), and Berlin, John and Saunders (1993, 1996) further imply, that if banks are allowed to hold equity claims in borrowing firms on a routine basis, the overall investment efficiency in the economy will improve. In other words, banks would be more willing to finance positive Net Present Value (NPV) projects with lower credit quality. In fact, a number of studies on Japanese data suggest that firms in which a main bank is one of the largest equity holders have better access to capital and are less likely to be liquidity constrained than firms without such ties. Hoshi, Kashyap, and Sharfstein (1990, 1991) show that, firms with closer ties to their main banks are less liquidity constrained than their counterparts. Weinstein and Yafeh (1998) find that close bank-firm ties increase the availability of capital to borrowing firms. Agarwal and Elston (2001) extend these investigations into the German financial markets and show, that bank-influenced firms have easier access to capital in the form of bank-debt.

This study differs from the existing literature on relationship lending and the role of bank equity ownership in two important ways. First of all, while previous studies have only suggested that bank equity claims might have an impact on loan availability or used robust measures of bank ownership, this study is the first one to empirically investigate their relationship by using actual ownership figures. Furthermore, most previous empirical studies on relationship lending have used data on small businesses and raised questions about whether their results are applicable to large enterprises. This study employs data on listed corporations making it thus possible to extend the scope of bank-borrower relationship effects to that arena as well.

The purpose of this study is to empirically investigate how corporate debt availability is affected by the existence and size of the equity claims that banks hold in these corporations. The sample includes 363 observations representing 65 Finnish firms during the years 1985 through 1991. The Finnish financial markets present an ideal environment for testing the potential benefits of close banking relationships and bank equity claims in borrowing firms, because banks play a major role in Finnish corporate finance, so much so that it is often characterized as being a “bank-based” system similar to those of Germany and Japan. Furthermore, the data on Finnish banks’ equity holdings in other corporations is publicly available for the time period in question from corporate shareholder records. The findings concerning the connection of bank equity claims and loan availability are consistent with existing literature on relationship lending in that bank equity claims seem to increase debt availability to a firm. This does not however hold for firms in which the bank holds a very small or a very large equity claim. Firms in these categories seem to be even more credit constrained than the firms in which no bank holds an equity claim.

Section two of this study summarizes previous literature on relationship lending, while section three describes the data. Section four presents the econometric tests of the determination of loan availability. Section five concludes the discussion.

### Literature on Relationship Lending

The theoretical role of financial intermediation has not always been as clear cut as it seems today. The basic problem has been that earlier theories on financial markets could not warrant the intermediaries any specific role that the market could not provide as easily. Subsequently, a number of theories have suggested that banks have a cost advantage in monitoring borrowers.<sup>i</sup> The fact that a bank monitors and lends to a firm is proposed to certify firm quality and viewed as a signal of creditworthiness by outside investors. Empirical evidence using U.S. data provide ample evidence to support this proposition<sup>ii</sup>. Based on this literature, it seems evident that the existence or renewal of a banking relationship is viewed positively

by the stock market. Positive signals to outside stakeholders are not the only potential benefits of strong firm-creditor relationships, however. Other potential benefits include enhanced credit availability and a lower cost of funds.

While evidence seems to accord with the view that an ongoing relationship between the lender and the borrower lowers pre-contract information costs, it is dubious whether these benefits are always passed on to the firms. An important determinant in this aspect is how competitive the capital market is for the borrower. The state of competition depends, of course, on the number of potential lenders in the market and how informed they are. If potential new lenders can verify the information generated in prior relationships, they can compete on par with the current lender. Should this information not be verifiable by new lenders, the current lender acquires competitive advantage vis-à-vis new lenders - a so-called information monopoly. The bank is therefore in a position to extract rents from borrowers when short-term bank loans are renewed and the firm is doing better than expected. Greenbaum, Kanatas, and Venezia (1989), and Sharpe (1990) argue that this information monopoly allows the current lender to extract rents attributable to knowing that the borrower is less risky than average.

Mayer (1988) and Petersen and Rajan (1994, 1995) express another view as to the role of credit-market competition and the value of relationships in the loan market. They claim that increased competition in financial markets reduces the value of relationships because it prevents a financial institution from reaping the rewards of helping a firm at an early stage or when in difficulties. While the absence of credit market competition is not a relevant option for creditors and firms to share future surplus the rational bank would and should require some security on the continuation of the relationship. One way to ensure bilateral commitment is for the contractual claim between the bank and the firm to include equity. According to the above mentioned studies, bank equity claims in borrowing firms may be one way to ease the transfer of the benefits of an ongoing relationship to the borrowers as enhanced credit availability.

Berlin, John and Saunders (1993, 1996) investigate in more detail the role of bank equity claims in borrowing firms. They claim that banks with (not too small) equity claims in borrowing firms are willing to finance riskier positive NPV projects than banks with all debt claims. They base this argument on a model which focuses on two key functions of an informed bank lender: (i) credibly communicating the firms prospects to its uninformed non-equity stakeholders, and (ii) controlling a borrowing firms incentives to take excessive risks, and find that the bank’s optimal financial claim will always include equity. Berlin, John and Saunders (1993) in particular claim, that a bank’s optimal claim in a firm will always include both debt and equity, since a bank

holding an all-debt claim will be excessively cautious, and a bank with an all equity claim will favor risky projects in excess. Based on a model where the bank's optimal claim will depend upon the degree of control over the firm's investment policy, the existence of a bank equity claim which is not too small (the bank will be cautious and limit its own credit supply) or too large (outside creditors will be cautious and limit their credit supply) will enhance overall credit availability to the firm.

### Data and Descriptive Statistics

The data for this study are obtained from two different sources. The data on corporate ownership, or more specifically on bank ownership of corporate equity, are obtained from corporate shareholder records. Firm specific financial data are obtained from annual reports. The sample includes all nonfinancial Finnish corporations that had a listing for at least three consecutive years on the Helsinki Stock Exchange, in the OTC-list, or the stockbroker's list during the years 1985 through 1991. The final sample consists thus of 65 firms and 363 observations.

#### [TABLE 1 HERE]

TABLE 1 summarizes the variables used in the study and TABLE 2 presents descriptive statistics. The mean book value of assets for all firms in the sample is FIM 3,159 million. On average the largest owner bank holds 5.3 percent of the company's total voting power, the minimum being 0 percent and the maximum 72 percent. While these excessively high ownership ratios are few in number, they are observed even if the banks are legally restricted to holding a maximum of 10 percent. Higher ownership ratios can be obtained by organizing sets of various holding companies. These groups of companies that center around banks used to be a typical feature of the Finnish corporate sector (much like the Keiretsu in Japan) until the mid 1990's.

#### [TABLE 2 HERE]

The average ratio of accounts payable to total assets for all firms in the sample is 0.11, and the average ratio of accounts payable to sales is 0.10. These figures seem relatively low given the average Days payables outstanding period of 78 days and the average purchases to assets ratio of 0.57. The average debt to assets ratio for the firms is 0.70, while the average debt from financial institutions to assets ratio is only 0.19.

### Empirical Results

#### How to Measure the Availability of Credit.

While the issue of whether close banking relationships enhance credit availability is undoubtedly interesting, it is unfortunately difficult, if

not impossible, to measure credit availability directly. Some studies use leverage to measure credit availability. Nakatani (1984) shows that Japanese firms with close ties to their main banks are more levered than independent firms, while Morck and Nakamura (1999) suggest that high leverage and a high ratio of loans from financial institutions to total debt can be used as indicators of strong bank ties. The validity of this approach is undermined by the fact that the firm's debt ratios are simultaneously determined by the firm's demand for credit and the supply of credit from different sources. Thus regressions that use the firm's debt ratio as the dependent variable will suffer from a simultaneous equations bias. Changes in the debt ratio can be due to changes in demand for credit or by changes in supply for credit. This statistical problem is apparent when I regress the debt from financial institutions-to-assets ratio on characteristics of the firm. The results are reported in TABLE 3.

#### [TABLE 3 HERE]

The dependent variable is the debt from financial institutions divided by the book value of assets<sup>iii</sup>. It should be obvious that credit availability is greater for higher quality firms. Consistent with this intuition, larger firms tend to have a high debt from financial institutions-to-assets ratio. However, older firms (which also are expected to be of higher quality), more profitable and more liquid firms seem to have lower debt from financial institutions-to-assets ratios. The problem with these coefficients is that we cannot tell whether older firms (or more profitable and more liquid firms) are rationed by their creditors or whether they actually have lower demand for credit. To overcome this bias, I propose an alternative and indirect measure of the credit available to the firm. A similar approach has been adopted in, e.g., Niskanen and Niskanen (2006) and Petersen and Rajan (1997).

This alternative measure will be based on an intuition that if financial institutions limit the credit extended to a firm, the firm will borrow from more expensive sources. Firms with unlimited access to institutional credit will never turn to the more expensive source. Therefore, the amount borrowed from the expensive sources should measure the degree to which firms are supply constrained by institutional lenders.

Studies by Jaffee and Stiglitz (1990) and Petersen and Rajan (1994, 1997) accord with a widely held assumption in the literature and claim that trade credit is more expensive than bank credit, and that the former is taken only if the firm is rationed by less expensive creditors. Danielson and Scott (2004) provide more recent evidence on this relationship. They use data on small US firms and find that firms increase their reliance on trade credit when bank loans are not available. All of the firms in the sample of this study are offered, and use, trade credit, which suppliers provide with their goods and services.



Clearly, this is an initially costless way to finance short-term assets, but if the payments are deferred beyond the initial discount period, the costs exceed by far the cost of any institutional loan. Therefore, it could be argued that the firms, who use trade credit more than the average firm in their industry, are credit constrained by financial institutions.

**Trade Credit Data.** In TABLE 4 I present summary statistics for the accounts payable to sales and the days payables outstanding ratios by industry. There is little evidence to support the common argument that there are considerable industry specific differences as to the usage of trade credit. The figures in panel A of TABLE 4 only suggest that the firms in the steel industry have higher accounts payable to sales ratios than the average firm and that while the firms in the forest industry have lower accounts payable to sales ratios than the average firm, the firms in the retail industry have shorter payables outstanding periods than the average firm. The differences altogether are quite small. When the firms are divided into to subcategories by the amount of total assets that they employ, the totals in panel B and panel C indicate that the smaller firms use trade credit slightly more than the larger firms do.

[TABLE 4 HERE]

The data are further divided to reflect differences in trade credit usage by firm size, age and the size of the largest bank owner's equity stake in TABLE 5. Size does not seem to be a very important determinant of trade credit usage, although the firms in the smallest quartile seem to use trade credit slightly more than the average firm. The youngest firms seem to stretch out their payments more than the older firms do. Finally, the firms in which the largest bank owner holds between one and five percent of equity seem to rely less on accounts payable as a source of funds, and it seems that the days payables outstanding increases with bank ownership. This could be interpreted to mean that the higher the largest owner bank's equity claim is, the more financially constrained the firm will be.

[TABLE 5 HERE]

**The Effect of Relationships on Credit Availability.** When I examine credit availability by using an indirect measure such as the level of trade credit used there are a number of things that need controlling for before I can draw any conclusions between relationship effects and debt availability in general. The variables used in the regressions can be broken down to variables measuring the supply of trade credit, corporate financial characteristics measuring corporate demand for capital, corporate financial characteristics measuring the supply side of capital, relationship characteristics and industry characteristics.

Since there is no cost to accepting trade credit (at least until the discount date), the fraction actually purchased on account is relatively close to the fraction that is offered on account.<sup>iv</sup> This is the amount of credit voluntarily offered by suppliers. In the case of relatively large, listed firms, it is in my opinion relatively safe to argue that the purchases to assets ratio can be used as a proxy for the amount purchased on credit. The firm's purchases normalized by the value of book assets will therefore be used as a measure of the trade credit that it is supplied. When this variable is regressed against the accounts payable to assets ratio in column 1, TABLE 6, we can see that the coefficient estimate of 0.03 is economically large and statistically significant. This coefficient implies that an increase in the purchases to assets ratio from 0 to the median of 0.37 increases the firm's stock of accounts payable by about 1.1 percent of assets.

[TABLE 6 HERE]

The corporate financial characteristics measuring the firm's demand for capital include measures for investment opportunities and asset maturity. Firms that are growing more quickly are proposed to have more investment opportunities. A proxy for this is the change in sales scaled by assets. Because the underlying relationship between the firms' demand for credit and sales growth is non-linear<sup>v</sup>, I have divided this variable into two separate variables. The first one stands for positive changes in sales and second one for negative changes in sales. Increases in sales raise the firms' demand for trade credit. Each additional Finnish Markka of sales increases the demand for trade credit by 0.4 pennies. To put this number in perspective, a firm's purchases average 59 percent of sales in this sample. So firms finance about 0.7 percent of this with trade credit. However, since trade credit is short-term credit, we should recalculate this percent based on monthly sales increasing by one currency unit. This being the case, firms finance about 14 percent of their increased purchases with trade credit. The coefficient on sales declines is negative, but nonsignificant. As an additional measure of the firms' demand for capital, investment opportunities are typically thought to decline with firm size in samples of large firms. Contrary to expectations, the estimates in TABLE 6 indicate that firm size is positively correlated with the firm's accounts payable.

An obvious measure of a firm's demand for short term financing is its short-term assets. This is because the rational firm should not finance long term projects with trade credit; rather, most firms match the maturity of assets and liabilities. The rational for this is presented by, e.g., Diamond (1991), and Hart and Moore (1991). Firms whose assets consist mainly of current assets should thus demand significantly more trade credit. From TABLE 6 we can see that at the margin 11 percent of the firm's current assets are financed with trade credit.

Having controlled for the availability of trade credit, the firms' investment opportunities, and the maturity of its assets, I now turn to investigate whether the firm's liquidity position and availability of credit from other sources affect its demand for trade credit. I find that the firm's ability to generate cash internally does not have a significant effect on trade credit usage. An increase in profitability will however increase the probability that the firm will stretch its payables more than the average firm will in the same industry. Finally, a listing at the Helsinki Stock Exchange, which presumably enhances availability of outside funding, does not have a significant effect on trade credit usage.

The relationship variables that measure the availability of finance from financial institutions consist of two variables measuring the strength and existence of bank-borrower relationships. The variable Age refers to the number of years the firm has been in existence. The purpose of this variable is to capture the ability of the bank to learn more about the borrowing firm through its relationship with the borrower. The impact of age can however be expected to decline with time. I use a log transformation of  $\log(1+\text{age})$  to take into account this possibility. This variable (and also the log transformation) has been previously used as a measure of lending relationships in a number of studies, e.g., Boot and Thakor (1994), Berger and Udell (1995), Petersen and Rajan (1994, 1995), and Keasey and Watson (1995). These studies predict that the longer a firm has been in existence, the more capital it will have access to. The regression coefficient on this variable is nonsignificant and negative in columns 1 and 2, but takes a statistically significant and positive coefficient in column 3<sup>vi</sup>. This result indicates that the older the firm is, the more likely it is to stretch the payment of its accounts payable.

This study is the first one to measure directly the relationship effects of bank ownership of corporate equity on corporate loan availability. Like described above, several studies, e.g., Petersen and Rajan (1994, 1995), Mayer (1988) and Berlin, John and Saunders (1993, 1996) have suggested that bank equity claims in the borrowing firms may enhance loan availability<sup>vii</sup>. I use two alternative specifications for the variable measuring the importance of bank equity claims. The first one is a continuous variable, which indicates the largest bank owner's share of the firm's total votes. To take into account the possibility of a nonlinear relationship, I also include a quadratic formulation of the votes variable. The coefficients for these two variables in column 1, TABLE 6 are both highly statistically significant and indicate that while increases in bank equity claims initially decrease trade credit usage, this effect is reversed for higher levels of bank equity claims.

An alternative treatment of the bank equity claim variable is suggested by Berlin, John and Saunders (1993) and a related literature on the impact of management equity ownership, [e.g., Morck, Schleifer

and Vishny (1988), and McConnell and Servaes (1990)]. The Berlin, John and Saunders (1993) model suggest that the owner bank will limit its own supply of credit, when its equity claim is small, and that outside creditors will limit their credit supply when the bank's equity claim is large. The breakpoints of 5 and 20 percent are drawn from the management equity ownership literature and the 10 percent is added because Finnish banks are legally restricted to this maximum. Based on the results in column 2, TABLE 6 it seems evident that the firms, in which the largest owner bank holds between 5 and 20 percent of total equity, use less trade credit. This effect is most significant for equity claims between 5 and 10 percent.

The Probit regression in column 3, TABLE 6 investigate trade credit usage by introducing an alternative dependent variable, that is, a dummy variable which takes the value of 1 the Days Payables Outstanding (DPO) for the firm is above industry median. This specification is included to take into account the possibility that part of the demand induced variation in trade credit usage is not captured by the control variables. Based on the results for this regression model we can see that the firms in which the largest owner bank holds small equity claims (below 5 percent) or large equity claims (more than 10 percent) stretch their payments more than the firms in which no bank holds equity. Also, the firms in which the largest owner bank holds between 5 and 10 percent of equity stretch their payments less than the firms in which no bank holds equity do. The results in column 3 can be interpreted to indicate that the firms in which the largest owner bank holds some equity (but less than 5 percent), and the firms in which the largest owner bank holds more than 10 percent of equity are more financially constrained than the firms in which no bank holds equity. And also, the firms in which the largest owner bank holds between 5 and 10 percent of equity are less financially constrained than the firms in which no bank holds equity.

The industry variables are included in the regressions to control for industry specific differences in trade credit practices and investment opportunities. Based on the estimates in TABLE 6 these differences are significant. Finally, the year dummies are included to control for changes in macroeconomic conditions. When 1991 is set to be the reference year, the results suggest that trade credit usage was higher between 1985 and 1988.

## Discussion and Conclusion

This study examines the role that bank equity claims in borrowing firms have on debt availability to the firm by using data on listed Finnish firms during 1985 through 1991. The results suggest that allowing banks to hold equity claims in borrowing firms enhance debt availability to the firm if the bank's equity claim is neither very small nor very large. The results are to some extent consistent with arguments that equity

claims may be helpful in transferring the benefits of an ongoing relationships to the borrowers, and thus eventually also enhance investment efficiency in the economy as a whole. The results, however, also suggest that small bank equity claims in borrowing firms do not have this impact. Rather, there is some evidence to indicate that firms in which a bank holds a very small equity claim are more financially constrained than the firms in which no bank holds equity are. Similarly, the results also suggest that firms in which a bank holds a fairly large equity claim are more financially constrained than the firms in which no bank holds equity are.

Previous empirical studies on relationship lending use small, mostly untraded firms for which the bank-borrower relationship is likely to be important. This study expands their scope by concentrating on large, listed corporations that have direct access to both domestic and international financial markets. Previous studies and conventional wisdom suggests that these firms are not expected to benefit from close banking relationships. The results from this study contradict these beliefs in that relationships seem to count for large listed firms as well.

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## Appendices

**Table 1.** Definition of Variables

Variable	Definition of variable
Log (Total Assets)	Log of total book assets of the firm
Debt to assets	The ratio of debt to total book assets
Debt from financial institutions to assets	The ratio of debt from financial institutions to total book assets
Coverage ratio	The interest rate coverage ratio - Interest expenses/profits
Profit to assets	The ratio of profit before taxes to total book assets
Quick ratio	Current assets/current liabilities
Firm age	Firm age at the beginning of each year
Accounts payable to total debt	The ratio of accounts payable to total debt
Helsinki Stock Exchange listing dummy	A dummy variable, which takes the value of one if the firm, is listed at the Helsinki Stock Exchange as opposed to the OTC-list or the Stockbrokers list.
Largest owner bank's share of total votes	The percentage that the largest owner bank holds of total corporate voting power.
The largest owner bank's share of votes 0.01-4.99	A dummy variable for the largest owner bank's share of corporate voting power. Takes the value of one if it fall between 0.01 % and 4.99 %.
The largest owner bank's share of votes 5.00-9.99	A dummy variable for the largest owner bank's share of corporate voting power. Takes the value of one if it fall between 5.00 % and 9.99 %.
The largest owner bank's share of votes 10.00-19.99	A dummy variable for the largest owner bank's share of corporate voting power. Takes the value of one if it fall between 10.00 % and 19.99 %.
The largest owner bank's share of votes > 20.00	A dummy variable for the largest owner bank's share of corporate voting power. Takes the value of one if it exceeds 20.00 %.
Industry dummy for the retail industry	A dummy variable for the firms in the retail industry
Industry dummy for other service industries	A dummy variable for the firms in other service industries
Industry dummy for the steel industry	A dummy variable for the firms in the steel industry
Industry dummy for the forest industry	A dummy variable for the firms in the forest industry

**Table 2.** Descriptive Statistics

Variable	Mean	Std.dev.
Total Assets	3158.7	4214.6
Debt to assets	0.70	0.84
Debt from financial institutions to assets	0.19	0.22
Accounts payable to total assets	0.11	0.10
Accounts payable to sales	0.10	0.24
Days payables outstanding	78	81
Purchases to assets	0.57	0.77
Profit to assets	0.09	0.09
Quick ratio	1.42	1.00
$\Delta$ Sales / Assets, if positive.	0.37	2.82
$\Delta$ Sales / Assets, if negative.	-0.03	0.08
Current assets / Total Assets	0.74	1.05
Largest owner bank's share of total votes	5.32	11.89
Firm age	75.2	57.9

**Table 3.** Debt from financial institutions and bank equity claims

Estimated coefficients from regressing the debt from financial institutions to assets ratios against a set of relationship variables as well as firm specific control variables. The absolute values that have been used in developing the variables have been inflation adjusted using the Finnish consumer price index. The results have been corrected for heteroscedasticity.

Variable	1	2
Intercept	0.25*** (0.000)	0.27** (0.000)
<i>Relationship characteristics</i>		
Ln(1+age)	-0.04** (0.027)	-0.03** (0.039)
Votes	-0.004** (0.024)	
(Votes) <sup>2</sup>	0.0007*** (0.006)	
Largest owner bank's equity stake 0.01-5.00%		-0.008 (0.758)
Largest owner bank's equity stake 5.01-10.00%		-0.07*** (0.000)
Largest owner bank's equity stake 10.01-20.00%		-0.05** (0.011)
Largest owner bank's equity stake >20.00		0.003 (0.947)
<i>Firm characteristics</i>		
Ln(total assets)	0.02*** (0.006)	0.02*** (0.007)
Profit to assets	-0.68*** (0.000)	-0.70*** (0.000)
Quick ratio	-0.01 (0.228)	-0.01 (0.195)
<i>Industry dummies</i>		
Retail	-0.08*** (0.001)	-0.07*** (0.003)
Other services	-0.05** (0.021)	-0.05*** (0.003)
Steel	-0.02 (0.585)	-0.02 (0.485)
Forest	0.03 (0.547)	0.03 (0.525)
<i>Year dummies</i>		
Year 1985	0.02 (0.449)	0.01 (0.586)
Year 1986	0.13 (0.201)	0.11 (0.249)
Year 1987	0.02 (0.326)	0.01 (0.554)
Year 1988	0.01 (0.639)	0.003 (0.911)
Year 1989	0.005 (0.802)	-0.0008 (0.969)
Year 1990	-0.002 (0.904)	-0.005 (0.779)
Adjusted R <sup>2</sup>	0.11	0.10
F	3.5	3.35
Probability	(0.000)	(0.000)
N	359	359

**Table 4.** Accounts payable and days payables outstanding ratios

Panel A: All firms								
Industry	Accounts payable/sales (%)				Days payables outstanding			
	Mean	Median	Min	Max	Mean	Median	Min	Max
Retail	8.22	7.57	3.47	19.96	64	56	33	174
Other services	8.44	7.54	1.86	23.43	87	79	45	288
Steel	9.33	8.31	1.27	36.10	73	66	40	304
Forest	7.16	6.31	2.04	15.59	72	79	36	93
Manufacturing	8.61	8.01	1.09	25.87	68	64	9	203
Total	8.54	7.80	1.09	36.10	70	65	0	304

Panel B: Small firms								
Industry	Accounts payable /sales (%)				Days payables outstanding			
	Mean	Median	Min	Max	Mean	Median	Min	Max
Retail	8.12	8.45	3.92	13.84	72	60	33	174
Other services	8.77	7.97	1.86	22.66	91	81	15	288
Steel	8.15	7.42	1.27	17.40	86	69	40	304
Forest	7.98	7.52	5.33	11.53	74	78	55	89
Manufacturing	8.51	7.90	1.09	25.48	68	63	24	203
Total	8.48	7.90	1.09	25.48	72	67	0	304

Panel C: Large firms								
Industry	Accounts payable /sales (%)				Days payables outstanding			
	Mean	Median	Min	Max	Mean	Median	Min	Max
Retail	8.33	6.68	3.47	19.96	49	55	34	69
Other services	7.96	6.62	3.59	23.43	79	69	28	143
Steel	9.94	8.49	3.38	36.10	68	65	46	96
Forest	6.99	6.31	2.04	15.59	72	80	36	93
Manufacturing	8.72	8.10	1.82	25.87	67	65	9	138
Total	8.60	7.72	1.82	36.10	68	64	0	246

**Table 5.** Trade credit used by firms: by size, age, and the largest owner bank's equity stake.

Panel A: Trade credit used by firm size					
Book value of Assets (million FIM)	Asset percentile	Accounts payable/sales (%)		Days payables outstanding	
		Mean	Standard deviation	Mean	Standard deviation
Less than 360	0-25	8.10	4.20	75	48
360-1500	25-50	7.60	4.50	69	40
1501-4500	50-75	7.80	4.80	74	75
Over 4500	75-100	7.70	3.67	71	28

Panel B: Trade credit used by firm age					
Firm age	Asset percentile	Accounts payable/sales (%)		Days payables outstanding	
		Mean	Standard deviation	Mean	Standard deviation
Less than 36	0-25	8.00	4.36	84	88
36-70	25-50	7.50	4.12	68	39
71-95	50-75	8.20	5.26	70	31
Over 96	75-100	7.60	3.21	67	20

Panel C: Trade credit used by the largest owner bank's equity stake

Size of the Largest owner bank's equity stake (%)	Asset percentile	Accounts payable/sales (%)		Days payables outstanding	
		Mean	Standard deviation	Mean	Standard deviation
Less than 0.05	0-25	8.10	3.70	64	47
0.06-0.99	25-50	8.10	4.70	70	27
1.00-5.40	50-75	6.80	4.14	73	35
Over 5.40	75-100	7.80	3.36	80	78

**Table 6.** Trade credit and bank equity claims

Estimated coefficients from regressing the accounts receivable to total assets ratio in columns 1 and 2 and A dummy variable which takes the value of one if days payables outstanding (DPO) is above industry median in column 3. Pseudo  $R^2$  is computed as  $1 - \ln L(\Omega) / \ln L(\omega)$ , where  $\ln L(\Omega)$  is the value of the likelihood function evaluated at the maximum likelihood estimates and  $\ln L(\omega)$  is the maximum value of the likelihood function under the hypothesis that all independent variables equal zero. The absolute values that have been used in developing the variables have been inflation adjusted using the Finnish consumer price index. The results have been corrected for heteroscedasticity.

Variable	1	2	3
Intercept	-0.04 (0.114)	-0.03 (0.294)	-1.63 (0.004)***
<i>Relationship characteristics</i>			
Log (1+age)	-0.007 (0.130)	-0.006 (0.176)	0.23 (0.026)**
Largest bank owner's equity stake	-0.002 (0.000)***		
(Largest bank owner's equity stake) <sup>2</sup>	0.00002 (0.002)***		
Largest owner bank's equity stake 0.01-5.00 %		0.002 (0.766)	0.33 (0.059)*
Largest owner bank's equity stake 5.01-10.00 %		-0.06 (0.000)***	-0.53 (0.083)*
Largest owner bank's equity stake 10.01-20.00%		-0.02 (0.034)**	0.54 (0.043)**
Largest owner bank's equity stake over 20 %		0.01 (0.274)	0.75 (0.047)**
<i>Firm characteristics</i>			
Purchases / assets	0.03 (0.047)**	0.04 (0.013)**	-0.48 (0.000)***
$\Delta$ Sales /assets if positive, zero otherwise	0.004 (0.004)***	0.003 (0.027)**	0.37 (0.328)
$\Delta$ Sales / assets if negative, zero otherwise	-0.03 (0.593)	-0.03 (0.644)	-0.48 (0.686)
Log (book value of assets)	0.006 (0.026)**	0.005 (0.060)*	-0.001 (0.814)
Current assets / assets	0.11 (0.000)***	0.09 (0.000)***	0.29 (0.218)
Profit to assets	0.06 (0.413)	0.06 (0.408)	3.01 (0.027)**
Firm listed at the HSE	0.006 (0.491)	0.008 (0.332)	-0.03 (0.843)

Table 6 continues...

<i>Industry dummies</i>			
Retail	0.16 (0.000)***	0.16 (0.000)***	
Other services	0.04 (0.000)***	0.04 (0.000)***	
Steel	-0.01 (0.073)*	-0.01 (0.120)	
Forest	0.02 (0.075)*	0.02 (0.070)*	
<i>Year dummies</i>			
Year 1985	0.04 (0.036)**	0.04 (0.026)**	-0.08 (0.840)
Year 1986	0.03 (0.031)**	0.03 (0.042)**	-0.09 (0.766)
Year 1987	0.02 (0.099)*	0.01 (0.199)	-0.11 (0.692)
Year 1988	0.02 (0.167)	0.01 (0.228)	0.37 (0.194)
Year 1989	0.008 (0.521)	0.004 (0.734)	0.02 (0.947)
Year 1990	0.004 (0.703)	0.001 (0.923)	0.40 (0.114)
Adjusted R <sup>2</sup>	0.60	0.62	
Pseudo R <sup>2</sup>			0.12
F	27.50	27.43	
$\chi^2$			52.54
Probability	(0.000)	(0.000)	(0.000)
N	359	359	323

<sup>i</sup> E.g. Diamond (1984), Ramakrishnan and Thakor (1984), and Boyd and Prescott (1986).

<sup>ii</sup> This literature includes studies by, e.g., Mikkelsen and Partch (1986), James (1987), Slovin, Sushka, and Hudson (1988), Lummer and McConnell (1989), and Hirschey, Slovin, and Zaima (1990).

<sup>iii</sup> Although not reported here I also run the regressions with two alternative dependent variables, that is, total debt to total assets, and debt from financial institutions to total debt. The results are qualitatively similar to the ones reported here.

<sup>iv</sup> The literature dealing with the decision to supply trade credit is fairly substantial. Mian and Smith (1992), and Frank and Maksimovic (2005) provide comprehensive reviews of this literature.

<sup>v</sup> This treatment of the change in sales variable is suggested in Petersen and Rajan (1997).

<sup>vi</sup> While investment opportunities are commonly perceived to decline with firm age, it could be argued that age proxies for investment opportunities. The positive relationship between firm age and above industry average payment periods does not however support this proposition.

<sup>vii</sup> A number of studies using Japanese data have investigated the role of bank equity claims indirectly, by using measures such as a relationship with a main bank (who usually hold some amount of equity in the firms) or the fact that the firm belongs to a group that centers around a specific bank (Keiretsu). While these studies have generally concluded that close bank-borrower relationships increase debt availability to the firm (measured by leverage), they have not used bank equity claims as a direct measure.