

## **Do credit rating incorporate firms' risk management?**

### **Abstract**

This study investigates the relation between firm risks and credit rating for a larger sample of US-firms over the period 2005-2010. The information risk is related to the degradation of the results of the firm, for example the impossibility to honour his debts, his productivity, his quality of management, his losses, his deterioration of assets or his taxes. Therefore in our research, we distinguish between multiple factors linked to firm's risk: the market risk, financial risk, accounting quality, corporate governance, taxes and pension and we analyze the impact of these variables on the credit rating level.

The results of the rating likelihood models indicate that rating level is dependant of a company's financial risk.

**Keywords:** *credit rating, credit risk, firm's risk.*

## **1.Introduction**

Since the different debacle related credit crisis, the quality of credit rating is criticized about potential loss of reputation by the lack of incentives to respond to the needs of credit rating users. Shortening the information collected by firms could react to new information (information revealed in daily stock prices) and can affect rating changes followed by higher selection adverse.

For most researchers, agencies have privileged access to information on companies' capacity to make profits, according to Holthausen and Leftwich (1986), the information given by the agencies are not published but integrated into their ratings. Ederington, Yawitz and Roberts (1987), Nayar and Rozeff (1994), confirm this idea that there is information little-known to credit analysts and confidential. In this case, it is likely that the market will have already integrated an improvement in rating on the basis of previously published positive information into its valuation (Klinger and Sarig, 2000). But the reaction of prices to rating changes is asymmetrical that is to say, the market reacts more strongly when the rating falls compared to a stable rating or an increase, and this asymmetry seems significant (Vassalou and Xing, 2003).

Despite Section 702 of Sarbanes-Oxley Act (July 25, 2002) "conducted a study if the role and function of credit rating agencies in the operation of securities markets", academic research (Dichev, 1998; Cantor and Packer, 1997; Kisgen, 2007) show that credit rating information have been referred to by different financial variables which evaluate the credit risk of the firm.

Also, Bhojraj and Sengupta (2003), Kraft (2007), Altamuro (2009) argue that corporate governance mechanisms can decrease agence risk throughout for example, control of the board or institutional ownership. Kisgen (2007) demonstrate the relation between credit ratings, leverage and equity return volatilities by financial risk variables. Following the nature of the rating change (downgrade), the net debt relative to net equity can be reduced in the firm. Fama and French (2002) Ganguin and Bilardello (2005), Dechow *et al.* (2010) and Poon (2005) analyze accounting disclosure variables (free cash flow) associated with poorer credit rating and higher spread.

The objective of this research is to determine if firm's risk affect credit rating level. Can firm risk limit a company's credit quality? One contribution of this paper is to underline the risk of the firm using information from the debt crisis.

This paper is organized as follows: section 2 reviews the literature and presents framework. Section 3 presents hypothesis around firms' risk and credit rating level. Section 4 discusses the research methodology. Section 5 the sample we used. Section 6 empirical findings.

## **2. Literature review**

Theory distinguishes among sources of information risk like discretionary accruals (Subramanyam, 1996) which may have distinct cost of capital effects. In addition, other

information risk measures are employed in prior studies. Our paper builds on theoretical research around different risk which may affect rating changes. Most risks are:

#### *Information in market risk*

The Basle Committee defines market risk as “the risk of losses in on-and off-balance sheet positions arising from movements in market prices”. The market is captive and it exists an explicit link between book-to-market and financial distress. In effect, Fama and French (1992) use market capitalizations and book-to-market equity ratios to explicate cross-sectional variation on market returns. They introduce firms-specific information specifically the idiosyncratic risk which reflects the volatility of the market. Strong idiosyncratic risk firms tend to be dependant with the least liquidity.

#### *Information in financial risk*

The mode of financing of the operation has an effect on the financial structure of the company at the origin of the operation. A review of the literature allows us to emphasize elements such as the size, the perspective of growth, the risk of long term debt, the form of the offer, the risk of bankruptcy by the rating. Thus, capital structure influence rating change. High asset and investment in working capital increase rating change (Sufi, 2009). Altamuro (2009) argue that larger companies are more expand than smaller firms to get a credit rating due to their good reputation and diversification.

Cantor and Packer (1999), Pottier (1997) contend that higher the profits, lower the likelihood of financial distress and default and higher motive firms to have a rating. So rating can influence the business of the firm (by supply contract). Subsequently, information in financial risk throughout indicators like asset quality, liquidity, reserves for losses or capital adequacy can directly influence the decisions of firms at financing (Kisgen, 2006, 2007).

#### *Information in accounting quality*

Ganguin (2005) results that profitability and quality of the assets influence credit rating. Financial information affects rating positively with accrual quality measure per Dechow et al. (CAR, 2010). Poor accruals quality increases the risk of the firm and the equity cost of capital. Others researches show that accrual qualities affects also the cost of debt by leverage or return on assets indicators. Poon (2005), Adams (2003) argue also that financial distress brought about by leverage, high leveraged firms are less to solicit a rating. Kisgen (2006, 2007) confirms that ratings react differently to the leverage with lowering leverage after downgrade due to the decision of capital structure of the firm. For example, firms which practice R&D activities reduce their risk of debt significantly.

#### *Information in corporate governance*

Corporate governance can impact the quality of rating by controlling agency costs. Bhojraj and Sengupta (2003) confirms that corporate governance can reduce agency risk and information risk. Therefore, the credit rating can reflect the satisfaction of financial stakeholder rights and ownership. Firms with stronger rights have lower credit rating and could also impact free cash flow. Among the theory of the free cash flow (Jensen, 1986) firms with weaker governance will have more debt due to the interest cost and the lower level of credit rating.

*Information in taxes and pensions*

Altamuro (2009) examine the use of operating lease information in credit rating which incorporate off-balance sheet lease. In effect, the level of operating leases is positively associated with financial ratios for credit ratings due to their capitalization and their different treatment in banks (SFAS 13).

Study	Variable	Definition	Hypothesis	Data
	<b>Characteristic firms</b>			
<b>Adams (2003) Altamuro et al. (2009)</b>	Size	Logarithm of total assets	Larger companies are more likely to be diversified in their risk. Bigger companies have good reputation and more likely get CR.	6439 firm-years during 2000-2005 with CR 2535 loan deals (1372 S&P) during 2000-2005
<b>Poon and Firth (2005)</b>	Profitability	Profit margin: ROA	Solicited rating boast higher profit margins higher rates of return of assets	1060 bank ratings of major banks from 82 countries
<b>Pottier and Sommer (1999) Adams et al. (2003)</b>	Solvency	Leverage ratio: Long term debt/long debt +common equity	Raising debt capital is a significant determinant to obtain rating	1678 property liability insurers. CR (296 S&P, 170 Moody's, 1510 Best)
<b>Dichev (1998) Cantor and Packer(1997)</b>	Default risk	Ratio of book value of common equity to market value of equity: BTM	Companies with high BTM are solicited a rating (bankruptcy is incorporated in systematic risk)	1137 US firms rated by Moody's and S&P
	<b>Firm risks</b>			
<b>Adams et al. (2003)</b>	Business risks	Indicator of the Riskiness of the sector	Higher profitability is related to lower insolvency risk	1993-1997 insurance firms in UK.
<b>Ayers et al. (2010) Francis et al (2005) Dechow and Dichev (2002)</b>	Accruals quality	Decile rank of AQ	CR decline with firm information risk represented by accruals quality.	3132 firms year observations 1994-2004
	<b>Corporate governance</b>			
<b>Ayers et al. (2010)</b>	Credit facilities Future pension Tax plan	Variable Tax Pension	Negative association between positive changes in book tax and CR changes.	3132 firms year observations 1994-2004
	<b>Rating</b>			
<b>Kisgen (2007) Pettit (2004)</b>	Up/downgrade	Dummy variables	Change in credit rating affect the cost of debt	CR 1987 -2003
<b>Ayers et al. (2010)</b>	Rating change	Rating Change from year t to t+1	Positive changes in book-tax differences and likelihood of CR	3132 firms year observations 1994-2004

### 3.Hypothesis development

To examine whether the risk of the firm influence credit rating, we investigate the management information typically focused on various ratios, such as interest coverage, long-term debt to total assets, profitability ratios which can affect directly and indirectly ratings (Ziebart and Rieter, 1992). We deduce that more the firm is riskier (risk of loss) more the rating is lower, our first hypothesis stated in the alternative is:

*Hypothesis 1: Ceteris paribus*, there is a positive association between a firms' risk management strategy and its credit rating level.

Francis et al. (2005) reveal that credit ratings are correlated with some accrual quality variables. In effect, low level of rating can reveal a signal of decreased earnings quality of the firm. The diversifiability of information risk (Liu, 2007) like earnings or tax management may be negative information for credit rating.

Subsequently, higher quality earnings provide more information about the performance of the firm.

The second hypothesis of this study posits that:

*Hypothesis 2: Ceteris paribus*, there is a negative association between a firms' risk profile, its propensity to engage in earnings management and its credit rating level.

The main studies in the area of credit rating are presented table 4 will be used to test hypothesis.

### 4.Methodology

#### A. The sample

We studied 112 S&P rated, US listed and non financial issuer from 2005 to 2010 collected from Compustat. We analyzed 672 credit changes during three periods: pre-crash (2005-2006), crash (2007-2008) and post-crash (2009-2010). All data information was collected by Compustat.

Table 2 provides descriptive statistics of our sample of 672 rating changes during three periods, the percentage of different rating changes show that there are more downgrade (11%) and upgrade (9%) during period crash and a gap after crash, respectively 7% and 5%. The rating level reveals that the majority of the sample (62%) is in category investment grade (A).

For purposes of this analysis, we hold the firm characteristic variables (ROA, SIZE, LEV...) constant at the mean values for the sample and subsample. Concerning the mean of these indicators, we find in general less gains, cash flow and sale financial instrument reserve of firms during crisis rather than over period.

## B. The variables

To test the empirical implications described in section 3, we need to determinate the impact of firm's risk variable on credit rating. Variables included in our research are defined in table 2. The statistic distribution of these variable are summarize in table 3.

- *Dependant variable*

The dependant variables are the rating level from AAA to CCC as numerical value.

**Rating (ratinglevel):** We use the rating level 1 as our main measure which is defined as a score calculated for every notch below AAA+, the rating level 2 is a dummy variable reflected the category of the rating (1 for speculative grade, 0 for investment grade).

- *Measure of market risk:*

**Idiosyncratic risk (IDIORISK):** calculated by  $LN(1-r^2)/r^2$ . Ferreira and Laux (JF, 2007) used this relationship to analyze of governance to idiosyncratic risk, specifically board independence and stock price informativeness. By definition, this variable is independent of the market. Ang, Hodrick, Xing and Zhang (2008) find negative association between average return and idiosyncratic volatility.

**Bêta:** systematic risk of the firm calculated using daily stock over period t. It would be associated negatively with rating. Studies show that firm size has effects on cross-sectional returns in particular with book-to-market.

**Book-to-market (MTB):** ratio of book to market value of equity calculated similar to the Fama and French (1992)'s procedure. Firm with high ratio could be associated with high risk and negative rating.

- *Measure of financial risk:*

**Earnings (earn):** designed by return on equity as we see in introduction, the rating influence the common stock prices and more with downgrade which generate or not income for common stockholders.

**Return on assets (ROA) and Standard deviation of return of assets (sdROA):** calculated using 5 years. This ratio motivates efficient management of the firm by the utilization of asset.

**Operating cash flow (CFO):** there are two cash flow ratios funds from operations relative to debt and free operating cash flow relative to debt.

**Interest coverage (intcov):** calculated as operating income before depreciation and interest expense, high earnings margins signify to the firm to generate cash so to minimize risk and to have better rating (Amato, 2004). A firm with problems of liquidity may be to default on current obligations.

**Leverage (LEV):** designed book value of liabilities to market value of equity. It tends to reduce free cash flow (Jensen, 1986) but an excess of debt can increase the capacity of bankruptcy and can reduce the rating.

**Capital intensity (capint):** calculated as property, plant and equipment net of depreciation deflated by total assets, strategic planning is critical for capital intensive

firms and can affect performance of the firm (difficulty of provision of capital asset requirement) (Kukalis, 1991).

- *Measure of risk of management:*

Different level of reserves could influence rating. We define several measures within each category of variables.

**Reserves (CIOTH):** a firm which tends to view reserves positively is perceived as a favorable to receive lines so could influence positively the evaluation of credit rating agencies.

**Cash flow derivative reserve (CIDERGL):** reserve can supply funds to leverage state and provide cash flow until major revenues. The level of reserve could predicate the vulnerability of revenues.

**Sale financial instrument reserve (CISEC):** total balance includes sometimes reserves for encumbrances, inventories and expenditures which tend to influence wildly fluctuations.

**Currency translation reserve (CICURR):** are not recognized under the narrow concept of income because the exchange rate may change before the exchange losses or gains are realized (SFAS, 52). Subramanyam and al. (1999) find no evidence correlation between this ratio and value relevant.

**Opening comprehensive income (CIBEGNI):** gains and losses would be recognized under a definition of income because the subsidiary's net assets can be calculated dependably.

- *Measure of corporate governance:*

**Core earnings (SPCE):** this measure substitutes faire value pension expense for the smoothed expense reported by US GAAP method. We expect an impact of pension deficit in debt rating.

**Stock option expense (STKCO):** excessive use of stock options can affect negatively pension fund value.

- *Measure of tax and pension:*

**Pension reserve (CIPEN):** convenient source of long term financing. Pension reserve could strain liquidity. If pension risk level increases, they are a contributing factor in the downgrades; the pension-ability will be viewed as debt-like.

## 5. Empirical result

Table 4 presents Pearson correlations. We do observe significant correlations between ratings level and ratios. The correlation between Ratinglevel and disclosure variables MTB are negative suggesting higher quality disclosures are related to lower credit ratings.

The accounting of based ratios of return-on-assets (ROA), and cash flow (CFO) are used to proxy for firms' default risk, where lower ROA and CFO values reflects greater



default risk (with p-value<0.01). Firm's cash flow may influence the level of rating and risk measure.

Specifically, as we predicted H1, we find that ROA, MTB, CIBEGNI, STKCO, CFO and SPCE are significantly negatively with credit rating level interpreted by credit rating analyst as higher credit risk of the firm. A significant and negative association is observed between RATINGLEV and ROA (with p-value<0.01) which indicates that firms with better performance are in lower risk.

We test the effect of firm risk characteristics on rating level using the general model:

$$\text{Ratinglevel}_{it} = \alpha + \beta_1 \text{DsdROA}_{it} + \beta_2 \text{DIDIORISK}_{it} + \beta_3 \text{DCIOTH}_{it} + \beta_4 \text{DCIDERGL}_{it} + \beta_5 \text{DIBETA}_{it} + \beta_6 \text{DPNCA}_{it} + \beta_7 \text{DMTB}_{it} + \beta_8 \text{DCISEC}_{it} + \beta_9 \text{Dearn}_{it} + \beta_{10} \text{DVAR}_{it} + \beta_{11} \text{DCIBEGNI}_{it} + \beta_{12} \text{DCICURR}_{it} + \beta_{13} \text{DROA}_{it} + \beta_{14} \text{DSTKCO}_{it} + \beta_{15} \text{DCFO}_{it} + \beta_{16} \text{Dintcov}_{it} + \beta_{17} \text{DSPCE}_{it} + \beta_{18} \text{DCIPEN}_{it} + \beta_{19} \text{DLEV}_{it} + \beta_{20} \text{Dcapint}_{it} + \varepsilon_{it}$$

We can summary variables following this equation:

$$\text{Ratinglevel}_{it} = \alpha + \beta_1 \text{Market risk}_{it} + \beta_2 \text{Financial risk}_{it} + \beta_3 \text{Risk of management}_{it} + \beta_4 \text{corporate governance}_{it} + \beta_5 \text{Tax and pension}_{it} + \varepsilon_{it}$$

In statistical tests of correlation, we found in table 6 bis, a general trend of increased statistical and significance during period crisis for variables DCIDERGL, DPNCA, DEARN, DSTKCO and DCIPEN. Further, loss (DCIBERGNI) is considered to have higher risk, the coefficient of this variable is significant and positive (with p-value<0.05). Further, variables DEARN and DSTKCO are significant and positive (with p-value< 0.01) and show that agency problem between shareholders and bondholders may be mitigated. A higher level of stock option choose risky investment project, so credit rating adjust grants. The increase of DCIPEN variable is viewed as being credit positive which is confirmed in Table 7 by influencing pension interest cost.

The positive coefficient on DsdROA before subcrisis and Diodirisk after the period suggest that increasing managerial risk profile of the firm reduce the probability to receive an investment grade.

After, we estimate a regression model with credit ratings as the dependant variable and the disclosure variables. We estimate the following logistic model:

$$\text{Prob}(\text{Ratingchange} \geq i) = \Phi(\alpha_1 \text{DsdROA}_{it} + \alpha_2 \text{DIDIORISK}_{it} + \alpha_3 \text{DCIOTH}_{it} + \alpha_4 \text{DCIDERGL}_{it} + \alpha_5 \text{DIBETA}_{it} + \alpha_6 \text{DPNCA}_{it} + \alpha_7 \text{DMTB}_{it} + \alpha_8 \text{DCISEC}_{it} + \alpha_9 \text{Dearn}_{it} + \alpha_{10} \text{DVAR}_{it} + \alpha_{11} \text{DCIBEGNI}_{it} + \alpha_{12} \text{DCICURR}_{it} + \alpha_{13} \text{DROA}_{it} + \alpha_{14} \text{DSTKCO}_{it} + \alpha_{15} \text{DCFO}_{it} + \alpha_{16} \text{Dintcov}_{it} + \alpha_{17} \text{DSPCE}_{it} + \alpha_{18} \text{DCIPEN}_{it} + \alpha_{19} \text{DLEV}_{it} + \alpha_{20} \text{Dcapint}_{it} + v_{it})$$

With the logistic function represented as follow:  $e^{\beta^x} / (1 + e^{\beta^x})$

In table 7, when Downgrade is used as the dependant variable, we find a positive relation between downgrade (DOWN) and leverage (LEV) as we predicted and a

negative association between downgrade and (CAPINT) (with  $p\text{-value} < 0.05$ ). A downgrade predicts a decrease of leverage because of a higher cost of debt.

## **6. Conclusion**

The paper explores the link between firm risk and rating level. We see that ratings level enclose information about cash flow risk – default likelihood and expected recovery – but nothing about systematic risk exposure.

Finally, firms with higher profitability will be granting more to their management profile and stimulate risk (with  $p\text{-value} < 0.01$ ) and rating level. We measured the risk of the firm in two ways. First by the volatility of firm performance, second by the profile of managerial firm performance.

We find that rating agencies influence market capitalization and explain some factor risk of the firms ().

The complete model include credit rating along with pension, financial and market distress and risk of management factor. Previous research focus rating level to debt decision nevertheless few of them include the enterprise risk management to the model. A new research will be underline the link between the enterprise risk management and the rating.

Table 2: Distribution of credit rating changes

Credit rating changes	Aggregate sample		PreFC subsample		DurFC subsample		PostFC subsample	
	Observations	Percentage	Observations	Percentage	Observations	Percentage	Observations	Percentage
<b>Upgrade</b>	56	8	21	9	24	11	11	5
<b>Downgrade</b>	66	10	24	11	27	12	15	7
<b>No change</b>	550	82	180	80	173	77	197	88
<b>Rating level1 (score)</b>	531		174		178		179	
<b>Rating level2 (dummy)</b>	255	13	84		86		85	
<b>Total</b>	672	100	225	100	224	100	223	100

Table 3: List of variables

<b>Variables</b>	<b>Definition</b>
<b>Dependent variables</b>	
Rating	Rating as per Compustat
Ratelevel1	250 basis points premium for every notch below AAA+
Ratelevel2	0 if investment grade (A) 1 if below investment grade (BBB)
<b>Independent variables</b>	
Industry dummies	Dummy variable if one of 5 industry classification
Year dummies	Dummy variable if one year or if pre, during or post crisis
AT	Total assets per compustat
DLTT	Long term debt in current year per compustat
LT	Long term debt per compustat
SEQ	Shareholder equity per compustat
EBIT	Ebit per compustat
EPSFI	Earnings per share per compustat
IB	Income before tax per compustat
XRD	R&D expense per compustat
OANCF	Operating net cash flow per compustat
Mktvalt	Market value of equity at BS date per compustat
PPENT	Property plant and equipment assets per compustat
XINT	Interest expense per compustat
ROA	Return on assets (IB/AT)
SDROA	Standard deviation of return on assets
MTB	Market to book (Mktvalt/SEQ)
CFO	Change in operating cash flow
Earn	ROE (IB/SEQ)
LEV	Leverage (LTD+ LLTD/ (SEQ+ LTD + LLTD))
RandD	Research and development expense as proportion of total assets
Int cov	Interest coverage ratio
Capint	Capital intensity ratio
<b>B Market risk variables</b>	
Rtnstk	Average annual return on stock
Varstkrtn	Variance of daily stock return
Idiorisk	LN (1-r2)/r2 per Ferreira and Laux (JF, 2007)

Beta Beta of stock based on year regression of daily returns on daily index

**Other variables:**

Accruals quality Accruals quality measure per Dechow et al. (CAR, 2010)  
LnBuseg Log of no of business lines (operating segments) compustat  
Fors05 No of geog.business lines (geog segment) compustat  
Pfund Ratio of DB assets to ABO pension obligations  
Coefop Coefficient of variation of operating income  
Coefvas Coefficient of variation of value added (=sales – COGS)  
Coefocf Coefficient of variation of operating cash flows

**Risk management variables:**

tuseNL Whether firm discloses notional value of derivatives (FOREX, int rate)  
TuseFV Whether firm discloses notional value of derivatives (FOREX, int rate)  
THNL Total notional value of hedged derivatives (forex, int rate)  
THFV Total fair value of hedged derivatives (forex, intrate)  
TNHNL Total notional value of unhedged derivatives (forex, int rate)  
TNHFV Total fair value of unhedged derivatives (forex, intrate)  
TNL Total notional value of all derivatives (forex, int rate)  
TFV Total fair value of all derivatives (forex, int rate)  
Comuse Whether firm uses commodity derivatives  
Comval Total notional value of commodity derivatives  
Creditfacility Value of credit facility  
Captive Whether firm has a captive insurer (=1) or not (=0)  
penRRC Value of total cash flow commitments related to pensions  
Offsopl Total value of off balance sheet guarantees and operating leases  
CIBEGNI Total value of opening comprehensive income  
CICURR Value of movement in foreign currency translation reserve  
CIDERGL Value of movement in cash flow derivative reserve  
CIOTHER Value of movement of other CI reserves  
CIPEN Value of movement of pension reserve  
CISECGL Value of available for sale financial instrument reserve  
SPCE Core earnings per S&P  
STKCO Stock option expense

**Pension variables:**

Perpencost Current periodic pension expense

SurplABO	Difference between ABO and fair value of pension assets
SurplPBO	Difference between PBO and fair value of pension assets
ActgABO	Actuarial gain/loss on pension liability (ABO)
ActgPBO	Actuarial gain/loss on pension liability (PBO)
FvGain	Difference between actual and expected rate of return on pension assets
perEQ	Percentage of DB pension assets invested in equity securities
perRisk	Percentage of DB pension assets invested in risky (i.e. neither bond nor equity) securities
PRBO	Total value of unfunded other retirement benefit obligations (health care)
<b>Tax variables:</b>	
BTD	Book to tax income difference cumulated over five prior years per Dechow et al. (CAR,2010)
StradETR	Sum of tax expense difference (per Dechow et al. CAR 2010)
StradCTR	Sum of tax cash payment difference (per Dechow et al)

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Table 4 : Variable distribution

Variable	Period 2005-2010				Before the financial crisis 2005-2006		During the financial crisis 2007-2008		After the financial crisis 2009-2010	
	Minimum	Maximum	Mean	Std. Deviation	Mean	Std.deviation	Mean	Std. Deviation	Mean	Std.deviation
AT	2352,00	97769,00	31919,4857	18895,04102	28551,1460	18393,15894	32457,4853	18298,35965	19538,89730	1320,31632
SEQ	-1294,00	91914,00	17203,8574	15563,60331	16235,9541	14840,20950	16787,8115	15285,27807	18619,4036	16509,87243
EBIT	-732,00	9864,00	3686,6580	2243,23706	3448,8725	2037,34441	3912,6706	2282,66972	3698,6997	2384,64672
EPSFI	-17,43	15,15	2,8265	2,74210	2,9526	2,36262	2,7095	3,33704	2,8173	2,41649
IB	-29580,00	45220,00	3275,6764	5146,73776	3347,5254	4774,12537	3179,9920	6175,73157	3300,0560	4310,46054
XRD	,00	10991,00	1010,8865	1815,22447	923,8363	1653,78531	1040,8464	1837,03493	1069,2802	1950,52042
mktvalt	3759,75	504239,58	54959,9825	60979,33826	57523,2510	62334,56771	54738,9393	64751,82786	52564,2818	55532,66656
PPENT	649,70	199548,00	14834,9275	21440,34519	13195,3915	18548,51243	14926,3346	20857,09487	16418,4018	24538,65146
ROA	-,44	6,47	,1481	,39467	,1882	,56926	,1337	,31073	,1219	,20748
SDROA	,00	3,18	,0987	,32678	,1051	,39024	,1050	,34848	,0857	,21443
MTB	-30,38	196,18	4,4380	8,80629	5,5571	13,67159	3,9138	4,22909	3,8295	5,04831
CFO	-,13	13,42	,2599	,72394	,2933	,72130	,2232	,42824	,2634	,93742
Earn	-,02	4,36	,1645	,26040	,1868	,32300	,1534	,12585	,1531	,28890
LEV	,00	60,75	1,2258	3,52965	1,3772	3,74688	1,0008	2,16746	1,3010	4,33740
RanD	,00	1,78	,0439	,11832	,0444	,10598	,0442	,13566	,0431	,11159
capint	,03	38,89	,6052	1,83943	,6779	1,62828	,4769	,65175	,6620	2,67667
intcov	-11,16	8639,00	32,9618	345,55879	23,5633	55,51248	22,5938	92,66261	53,3825	595,58328
perRisk	,00	99,20	7,6085	10,39852	5,7911	6,95568	7,2561	8,47526	9,8752	14,15410
perEq	,00	99,40	49,9086	24,85740	54,4760	25,63681	49,3888	24,59762	45,6478	23,57899
Fvgain	-27084,88	6620,84	-185,4867	2317,37753	274,5766	803,34857	-1230,1725	3600,95633	399,3445	967,27271
ActgABO	-10160,80	8650,70	253,3040	1213,30063	250,5977	1138,44558	-148,1203	1108,51141	666,3273	1258,41163
surpPBO	-15368,00	15150,00	-991,0600	2402,19660	-560,2046	1699,24792	-737,5226	2823,18873	-1702,1842	2416,83330
DLTT	,00	377138,00	10064,7481	30191,42519	8013,9868	22886,19551	10110,8800	30934,24819	12124,8050	35541,56217
LTT	1365,28	684157,00	29757,1094	61945,63156	25993,5742	55347,82937	30325,5208	65774,82852	33057,9212	64367,14835
OANCF	-3150,00	59725,00	5732,2234	7302,02609	5251,6133	6735,62004	6021,7931	8168,00793	5928,5219	6917,43967

<b>XINT</b>	,00	26209,00	668,4701	1963,07641	594,1840	1688,55496	718,6132	2393,06367	692,3592	1722,67072
<b>rtnstk</b>	,04	2,60	,4772	,24807	,4954	,19898	,5095	,25440	,4261	,27784
<b>varstkrtn</b>	,01	41,87	1,4313	4,76703	2,2220	6,10559	1,9937	5,22472	,0214	,00977
<b>idiorisk</b>	-15,07	4,22	-,1508	3,96559	,2080	4,56553	-1,2294	4,82817	,5742	,98310
<b>beta</b>	,00	111,83	1,8541	7,07588	3,7259	11,89452	,8941	,44254	,8697	,33801
<b>AQ</b>	-,31	,27	,0019	,03910	-,0020	,03807	,0031	,04390	,0046	,03463
<b>lnBUSEG</b>	,00	3,89	1,5949	,95096	1,3562	,86697	2,0062	,95611	1,2525	,79654
<b>fors05</b>	-,29	1,81	,3936	,34694	,3263	,27172	,4395	,41111	,4462	,31387
<b>pfund05</b>	,34	1,38	,8461	,17232	,8631	,16310	,8606	,19506	,7811	,11886
<b>coefop05</b>	-181,51	6,43	-,0703	7,74955	,2043	,19802	,2983	,96231	-1,3289	17,13772
<b>coefvas05</b>	-4,68	4639,58	8,5863	196,75216	,1927	,18066	,3192	,50256	41,2469	436,43732
<b>coefocf05</b>	-5,33	9,68	,2564	,57270	,3059	,72007	,2013	,42041	,2677	,49372
<b>tuseNL</b>	,00	1,00	,0142	,11856	,0000	,00000	,0000	,00000	,0690	,25449
<b>tuseFV</b>	,00	1,00	,0178	,13232	,0045	,06682	,0000	,00000	,0776	,26868
<b>tHNL</b>	-544,00	376267,00	3367,0091	20838,87483	2083,5275	3830,21890	1798,2339	4227,27466	8874,8155	44991,96930
<b>tHFV</b>	-1559,00	41055,00	265,3790	1926,93229	-8,2254	97,17503	643,4502	3011,23170	63,6500	333,46956
<b>tHNHL</b>	-40,00	18315,00	235,9095	1256,24494	68,3976	305,96445	159,9820	919,62008	710,0870	2376,82487
<b>tNHFV</b>	-347,00	1069,00	3,0183	56,40830	-1,3020	12,77981	1,2096	23,76035	14,9565	118,64015
<b>tNL</b>	-544,00	376267,00	3606,9719	20938,18126	2151,9251	3818,59545	1958,2159	4383,48941	9652,6400	45263,54584
<b>tFV</b>	-1559,00	41055,00	268,8669	1932,15270	-9,5274	98,67738	644,6599	3011,12884	79,1513	427,59723
<b>Comuse</b>	,00	1,00	,3641	,48155	,3125	,46455	,3750	,48521	,4144	,49398
<b>Comderval</b>	,00	34219,00	389,7315	2397,34546	158,1830	505,78971	465,8661	2384,12746	563,7950	3454,30917
<b>Credfacility</b>	,00	64800,00	2802,2892	5777,58468	2371,9152	5589,76983	3008,3214	6321,90620	3042,7321	5350,33934
<b>captive</b>	,00	1,00	,5015	,50039	,5000	,50112	,5000	,50112	,5051	,50124
<b>penRRC</b>	,00	87000,00	3471,6949	10767,64282	3063,8684	10380,24891	3762,1910	12235,92865	3519,7383	9782,31105
<b>offbspol</b>	,00	36806,00	3522,8841	5241,75107	3224,7703	4888,60784	3651,3839	5413,46727	3700,9667	5424,53288
<b>CIBEGNI</b>	-495,00	9786,00	2579,1685	1952,96357	2504,7289	1949,39976	2763,3190	1989,06455	2466,9529	1914,29378
<b>CICURR</b>	-11007,00	6543,00	9,6569	1026,32655	33,2669	581,58789	-102,7235	1408,26184	99,1334	917,16998
<b>CIDERGL</b>	-2951,00	2355,00	-4,9648	248,60270	6,1115	234,05703	-23,5041	318,70879	2,4457	169,54297
<b>CIOTHER</b>	-5261,00	4944,00	2,0380	339,68176	7,7502	173,70531	-13,0876	382,48001	11,6662	414,28121
<b>CIPEN</b>	-14856,00	4678,00	-177,3757	1233,12672	-44,8818	773,72810	-440,7391	1902,05280	-46,5136	503,12695



<b>CISECGL</b>	-3218,00	2659,00	-4,5969	206,03439	-13,5483	126,97289	-41,7515	260,79987	42,9252	200,29580
<b>SPCE</b>	-7981,00	44959,15	3317,2912	4767,38297	3296,6154	4709,00069	3375,2583	5337,49928	3279,1484	4195,70639
<b>STKCO</b>	-64,00	4272,00	220,0172	305,29964	218,9899	418,03120	214,2631	223,37824	226,7479	262,96444
<b>perpencst</b>	-83,60	991,00	167,1625	198,37070	178,5146	207,40632	145,7352	186,72458	177,2720	199,62536
<b>surplABO</b>	-11433,00	18489,00	-341,9018	2131,10527	131,0445	1751,09560	-141,1513	2681,15122	-1043,2463	1631,76111
<b>ActgPBO</b>	-11310,47	8187,87	219,7336	1183,73002	243,6344	813,98983	-247,5458	1175,13461	672,1505	1334,81912
<b>PRBO</b>	,00	27809,00	1604,0717	3289,82290	1576,4900	3239,41833	1560,9085	3311,88544	1676,9896	3336,16139
<b>BTD</b>	-34889,06	78,01	-904,7371	2499,65724	-745,0908	1780,73142	-700,8773	1622,65183	-1263,0371	3565,47213
<b>StradETR</b>	-3,41	20,59	1,3840	1,38891	1,4015	1,42357	1,4726	1,73656	1,2790	,86919
<b>StradCETR</b>	-27,66	37,62	1,6703	3,86093	1,9453	5,48799	1,8199	3,48483	1,2383	1,43563

Table 5: Cross-Correlations Matrix

	Ratinglevel1	Ratinglevel2	sdROA	IODIRISK	CIO TH	CID E RGL	BETA	earn	VAR	CIBEGNI	MTB	CISEC	CICUR	ROA	STKCO	CFO	Intcov	SPCE	CIPE N	LEV	capit
Ratinglevel1	1	,702(*)	-,063	,001	,037	,021	,004	-,016	,017	-,249(**)	-,264(**)	,059	,022	-,157(**)	-,319(**)	-,105(**)	-,018	-,505(**)	,066	-,072	-,072
Ratinglevel2	,702(*)	1	,104	,987	,340	,601	,941	,672	,731	,000	,000	,134	,586	,000	,000	,007	,653	,000	,089	,061	,064
sdROA	-,063	,040	1	,044	-,011	,003	-,015	,479(**)	-,035	,182(**)	,112(**)	-,036	,072	,677(**)	,085(*)	,509(**)	-,017	,442(**)	-,057	,459(*)	,388(*)
IODIRISK	,001	-,034	,044	1	,001	,016	-,138(**)	,025	-,930(**)	-,006	,029	,014	-,040	,061	,035	,038	,048	,042	-,037	,039	,024
CIO TH	,037	-,002	-,011	,001	1	,026	-,002	-,012	,008	-,016	,005	,062	-,173(**)	,004	,008	,003	,000	-,011	,023	,019	,007
CID E RGL	,021	,019	,003	,016	,026	1	,011	,005	-,012	-,052	,016	,460(**)	,029	-,018	-,034	-,006	,016	-,060	,195(*)	-,018	,012
IBETA	,601	,642	,932	,747	,517	,830	,907	,807	,196	,691	,000	,478	,651	,419	,883	,692	,130	,000	,661	,769	
Earn	,941	,369	,763	,004	,962	,830	,909	,000	,614	,745	,958	,952	,658	,886	,881	,928	,639	,660	,983	,800	
VAR	-,016	-,029	,479(**)	,025	-,012	,005	,006	1	,000	,056	,043	,029	,023	,731(**)	,043	,868(**)	,003	,156(**)	,069	,897(*)	,756(*)
CIBEGNI	,672	,456	,000	,598	,747	,907	,909	,992	,151	,269	,470	,567	,000	,289	,000	,947	,000	,078	,000	,000	
MTB	,017	,054	-,035	,930(*)	,008	-,012	,215(**)	,000	1	-,008	-,031	-,005	,050	-,050	-,045	-,020	-,024	-,059	,070	-,025	-,008
CFO	,731	,259	,472	,000	,862	,807	,000	,992	,862	,520	,925	,315	,298	,376	,685	,631	,220	,151	,604	,864	
LEV	-,249(*)	-,266(*)	,182(**)	-,006	-,016	-,052	-,024	,056	-,008	1	,116(**)	-,097(*)	-,062	,200(**)	,338(**)	,122(**)	,044	,488(**)	,138(*)	,073	,055
capit	,000	,000	,000	,900	,687	,196	,614	,151	,862	,003	,014	,120	,000	,000	,002	,269	,000	,000	,060	,159	
	-,264(*)	-,135(*)	,112(**)	,029	,005	,016	-,016	,043	-,031	,116(**)	1	-,069	-,006	,177(**)	,081(*)	,109(**)	-,005	,476(**)	,003	,077(*)	,081(*)

	,000	,000	,004	,549	,893	,691	,745	,269	,520	,003		,082	,880	,000	,045	,005	,896	,000	,944	,048	,037
<b>CISE</b>	,059	-.006	-.036	,014	,062	,460(*)	-.003	,029	-.005	-.097(*)	-.069	1	,381(**)	,004	,064	,009	,096(*)	-.109(**)	,276(*)	-.010	,014
<b>C</b>	,134	,873	,371	,777	,116	,000	,958	,470	,925	,014	,082		,000	,918	,121	,826	,017	,006	,000	,796	,718
<b>CIC</b>																					
<b>URR</b>	,022	,013	,072	-.040	,173(*)	,029	,003	,023	,050	-.062	-.006	,381(**)	1	,091(*)	,007	,052	-.001	-.013	,371(*)	,011	,066
<b>ROA</b>	,586	,734	,069	,422	,000	,478	,952	,567	,315	,120	,880	,000		,022	,870	,193	,988	,745	,000	,789	,093
<b>ROA</b>	-	-	,677(**)	,061	,004	-.018	-.021	,731(**)	-.050	,200(**)	,177(**)	,004	,091(*)	1	,151(**)	,744(**)	-.009	,511(**)	,017	,691(*)	,546(*)
<b>STK</b>	,000	,025	,000	,208	,916	,651	,658	,000	,298	,000	,000	,918	,022		,000	,000	,825	,000	,670	,000	,000
<b>CO</b>	-	-	,085(*)	,035	,008	-.034	-.007	,043	-.045	,338(**)	,081(*)	,064	,007	,151(**)	1	,175(**)	,107(*)	,417(**)	-.042	,107(*)	,052
<b>CFO</b>	,000	,000	,034	,488	,842	,419	,886	,289	,376	,000	,045	,121	,870	,000		,000	,009	,000	,301	,008	,201
<b>CFO</b>	-	-	,509(**)	,038	,003	-.006	,007	,868(**)	-.020	,122(**)	,109(**)	,009	,052	,744(**)	,175(**)	1	-.006	,359(**)	,040	,935(*)	,925(*)
<b>Intc</b>	,007	,123	,000	,426	,948	,883	,881	,000	,685	,002	,005	,826	,193	,000	,000		,872	,000	,302	,000	,000
<b>ov</b>	-.018	-.055	-.017	,048	,000	,016	-.004	,003	-.024	,044	-.005	,096(*)	-.001	-.009	,107(**)	-.006	1	,014	,015	-.021	-.014
<b>SPC</b>	,653	,161	,658	,330	,996	,692	,928	,947	,631	,269	,896	,017	,988	,825	,009	,872		,725	,715	,588	,727
<b>E</b>	-	-	,442(**)	,042	-.011	-.060	-.023	,156(**)	-.059	,488(**)	,476(**)	-.109(**)	-.013	,511(**)	,417(**)	,359(**)	,014	1	,094(*)	,263(*)	,301(*)
<b>CIPE</b>	,000	,000	,000	,385	,770	,130	,639	,000	,220	,000	,000	,006	,745	,000	,000	,000	,725		,015	,000	,000
<b>N</b>	,066	,066	-.057	-.037	,023	,195(*)	,021	,069	,070	-.138(**)	,003	,276(**)	,371(**)	,017	-.042	,040	,015	-.094(*)	1	,009	,058
<b>LEV</b>	,089	,089	,142	,450	,551	,000	,660	,078	,151	,000	,944	,000	,000	,670	,301	,302	,715	,015		,824	,138
<b>LEV</b>	-.072	-.017	,459(**)	,039	,019	-.018	,001	,897(**)	-.025	,073	,077(*)	-.010	,011	,691(**)	,107(**)	,935(**)	-.021	,263(**)	,009	1	,851(*)
<b>Capi</b>	,061	,664	,000	,413	,623	,661	,983	,000	,604	,060	,048	,796	,789	,000	,008	,000	,588	,000	,824		,000
<b>nt</b>	-.072	-.014	,388(**)	,024	,007	,012	,012	,756(**)	-.008	,055	,081(*)	,014	,066	,546(**)	,052	,925(**)	-.014	,301(**)	,058	,851(*)	1
	,064	,720	,000	,615	,854	,769	,800	,000	,864	,159	,037	,718	,093	,000	,201	,000	,727	,000	,138	,000	

Pearson correlations are used. \*\* Correlation is significant at the 0.01 level (2-tailed).  
\* Correlation is significant at the 0.05 level (2-tailed).

Table 6: Regression– for testing association of levels in firm risk against levels of credit rating- All years

Dependant variable	Ratinglevel1					Ratinglevel2				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			B	Std. Error	Beta		
(Constant)	,757	,031		24,684	,000	,231	,043		5,342	,000
DsdROA	,001	,001	,063	,740	,461	,003	,002	,152	1,682	,095
DIODIRISK	,005	,003	,158	1,748	,083	,008	,004	,182	1,890	,061
DCIOTH	15,883	27,008	,049	,588	,558	52,752	38,057	,122	1,386	,169
DCIDERGL	-,552	,250	-,1599	-2,211	,029	-,256	,352	-,561	-,728	,468
DIBETA	2,32E-007	,000	,088	1,051	,295	5,30E-007	,000	,152	1,699	,092
DPNCA	-,449	1,245	-,055	-,360	,719	-,275	1,754	-,026	-,157	,876
Dearn	-,007	,022	-,052	-,328	,744	-,022	,032	-,115	-,682	,497
DVAR	-,001	,000	-,208	-2,275	,025	-,001	,001	-,098	1,005	,317
DCIBEGNI	-,008	,152	-,005	-,055	,956	-,027	,215	-,013	-,126	,900
DMTB	-,009	,051	-,027	-,174	,862	-,052	,072	-,122	-,725	,470
DCISEC	1,128	4,688	,029	,241	,810	-1,635	6,606	-,032	-,247	,805
DCICURR	,481	,287	,186	1,675	,097	,328	,405	,096	,809	,420
DROA	-,035	,052	-,150	-,673	,502	-,084	,074	-,272	1,142	,256
DSTKCO	5,930	2,361	1,773	2,512	,013	2,884	3,327	,652	,867	,388
DCFO	,002	,030	,014	,075	,941	,040	,043	,188	,937	,351
Dintcov	,028	,052	,088	,539	,591	,069	,073	,164	,942	,348
DSPCE	,456	,145	,364	3,145	,002	,256	,204	,155	1,254	,212
DCIPEN	-,047	,234	-,030	-,201	,841	,044	,330	,021	,133	,895
DLEV	-,011	,182	-,038	-,059	,953	-,298	,257	-,799	1,162	,248
Dcapint	-,024	,199	-,084	-,120	,905	,313	,281	,832	1,113	,268

Table 6 bis: Regression– for testing association of levels in firm risk against levels of credit rating

Dependant variable	Before the financial crisis 2005-2006					During the financial crisis 2007-2008					After the financial crisis 2009-2010				
	Ratinglevel1					Ratinglevel1					Ratinglevel1				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta			B	Std. Error	Beta			B	Std. Error	Beta		
(Constant)	,851	,073		11,688	,000	,909	,072		12,601	,000	,887	,098		9,046	,000
DsdROA	,003	,002	,295	1,414	,171	,108	,103	,176	1,049	,307	-,006	,009	-,094	-,691	,496
DIODIRISK	,237	,153	1,214	1,552	,134	-,012	,013	-,249	-,958	,350	,006	,003	,271	1,946	,063
DCIOTH	16,739	30,565	,094	,548	,589	167,155	115,519	,250	1,447	,163	-	298,954	-,009	-,056	,956
DCIBERGL	-,328	,705	-,1814	-,465	,646	12,353	4,411	,860	2,801	,011	,827	4,123	,082	,201	,843
DIBETA	,004	,003	,187	1,091	,287	1,86E-009	,000	,001	,007	,994	-,310	,214	-,305	-,1446	,161
DPNCA	-,1463	4,208	-,087	-,348	,731	11,182	3,239	1,455	3,452	,003	-,3771	2,893	-,475	-,1303	,204
Dearn	-,001	,029	-,011	-,034	,973	1,326	,445	1,686	2,978	,007	,260	,164	1,474	1,585	,125
DVAR	,002	,002	,799	1,041	,309	,018	,067	,048	,266	,793	,422	,279	,278	1,511	,143
DCIBEGNI	,693	,618	,437	1,120	,274	1,046	,684	,499	1,528	,142	,325	,255	,236	1,274	,214
DMTB	,168	,289	,149	,582	,566	-,093	,152	-,113	-,613	,547	-,041	,093	-,199	-,441	,663
DCISEC	-,4455	14,677	-,064	-,304	,764	-,3994	8,937	-,099	-,447	,660	9,596	9,490	,301	1,011	,322
DCICURR	1,546	1,216	,363	1,271	,216	,598	,580	,215	1,030	,315	,379	,400	,173	,947	,353
DROA	-,088	,271	-,543	-,326	,748	-,383	,282	-,485	-,1356	,190	-,028	,073	-,119	-,378	,709
DSTKCO	2,592	6,347	1,481	,408	,687	19,684	7,374	,666	2,669	,015	14,613	7,246	,360	2,017	,055
DCFO	-,290	,228	-,1650	-,1273	,216	,006	,045	,024	,141	,889	,020	,059	,157	,332	,743
Dintcov	,012	,098	,038	,127	,900	,064	,297	,059	,216	,831	-,213	,202	-,891	-,1050	,304
DSPCE	-,744	,840	-,631	-,886	,385	-,1113	,974	-,367	-,1143	,266	,257	,192	,263	1,336	,194
DCIPEN	-,026	,737	-,007	-,035	,973	-,1918	,718	-,1530	-,2672	,015	,389	,560	,232	,695	,493
DLEV	,351	,429	2,078	,817	,422	-,299	,418	-,279	-,715	,483	,576	,415	1,499	1,388	,177
Dcapint	-,089	,572	-,522	-,156	,877	,214	,500	,166	,427	,674	-,809	,452	-,2172	-,1790	,086

Table 6 Ter: Regression– for testing association of levels in firm risk against levels of credit rating

Dependant variable	Before the financial crisis 2005-2006					During the financial crisis 2007-2008					After the financial crisis 2009-2010				
	Ratinglevel2					Ratinglevel2					Ratinglevel2				
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta			B	Std. Error	Beta			B	Std. Error	Beta		
(Constant)	,385	,114		3,373	,003	,391	,114		3,422	,003	,464	,140		3,316	,003
DsdROA	,006	,003	,476	2,222	,036	,138	,162	,184	,850	,405	-,018	,013	-,223	-1,426	,166
DIODIRISK	,230	,240	,768	,958	,348	-,012	,020	-,191	-,572	,574	,010	,004	,391	2,432	,023
DCIOTH	69,635	47,955	,255	1,452	,160	112,576	182,885	-,136	-,616	,545	459,588	427,076	-,206	-1,076	,292
DCIDERGL	,827	1,106	2,990	,747	,462	14,227	6,983	,804	2,037	,055	2,750	5,890	,221	,467	,645
DIBETA	,006	,005	,206	1,170	,254	7,57E-007	,000	,383	1,900	,072	-,764	,306	-,609	-2,497	,019
DPNCA	-2,917	6,602	-,113	-,442	,663	10,165	5,128	1,074	1,982	,061	-6,594	4,133	-,672	-1,595	,123
Dearn	-,022	,045	-,165	-,489	,629	1,153	,705	1,191	1,636	,117	,358	,234	1,643	1,529	,139
DVAR	,002	,003	,572	,727	,475	,143	,106	,315	1,345	,194	,735	,399	,391	1,841	,078
DCIBEGNI	1,710	,970	,705	1,763	,091	,520	1,084	,201	,479	,637	,169	,365	,099	,464	,647
DMTB	-,068	,453	-,039	-,149	,882	,004	,240	,004	,016	,988	-,115	,133	-,453	-,869	,393
DCISEC	-20,069	23,027	-,187	-,872	,392	-,852	14,148	-,017	-,060	,953	13,081	13,558	,332	,965	,344
DCICURR	,179	1,908	,028	,094	,926	1,175	,918	,344	1,279	,215	,531	,572	,196	,928	,362
DROA	-,153	,426	-,615	-,360	,722	,278	,447	,286	,623	,540	-,082	,104	-,288	-,791	,436
DSTKCO	-8,657	9,959	-3,233	-,869	,394	16,629	11,673	,457	1,425	,170	8,366	10,351	,167	,808	,427
DCFO	,177	,358	,657	,494	,626	-,004	,072	-,012	-,058	,954	,064	,085	,415	,760	,454
Dintcov	-,052	,154	-,105	-,339	,737	-,151	,471	-,112	-,320	,752	-,278	,289	-,943	-,962	,345
DSPCE	-1,200	1,317	-,665	-,911	,372	-2,105	1,542	-,563	-1,365	,187	-,038	,275	-,031	-,138	,892
DCIPEN	,167	1,156	,032	,145	,886	-1,184	1,137	-,767	-1,042	,310	,771	,800	,372	,963	,345
DLEV	-,058	,673	-,224	-,086	,932	-1,109	,662	-,841	-1,675	,109	,581	,593	1,224	,980	,336
Dcapint	,003	,897	,010	,003	,998	-,423	,792	-,267	-,534	,599	-,884	,646	-1,919	-1,368	,183

Table 7: Logistic regression

	Upgrade					Downgrade					No change				
	B	S.E.	Wald	Sig.	Exp(B)	B	S.E.	Wald	Sig.	Exp(B)	B	S.E.	Wald	Sig.	Exp(B)
DsdROA	-,033	,305	,012	,913	,967	-,005	,041	,015	,901	,995	,006	,039	,025	,874	1,006
DVAR	,001	,004	,041	,839	1,001	-,966	1,034	,873	,350	,381	-,001	,003	,064	,800	,999
DIODIRISK	-,007	,053	,017	,895	,993	-,010	,084	,016	,900	,990	,005	,042	,016	,898	1,005
DIBETA	,000	,001	,042	,837	1,000	,000	,000	,228	,633	1,000	,000	,000	,468	,494	1,000
DCIBEGNI	3,247	2,993	1,177	,278	25,725	-,962	3,684	,068	,794	,382	-,1815	2,302	,621	,431	,163
DCICURR	3,220	3,461	,866	,352	25,037	2,604	4,524	,331	,565	13,514	-,2997	2,872	1,089	,297	,050
DCIDERGL	-,612	3,346	,033	,855	,542	1,826	5,897	,096	,757	6,208	-,939	2,509	,140	,708	,391
DCIOTH	272,551	206,665	1,739	,187	2,331E+18	-,41,250	555,223	,006	,941	,000	-,223,044	206,887	1,162	,281	,000
DCIPEN	8,484	3,976	4,554	,033	4837,255	-,657	3,869	,029	,865	,519	-,4,411	2,846	2,403	,121	,012
DCISEC	-,58,175	59,080	,970	,325	,000	13,284	109,720	,015	,904	587430,180	24,207	48,037	,254	,614	32574706007,735
DPNCA	-,23,593	17,730	1,771	,183	,000	10,354	25,999	,159	,690	31387,819	11,410	13,436	,721	,396	90259,685
DSPCE	-,1,056	2,388	,196	,658	,348	,419	3,203	,017	,896	1,520	,572	1,970	,084	,771	1,773
DSTKCO	7,845	30,250	,067	,795	2551,884	-,12,390	53,092	,054	,815	,000	5,688	21,995	,067	,796	295,351
Dearn	,770	,585	1,731	,188	2,160	,247	,436	,320	,571	1,280	-,466	,414	1,265	,261	,628
DMTB	-,037	,850	,002	,965	,963	-,1,600	1,123	2,033	,154	,202	,792	,571	1,922	,166	2,208
DROA	,104	1,020	,010	,919	1,110	,514	1,118	,211	,646	1,672	-,547	,755	,524	,469	,579
DCFO	,201	,745	,073	,788	1,222	,088	,501	,031	,861	1,092	-,147	,332	,197	,658	,863
Dintcov	-,396	,712	,309	,578	,673	-,270	,833	,105	,746	,763	,336	,589	,325	,568	1,399
DLEV	-,915	2,682	,116	,733	,401	5,997	2,775	4,668	,031	402,076	-,2,655	1,837	2,088	,148	,070
Dcapint	-,5,309	3,360	2,496	,114	,005	-,7,408	3,557	4,336	,037	,001	6,673	2,730	5,978	,014	791,149
Constant	-,2,590	,443	34,243	,000	,075	-,3,290	,620	28,163	,000	,037	1,903	,325	34,333	,000	6,707

a Variable(s) entered on step 1: DsdROA, DVAR, DIODIRISK, DIBETA, DCIBEGNI, DCICURR, DCIBERGL, DCIOTH, DCIPEN, DCISEC, DPNCA, DSPCE, DSTKCO, Dearn, DMTB, DROA, DCFO, Dintcov, DLEV, Dcapint.

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