

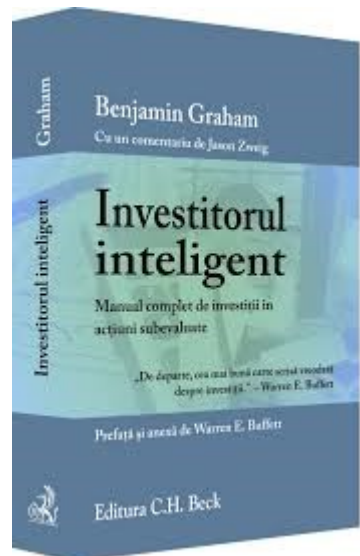


Ministerul Educației Naționale
ROMÂNIA
UNIVERSITATEA DE
MEDICINĂ, FARMACIE,
ȘTIINȚE ȘI TEHNOLOGIE
DIN TÂRGU MUREȘ

FACULTATEA DE
ECONOMIE ȘI DREPT
Faculty of Economics and Law



MEASURING INVESTORS' REACTION TO EARLY SIGNS OF FRAUDULENT CORPORATE BEHAVIOR IN FINANCIAL REPORTING – EMPIRICAL FINDINGS ON BUCHAREST STOCK EXCHANGE



PhD. Lecturer Ioan Ovidiu SPĂȚĂCEAN

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BACKGROUND

Corporate scandals occurred in the Romanian capital market landscape have *weakened the investors' confidence*

Harinvest (2013) - Eur 3.5-4 m losses & Romcab (2017) - Eur 15.29 m losses;

Previously conducted research proved that investors have shown *little or no interest* for audit reports. Moreover, *evidence of irrational investment behavior* where brought to light, such as increase in stock price whilst audit opinion was modified (Spătăcean O., Tatiana D., *Audit opinion impact in the investors' perception - empirical evidence on BSE, 2018*). Other research (Spătăcean O., *The Impact of Corporate Governance Failure for Investment Firms - Harinvest Case, 2017*) *revealed red flags that had emerged long before the investment firm filed for bankruptcy*, without any institutional prompt reaction (central depository, market operator or the financial supervision authority).

Research hypothesis : investors do not consider early signs that may reveal corporate potential fraudulent reporting.





METHOD

1) *Analytical review*

(financial statements, key financial ratios, audit reports, insolvency risk assessment, market conditions)

2) *Messod D. Beneish model (1999)* - eight variables (financial ratios) to distinguish between manipulated and non-manipulated earnings. The probability of manipulation is correlated with:

- unusual increases in receivables (Days' Sales in Receivables);
- deteriorating gross margins (Gross Margin Index);
- decreasing asset quality (Asset Quality Index);
- downsizing sales and growth (Sales Growth Index)
- significant change in depreciation (Depreciation Index);
- significant change in sales, general and administrative expenses (SGA Index);
- increasing accruals (Accruals to Assets Index).
- unfavorable changes in financial condition (Leverage Index)

3) Examine the *stock price volatility* measured over Q1 of the year when the reporting entity went into insolvency (general observation rule).



Beneish MODEL

Variables (financial ratios)

(1) Days Sales in Receivables Index

$$(DSRI) DSRI = (Net\ Receivables_t / Sales_t) / (Net\ Receivables_{t-1} / Sales_{t-1})$$

(2) Gross Margin Index (GMI)

$$GMI = [(Sales_{t-1} - COGS_{t-1}) / Sales_{t-1}] / [(Sales_t - COGS_t) / Sales_t]$$

(3) Asset Quality Index (AQI)

$$AQI = [1 - (Current\ Assets_t + PP\&E_t + Securities_t) / Total\ Assets_t] / [1 - (Current\ Assets_{t-1} + PP\&E_{t-1} + Securities_{t-1}) / Total\ Assets_{t-1}]$$

(4) Sales Growth Index (SGI)

$$SGI = Sales_t / Sales_{t-1}$$

(5) Depreciation Index (DEPI)

$$DEPI = (Depreciation_{t-1} / (PP\&E_{t-1} + Depreciation_{t-1})) / (Depreciation_t / (PP\&E_t + Depreciation_t))$$

(6) Sales General and Administrative Expenses Index (SGAI)

$$SGAI = (SG\&A\ Expense_t / Sales_t) / (SG\&A\ Expense_{t-1} / Sales_{t-1})$$

(7) Leverage Index (LVGI)

$$LVGI = [(Current\ Liabilities_t + Total\ Long\ Term\ Debt_t) / Total\ Assets_t] / [(Current\ Liabilities_{t-1} + Total\ Long\ Term\ Debt_{t-1}) / Total\ Assets_{t-1}]$$

(8) Total Accruals to Total Assets (TATA)

$$TATA = (Income\ from\ Continuing\ Operations_t - Cash\ Flows\ from\ Operations_t) / Total\ Assets_t$$

Formula

$$MScore = -4.84 + 0.92 * x1 + 0.528 * x2 + 0.404 * x3 + 0.892 * x4 + 0.115 * x5 - 0.172 * x6 + 4.679 * x7 - 0.327 * x8$$

Interpretation

M Score > (-)2.22 the company is likely to be a manipulator



MCAB CASE - Analytical review : irregularities in financial reporting



Reporting Period	Financial statement element	ANAF Reports (lei)	IFRS Reports (lei)	Differences (lei)
31/12/2016	Inventories	500.931.379	498.987.387	(1.943.992)
	Receivables	210.194.367	212.138.360	1.943.993
	Financial result	(179.413.881)	(179.774.793)	(360.912)
	Cash & equivalents	601.722	(49.374.248)	(49.975.970)
31/12/2015	Cash & equivalents	8.225.830	(18.270.902)	(26.496.732)
31/12/2014	Cash & equivalents	30.034.169	(4.215.416)	(34.249.585)



Conclusion:

Irregularities in financial reporting undermine the integrity of financial reporting and fuel suspicions regarding possible material misstatements due to fraud.

HRIV CASE - Analytical review : irregularities in financial reporting and internal controls, other inherent risks

- Current liabilities to clients (December 31, 2012) RON 127,017 vs. Cash and cash equivalents RON 126,508 (lack of client asset segregation rules);
- Current liabilities to vendors +31% YoY, Receivables +278% YoY, Equity -23% YoY, Operating Result RON -91,585 (going concern threats);
- Negative amount for deferred income tax RON -161,859 (controversial accounting policy)
- Net result reported to tax authorities (ANAF) RON 108,808 is different from the Statement of Comprehensive Income RON 114,535;
- Significant amount held as cash in hand (36%) - lack of client asset safeguard rules (promptly transfer to bank institutions);
- Internal control lack of effectiveness & efficiency (financial penalties imposed by FSA for fraudulent practices - improper use of client assets in 2009 and 2012);
- Involvement in a significant number of Sell-out trades (798 trades) totaling RON 175m - risk exposure signaling a possible lack of capital requirements, since the investment firms had no proper authorization for own trading.

Conclusion:

Red flags for potential fraudulent financial reporting had been present before Harinvest filed for bankruptcy



MCAB CASE - Analytical review : key financial ratios



Key financial ratio	31/12/ 2016 (p)	30/09/ 2016	30/06/ 2016	31/03/ 2016	01/01/ 2016	Rec. value	Comment
<i>Current liquidity</i>	0,85	1,05	1,02	1,02	1,02	> 2	Unsatisfactory
<i>Immediate liquidity</i>	0,32	0,32	0,28	0,33	0,36	> 0,8	Unsatisfactory
<i>Quick ratio</i>	0,02	0,02	0,02	0,01	0,02	> 0,5	Unsatisfactory
<i>Equity to Asset Ratio</i>	0,01	0,18	0,17	0,18	0,18	> 0,5	Critical
<i>Global Solvency Ratio</i>	1,01	1,22	1,20	1,21	1,22	> 1,5	Unsatisfactory
<i>Debt to Equity Ratio</i>	72,61	4,61	4,97	4,70	4,62	< 0,5	Critical
<i>Net asset value/share</i>	1,36 lei	21,76 lei	19,24 lei	18,31 lei	17,54 lei	n/a	Critical
<i>Price/share</i>	8,40 lei	8,90 lei	7,36 lei	7,84 lei	8,10	n/a	Consolidation
<i>Price/Book value</i>	***	0,41	0,38	0,43	0,46	n/a	Undervalued



Conclusions:

- 1) Solvency ratios proved critical all along 2016 reporting period (going concern issues), while PBV suggested undervalued stock (divergent signals);
- 2) Last seven trading sessions (13-17 February 2017) brought a price downfall of almost 85%, until preliminary 2017 result were made public, leaving the majority of investors off-guard.

MCAB CASE - Analytical review : insolvency risk assessment



Model / Scor Z	31/12/2016	31/12/2015	31/12/2014	31/12/2013	31/12/2012
Altman (1968)	1,235776	2,295735	2,150004	2,115895	1,779810
<i>Ranking</i>	$z < 1,81$	$1,81 < z < 2,99$	$1,81 < z < 2,99$	$1,81 < z < 2,99$	$z < 1,81$
<i>Assessment</i>	Difficulty	Uncertainty	Uncertainty	Uncertainty	Difficulty
Altman (1983)	0,290835	1,310394	1,316845	1,313504	1,049305
<i>Ranking</i>	$z < 1,23$	$1,23 < z < 2,90$	$1,23 < z < 2,90$	$1,23 < z < 2,90$	$z < 1,23$
<i>Assessment</i>	Difficulty	Uncertainty	Uncertainty	Uncertainty	Difficulty
Conan Holder (1978)	(0,012426)	0,068185	0,051768	(0,311877)	0,054663
<i>Ranking</i>	$(0,05) < z < 0,04$	$0,04 < z < 0,10$	$0,04 < z < 0,10$	$z < (0,05)$	$0,04 < z < 0,10$
<i>Assessment</i>	Danger	Alert	Alert	Bankruptcy	Alert

Conclusion:

Z Score Values over the period 2012- 2015 suggested a financial condition subject to significant insolvency risks



HRIV CASE - Analytical review : insolvency risk assessment

Model / Scor Z	2012	2011	2010
Altman (1968)	3.964735	4.737280	9.874196
<i>Ranking</i>	$z > 2,99$	$z > 2,99$	$z > 2,99$
<i>Assessment</i>	Safe Zone	Safe Zone	Safe Zone
Altman (1983)	2.672195	3.295843	6.864907
<i>Ranking</i>	$1.23 < z < 2.90$	$z > 2.90$	$z > 2.90$
<i>Assessment</i>	Grey Zone	Safe Zone	Safe Zone
Conan Holder (1978)	(0.161563)	0.229422	(0.189822)
<i>Ranking</i>	$z < (0.05)$	$z > 0.16$	$z < (0.05)$
<i>Assessment</i>	Failure Zone	Very good	Failure Zone

Conclusion:

Z Score Values according to Conan Holder model are highly volatile, suggesting a critical financial condition at the end of 2012 and 2010.



MCAB CASE - Analytical review : audit opinion



Date	Event	Actual price var. (%)	Reporting period	Audit adjustment (lei)	UNAV unadjusted (lei/share)	UNAV adjusted (lei/act.)	Expected price var. (%)
25.03.16	Audit report release	(0,25)	31.12.15	22.059.623	17,54	15,19	(13,40)
16.02.16	Preliminary results	11,34	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx
26.10.15	REGS listing	6,11	31.12.14	22.059.623	12,28	9,93	(19,14)

Conclusions:

- 1) Irrational investment behavior, not affected by audit adjustments that modified the opinion (improper capitalization of prepaid expenses, depreciation in receivables collection and inventory quantities).
- 2) Investors' irrational exuberance (+11% in stock price) was fueled by significant increase in equity (+60%), in operating revenues (+29%) and profit (+133%), as reporting in preliminary financial statements. This exuberance was not adjusted at all, as a response to the annual audit report release.



MCAB CASE - Analytical review : other red flags



- 1) Shareholders' listing suggests a high risk of decision power concentration (single shareholder entitled to 69% of voting rights);
- 2) Withdrawal of a notorious investment fund (Morgan Stanley) in 2016, by liquidating a 20% capital share;
- 3) Unusual increase in inventories (+ 4 times over 2013-2014) related to 100% increase in turnover (operating revenues) in the same period;
- 4) Over 100 payment incidents over December 2016 - January 2017;
- 5) Excessive risky corporate behavior in debt financing (intention to launch an international bond issue to raise Eur 200 m. in January 2017);
- 6) Omission to disclose 14 relevant litigations that occurred over 2016, in absence of proper recognition of provisions.



HRIV CASE - Analytical review of market conditions, other red flags



Year	Month	Monthly value (lei)	Annual value (lei)	Top (month/year)	Monthly market share/year (%)	Annual variation (%)
2013	11	17,753,542	277,343,499	2/2	29.71/26.78	40.57
	9	27,368,469	227,355,557	1/2	30.23/25.91	
	6	27,851,276	147,874,290	2/2	26.63/24.13	
	3	20,368,300	52,079,420	2/2	21.78/21.82	
2012	12	7,378,672	197,295,060	2/2	15.25/14.35	123.84
	9	14,110,065	146,970,863	2/2	14.01/13.74	
	6	22,394,645	89,653,632	2/3	19.17/11.80	
	3	15,540,830	34,335,013	3/3	11.16/9.76	
2011	12	24,216,353	88,139,183	2/2	27.76/10.05	n.a.
	9	3,458,204	4,413,954	6/16	3.26/0.89	

Conclusion: Trading activity indicators suggest a high exposure on the BVB structured product market, as a result of a significant increase in intensity (systemic risk).



MCAB CASE - Beneish Model testing

Financial variables	31/12/2016	31/12/2015	31/12/2014
<i>Days Sales in Receivables Index (DSRI)</i>	1.23	1.16	0.63
<i>Gross Margin Index (GMI)</i>	1.38	-0.58	-0.31
<i>Asset Quality Index (AQI)</i>	1.19	0.64	0.97
<i>Sales Growth Index (SGI)</i>	1.14	1.24	1.42
<i>Depreciation Index (DEPI)</i>	0.86	0.86	0.57
<i>Sales General and Administrative Expenses Index (SGAI)</i>	1.18	1.08	1.76
<i>Leverage Index (LVGI)</i>	1.24	0.99	1.03
<i>Total Accruals to Total Assets (TATA)</i>	-0.21	-0.02	-0.02
<i>Beneish M Score</i>	4.28	1.85	1.84
<i>Entity is likely to be a manipulator (M > -2,22)</i>	Yes	Yes	Yes

Conclusion: Beneish M Score validates a potential fraudulent corporate behavior in all reporting periods. A significant increase is observed based on 2016 financial statements (prior entering into insolvency)



HRIV CASE - Beneish Model testing

Financial variables	31/12/2012
<i>Days Sales in Receivables Index (DSRI)</i>	2.43
<i>Gross Margin Index (GMI)</i>	35.65
<i>Asset Quality Index (AQI)</i>	0.87
<i>Sales Growth Index (SGI)</i>	1.13
<i>Depreciation Index (DEPI)</i>	1.22
<i>Sales General and Administrative Expenses Index (SGAI)</i>	0.90
<i>Leverage Index (LVGI)</i>	1.53
<i>Total Accruals to Total Assets (TATA)</i>	0.18
<i>Beneish M Score</i>	24.69
<i>Entity is likely to be a manipulator (M > -2,22)</i>	Yes

Conclusion: Beneish M Score validates a potential fraudulent corporate behavior in 2012 (prior entering into insolvency). GMI has a significant impact, due to highly volatile dynamic.





Other Cases - Beneish Model testing

Symbol	Company	Suspension Date	Market Cap. (lei)	Industry	Allegations (Media)
UCM	UCM RESITA	6/12/2011	57,843,517	Fabricarea de motoare si turbine	Illegal VAT reimbursement allegation
COS	COS TARGOVISTE SA	25/02/2013	37,867,568	Productia de metale feroase	Workforce strikes/Suspicious privatization
MCAB	ROMCAB SA	20/2/2017	17,645,804	Fabricarea de cabluri cu fibra optica	Potential misrepresentations of inventory
ASP	RAFINARIA ASTRA ROMANA	20/06/2014	11,350,227	Fabricarea produselor din prelucrarea titeiului	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
VULC	Vulcan SA Bucuresti	22/05/2013	5,944,537	Productia generatoarelor de aburi	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
SCTB	SCT SA Bucuresti	22/12/2015	5,746,849	Lucrari de constructii drumuri si autostrazi	Illegal retrocession allegations concerning two significant shareholders
GROB	GEROM SA BUZAU	8/5/2017	3,884,648	Fabricarea sticlei plate	
GDP	GRUPUL EDITORILOR SA	26/11/2015	3,065,582	Inchirierea si subinchirierea bunurilor imobiliare	
ATLK	ATLAS SA Galati	1/17/2014	3,006,976	Transporturi rutiere de marfuri	
COFI	CONCEFA SA SIBIU	10/5/2017	2,516,586	Lucrari de constructii rezidentiale si nerezidentiale	
BAZL	TERRACOTTA STAR SA	27/10/2017	2,039,455	Extractia pietrisului si nisipului	

Sample: BSE delisted/suspended companies, in insolvency/bankruptcy, mkt. capitalization above RON 5m (future work, extend to RON 2m).





Other CASES - Beneish Model testing

Financial variables	UCM (2010)	COS (2012)	ASP (2013)	VULC (2011)	SCTB (2014)
<i>Days Sales in Receivables Index (DSRI)</i>	15.95	1.06	0.94	1.19	1.03
<i>Gross Margin Index (GMI)</i>	-0.10	1.06	6.35	199.15	-0.08
<i>Asset Quality Index (AQI)</i>	0.24	0.70	1.02	0.38	2.28
<i>Sales Growth Index (SGI)</i>	0.72	0.88	1.40	0.89	0.23
<i>Depreciation Index (DEPI)</i>	0.33	1.06	1.04	0.74	1.19
<i>Sales General and Administrative Expenses Index (SGAI)</i>	0.99	0.58	0.80	0.64	0.37
<i>Leverage Index (LVGI)</i>	1.42	1.36	1.10	1.23	0.99
<i>Total Accruals to Total Assets (TATA)</i>	-0.09	-0.25	-0.03	-0.23	-0.28
<i>Beneish M Score</i>	17.07	4.23	6.16	108.15	1.97
<i>Entity is likely to be a manipulator (M > -2,22)</i>	Yes	Yes	Yes	Yes	Yes
<i>Price change (var.%) Q1, subsequent fiscal year</i>	-22.86	86.44	0.00	51.82	-64,12

Conclusion: Beneish M Score validates a potential fraudulent corporate behavior in all cases

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Preliminary conclusions

- 1) Early signs of potentially manipulated financial statements **were present** both in MCAB and HRIV study cases (analytical review, insolvency testing, investors' reaction to audit report, Beneish model testing). They were also present in all other cases related to insolvent listed companies (M-Score);
- 2) The research hypothesis was validated both in MCAB and HRIV study cases (investors did not consider & stay alert to early signs that may reveal corporate potential fraudulent reporting). However, this conclusion is valid only in two (COS & VULC) out of five cases tested for the rest of listed companies under scrutiny. Yet, whenever the price suffered corrections (UCM & SCTB), we do not assume that investors took into account the results of any model used to assess the potential of financial statements to be manipulated (future work).

Future work

- 1) Questionnaire-based risk fraud examinations within Romanian investors' community
- 2) Extend the sample (threshold of RON 2m) + other models

**Thank you for your attention. Any suggestion will be treated
with most interest.**

PhD. Lecturer
IOAN OVIDIU SPATACEAN
ovidiu.spatacean@ea.upm.ro

