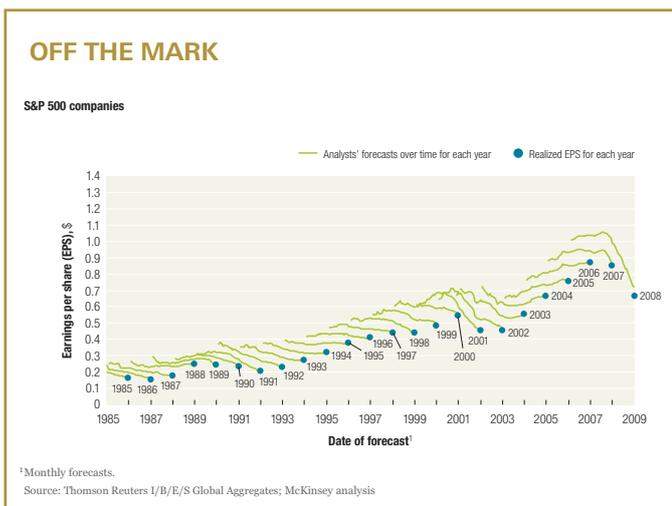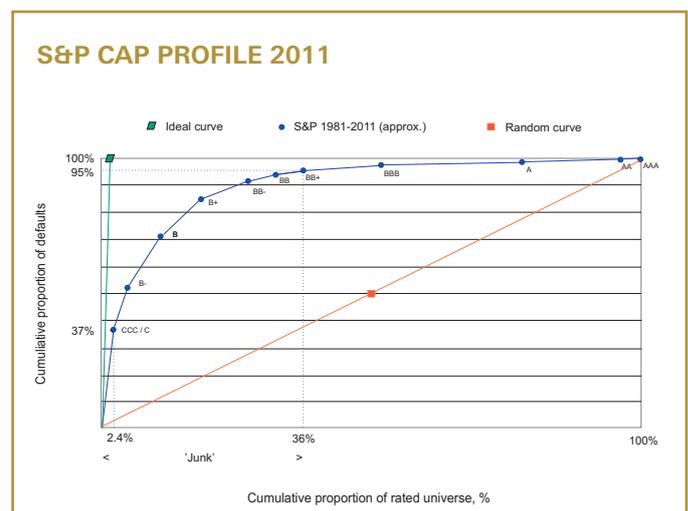# Early warning
for business failure

Evert-Jan Lammers

Business failure refers to events such as bankruptcy, default, fraud, asset stripping and forced recapitalization, often in combination with a substantial decline of the stock price.[1] Early warning for such events must be part of the corporate governance system embedding any public company. In this article we look at auditors, credit rating agencies and credit scoring models.

CEO's and business analysts have a low credibility when it comes to reporting on corporate performance. Studies from McKinsey show that «analysts were typically over-optimistic, slow to revise their forecasts to reflect new economic conditions, and prone to making increasingly inaccurate forecasts when economic growth declined». The below graph shows that in 20 out of 24 years (83 percent) the forecasts were too optimistic.[2]

OFF THE MARK

S&P 500 companies

— Analysts' forecasts over time for each year ● Realized EPS for each year

[1] Monthly forecasts.
Source: Thomson Reuters I/B/E/S Global Aggregates; McKinsey analysis

As a result investors look for additional assurance from credit rating agencies and auditors. For these gatekeepers there are rules and regulations regarding the independence of the firm and the quality of the services provided. For example credit rating agencies must warn for «default» risk. And auditors must warn for «going concern issues»[3] and must confirm that financial statements are «free from material error – including fraud»[4].

CREDIT RATING AGENCIES. Rating agencies communicate on the accuracy of their ratings via the Lorenzcurve[5]. For example on their website Standard & Poor's have published the following Lorenzcurve for the reporting period 1981 to 2011[6]:

S&P CAP PROFILE 2011

■ Ideal curve ● S&P 1981-2011 (approx.) ■ Random curve

Cumulative proportion of defaults

Cumulative proportion of rated universe, %

The curve shows that for 63 percent of the defaults in the portfolio S&P had not given a CCC/C-grade[7]. That is unacceptable to investors.

Now you may say that S&P typically warns for «speculative» grades. Indeed the «speculative» group covers 95 percent of the defaults (vertical axis). True, but S&P considers 36 percent «speculative» whereas only 1.7 percent effectively defaults[8]. Not so good: the so-called False-discovery error of the «speculative» criterion is as high as 95 percent[9] and more than one third of all rated companies are wrongly stigmatized as «speculative»[10].

Unfortunately the other credit rating agencies don't provide adequate information on their websites to derive such performance statistics. None of the following provide this information on their websites: Moody's[11], Fitch[12](US), Coface[13](France), Creditreform[14] and URA[15](Germany).

Most credit rating agencies do provide their Gini-coefficient, which normally lies between 65 percent and 85 percent. The Gini-coefficient however is a complex academic concept. S&P reports a Gini of 82 percent for the period 1981 to 2011 which seems good at first sight but it ignores the Non-detection error (S&P: 63 percent) and the False Discovery error (S&P: 95 percent) which are straightforward, easy-to-understand ratios.

AUDITORS. Are the auditors doing any better? The accuracy rate of auditors' early warning varies per country and among other things also per audit firm size. International research shows that auditors don't warn of impending business failure in roughly 50 percent of the cases:
- VS: 40 to 50 percent[16] of failures without Going Concern Report (GCR);
- Europe: 80 to 90 percent[17], Belgium: 42 percent[18], The Netherlands: 75 percent[19] failures without GCR-report.

Furthermore international research shows that 80 to 90 percent of the GCR-reports from auditors are not followed by discontinuity in the next year (False-discovery error)[20].

I conclude that the accuracy profile of auditors is rather similar to that of credit rating agencies (based on S&P-statistics alone), in the sense that they are both unreliable in early warning for business failure.

This doesn't mean that auditors and credit rating agencies are doing a bad job:
- They have more complex objectives than just ‹early warning for business failure›;
- For auditors we note that the concept of «going concern» is rather vague[21];
- Credit ratings and audit opinions are public, having a positive impact on corporate recovery; speaking of «False discovery» is rather ironic: operation failed, patient still alive. Further research is needed here.

ESMA. The European Securities and Markets Authority has published a Consultation paper for CRA Regulation to be effective in the second half of 2013[22]. According to this Consultation paper it will be mandatory for credit rating agencies to:
- involve a rating analyst, especially for the analysis of qualitative data;
- use techniques that ensure consistent treatment of quantitative data.

As a regulator ESMA will assess whether the techniques applied by credit rating agencies are adequate. It is our understanding that «consistent» (as in «consistent treatment of quantitative data») refers only to the consistency of the rating process and not the accuracy (or: quality) of the default-risk assessment.

In a previous section we have assessed that default prediction by credit rating agencies is not very accurate. According to the Consultation paper ESMA seems only concerned with the «consistency» of the treatment of quantitative data, and not with the rating quality.
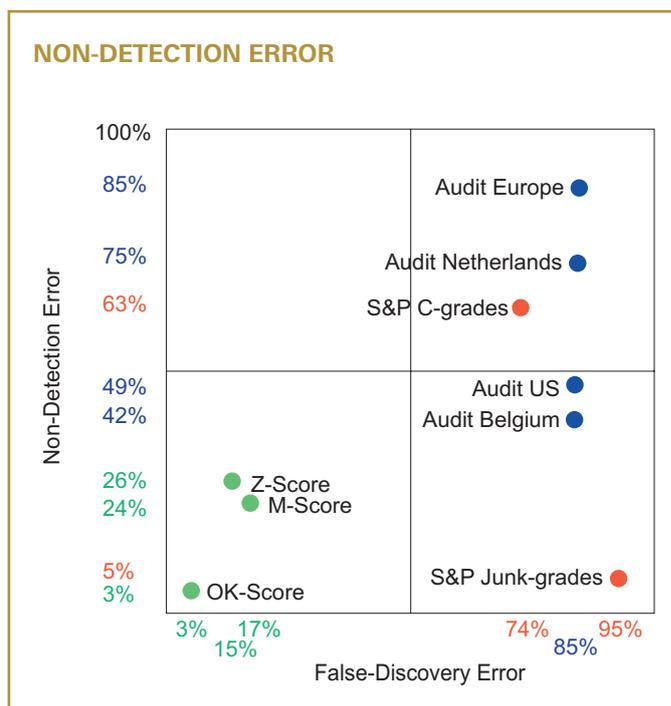
In a competitive market it is reasonable to assume that credit rating agencies will compete on both the price and the quality of their services. We recommend credit rating agencies implement «enhanced techniques» that allow both the consistent treatment of the quantitative data and an improved accuracy of the default-risk assessment. Such an enhanced technique could be a credit scoring model, which we will explain hereafter.

CREDIT SCORING MODELS. In the second half of the 20st Century dozens of mathematical models have been developed for the analysis of company financial statements. Examples are:
- Z-Score, developed by Professor E.I. Altman in 1968, for failure prediction. The model uses 8 criteria and is freely available on the internet. Non-detection error: 26 percent. False-discovery error: 15 percent;[23]
- M-Score: developed by professor M.D. Beneish in 1999, for the detection of manipulation of financial statements. The model uses 8 criteria and is freely available on the internet. Non-detection error: 24 percent. False-discovery error 17 percent;[24]
- OK-Score: developed by W.D. Okkerse in 2000, for both failure prediction and the detection of financial manipulation . The model works with financial statements of five consecutive years. Non-detection error: 3 percent. False-discovery error: 3 percent. It also flags financial statement fraud[26].

One limitation is that credit scoring models are not suited for financials, such as banks and insurance companies.

SUMMARY. In this article we have assessed the accuracy of failure prediction of three different groups: auditors, credit rat-

NON-DETECTION ERROR

	False-Discovery Error	
Non-Detection Error		
100%		
85%		Audit Europe ●
75%		Audit Netherlands ●
63%	S&P C-grades ●	
49%		Audit US ●
42%		Audit Belgium ●
26%	● Z-Score	
24%	● M-Score	
5%		S&P Junk-grades ●
3%	● OK-Score	
	3% 17% 15%	74% 85% 95%

ing agencies and credit scoring models. Their performances can be summarized as follows:

CONCLUSION. Both auditors and credit rating agencies can sub-stantially improve the accuracy profile of their failure prediction by adopting credit scoring techniques in their risk assessments. Overall accuracy can increase to more than 75 percent (even 97 percent with the OK-Score), which is important from a corporate governance perspective.

MONITORING MIX
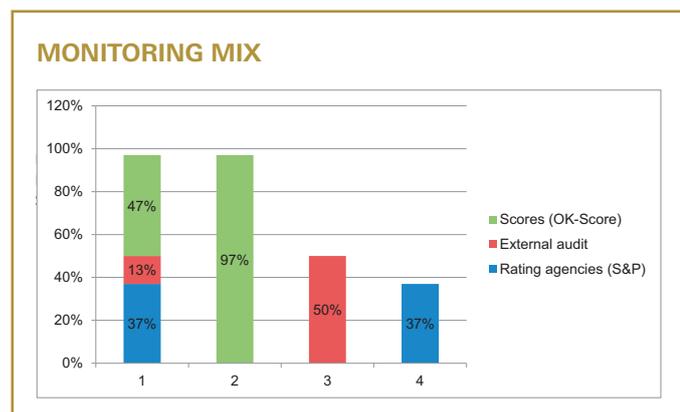
The advantages of such improved warning for business failure can be vast, both to investors, issuers and society at large.

Footnotes

1 Simplified definition of business failure: «...either a formal bankruptcy, as a result of which the failing company ceases to exist in its current form, or a business distress situation indicated by a drop in market share value by more than 50 percent over a period of one month», in: BOLLEN L., MERTENS G., MEUWISSEN R., VAN RAAK J., and SCHELLEMAN C., «Classification and Analysis of Major European Business Failures», Maastricht Accounting, Auditing and Information Management Research Center (MARC) of University Maastricht, and Rotterdam School of Management of the Erasmus University Rotterdam, October 2005 http://www.google.be/url?sa=t&rct=j&q=classification percent20and percent20analysis percent20of percent20major percent20european percent20business percent20failures percent20maastricht&source= web&cd=3&ved=0CDkQFjAC&url=http percent3A percent2F percent2 Fresources.rybinski.eu percent2Fresources percent2FsendFile percent3A 30a11ae4-be59-11de-85be-001b24eff4d8 per-cent3A1&ei=Neb7UO3qGK Wm0QWqjICIDQ&usg=AFQjCNHLUlSAiutwPIb76aiSbHdHOtSIOw

2 McKinsey Quarterly, April 2010, https://www.mckinseyquarterly.com/ Equity_analysts_Still_too_bullish_2565

3 The auditor has a responsibility to evaluate whether there is a substantial doubt about the entity's ability to continue as a going concern, in: International Standards on Auditing (ISA) Nr. 570, «Going Concern», 2010 http://www.ifac.org/sites/default/files/downloads/a031-2010-iaasb-hand-book-isa-570.pdf

4 An auditor conducting an audit in accordance with ISAs is responsible for obtaining reasonable assurance that the financial statements taken as a whole are free from material misstatement, whether caused by fraud or error, in: International Standards on Auditing (ISA) Nr. 240 «The auditor's responsibilities relating to fraud in an audit of financial statements», 2009, http://www.ifac.org/sites/default/files/downloads/a012-2010-iaasb-hand-book-isa-240.pdf

5 The Lorenz-curve reflects the Cumulative Accuracy Profile (CAP-profile) of rating agencies. ENGELMANN B., HAYDEN E. AND TACHE D., «Testing rating accuracy», in: Credit Risk, January 2003, http://www.german-zscore.de /docs/engelmann_2003.pdf

6 Standard and Poor's, «2011 Annual U.S. Corporate Default Study And Rating Transitions», 21 March 2012 http://www.standardandpoors.com/ ratings/articles/en/us/?articleType=HTML&assetID=1245330814766

7 Vertical axis: 100 percent minus 37 percent = 63 percent.

8 According to S & P the «speculative grades» are: BB, B, CCC, CC and C. As you can see on the horizontal axis, this corresponds to 36 percent of the rated universe.

9 Horizontal axis: (36 percent minus 2 percent*)/36 percent = 95 percent. (*overall default rate 1.7 percent).

10 36 percent minus 2 percent* = 34 percent. (*overall default rate 1.7 percent).

11 Moody's, Corporate Default and Recovery Rates 1920-2010, Moody's investors service, 28 February 2011, http://efinance.org.cn/cn/FEben/ Corporate percent20Default percent20andpercent20Recovery percent20 Rates, 1920 to 2010.pdf

12 Fitch Ratings, Credit Market Research – «Fitch Ratings Global Corporate Finance 2011 Transition and Default Study», 16 March 2012, http://www.fitchratings.com/web_content/nrsro/nav/NRSRO_Exhibit-1.pdf

13 Coface, http://www.cofacerating.fr/portail/general_accueil/accueil.asp? IP=CSFR

14 Creditreform, http://www.creditreform.de/Deutsch/Creditreform/index.jsp

15 URA Rating Agentur, www.ura.de/index.php?SYS_MNU03_00_current_ mp=3&View=Home

16 RAGHUNANDAN, K., «Going Concern Reporting Presentation to PCAOB's SAG», 9 November 2011, http://pcaobus.org/News/Events/Documents/ 11092011_SAGMeeting/Going_Concern_Academic_Research_Slides.pdf

17 BOLLEN L., MERTENS G., MEUWISSEN R., VAN RAAK J., and SCHELLE-MAN C., «Classification and Analysis of Major European Business Failures», Maastricht Accounting, Auditing and Information Management Research Center (MARC) of University Maas-tricht and RSM, October 2005, http://www.google.be/url?sa=t&rct=j&q=classification percent20and percent20analysis percent20of percent20major percent20european percent20business percent20failurespercent20maastricht&source=web&cd =3&ved=0CDkQFjAC&url=http percent3A percent2Fpercent2Fresources. rybinski.eu percent2Fresources percent2FsendFile percent3A30a11ae4-be59-11de-85be-001b24eff4d8 per-cent3A1&ei=Neb7UO3qGKWm0QW qjICIDQ&usg=AFQjCNHLUlSAiutwPIb76aiSbHdHOtSIOw

18 VANSTRAELEN, A. «Auditor economic incentives and going-concern opinions in a limited litigious Continental European business environment: empirical evidence from Belgium», in: Accountant and Business Research, Vol. 32, 2002, No. 3, pp. 171 to 186, http://arno.unimaas.nl/show.cgi?fid=14809

19 WOUDENBERG, J., «Continuïteitsparagraaf is geen self-fulfilling prophecy: Mythe ontrafeld», thesis NIVRA-Nyenrode Accountancy-program, October 2005, article published on 1 April 2006, http://www.accountant.nl/ Accountant/Archief/Archief+'de+Accountant'/2006/April+2006/ Continuiteitsparagraaf+is+geen+self+fulfilling+pro.aspx

20 WILLEKENS M., «Research Evidence on Going-Concern Opinions by Auditors», presentation at IFA-conference, Brussels 14 March 2013, http://www.triforensic.be/uploads/documents/ifa_slides_marleen_willeke ns_14032013.pdf

21 WILLEKENS M., id.

22 European Securities and Markets Authority, «Guidelines and recommendations on the scope of the CRA Regulation», Consultation paper, 20 December 2012, http://www.esma.europa.eu/system/files/2012-841.pdf

23 Accuracy rates based on self-reporting. See also: «Testing rating accuracy», Risk Magazine, January 2003; http://www.risk.net/data/Specal_Reports/pdf/credit/tech.pdf

24 Accuracy rates based on self-reporting. See: www.stockopedia.co.uk/ content/the-beneish-m-score-identifying-earnings-manipulation-and-short-candidates-56823/

25 Fuzzy logic is a form of many-valued logic or probabilistic logic. It deals with reasoning that is approximate rather than fixed and exact. Compared to traditional binary sets (where variables may take on true or false values) fuzzy logic variables may have a truth value that ranges in degree between 0 and 1. Fuzzy logic has been applied to many fields, from control theory to the theory of artificial intelligence.

26 Non-detection error (Type-II error) = 3 percent. False-discovery error = 3 percent. Accuracy rates based on self-reporting on more than 2,000 credit scores over the years 2002-2012, www.ok-ratinginstitute.eu

AUTOR

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