Indicators of Bankruptcy Fraud:
Towards a predictive model

Marius Braunsdorf
University of Twente

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Student number:	s1140515
1st supervisor:	Prof. dr. ir. Bernard P. Veldkamp
2nd supervisor:	Prof. dr. Ellen Giebels
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Abstract

This study examines which indicators are important in signaling bankruptcy fraud and how important professionals rate those indicators. From the literature examination, there seem to be 31 indicators that are believed to signal bankruptcy fraud. The research question is which indicators can predict fraud most successfully. This is answered through investigating the hypotheses: not all indicators appear with the same magnitude in fraudulent and non-fraudulent cases of bankruptcy and that the indicators receive different ratings of importance by the curators. 15 fraudulent bankruptcy cases were searched in the media and the dossiers were retrieved and analyzed for the presence of indicators, alongside with 45 non-fraudulent cases of bankruptcy. Furthermore a survey, also containing the 31 indicators was conducted. On this questionnaire 28 curators rated the indicators on a 5-point-Likkert scale. The results showed that both hypotheses are supported. There are several indicators that were significantly more often present in the fraudulent than in the non-fraudulent cases. Also, it was shown, that the curators do not rate the different indicators of fraud with the same importance, but that there are indicators that are rated significantly higher than others. Subsequently, with the help of that information a model for fraud prediction is derived and tested for its predictive value with 3 additional cases of fraudulent bankruptcies and 9 non-fraudulent bankruptcies. A model was created that could predict fraud through the presence of different indicators, found in the bankruptcy dossiers. From the two studies it became obvious, that the curators already apply a good focus, but that there are also shortcomings in the treatment of certain indicators. The studies yielded overlapping, but not identical conclusions. For future research it is advised to examine additional sources of data and to merge those findings into the model if possible. Through those findings a greater depth of information is achieved which eventually can lead to the formation of a more elaborate model for fraud detection.

Samenvatting

Deze studie doet onderzoek naar de indicatoren om faillissementsfraude vast te stellen. Verder wordt onderzocht hoe belangrijk professionals (curatoren) op dit gebied deze indicatoren beoordelen. Uit het literatuuronderzoek bleek dat er 31 belangrijke indicatoren van faillissementsfraude bestaan. De onderzoeksvraag is welke indicatoren het best fraude zullen voorspellen. Deze vraag wordt beantwoord door de volgende hypotheses te bekijken; ten eerste: Niet alle indicatoren treden met dezelfde frequentie in de frauderende casussen dan in de niet frauderende casussen op. Ten tweede: Niet alle indicatoren krijgen dezelfde belangrijkheid van de curatoren toegekend. Daarvoor zijn in totaal 15 gevallen van faillissement uit de media geselecteerd en de bijbehorende faillissementsverslagen geanalyseerd op de aanwezigheid van de indicatoren. Vervolgens werd hetzelfde met 45 niet frauderende casussen gedaan met het doel indicatoren te vinden die significant vaker in frauderende casussen optreden. Verder werd er een vragenlijst van bij 300 curatoren uitgezet; 28 ervan waren bruikbaar voor een verdere analyse. Op deze vragenlijst moesten de curatoren de belangrijkheid van de indicatoren op een 5-punt-Likkert-schaal beoordelen. Uit de resultaten blijkt, dat beide hypothese bevestigd worden. Er zijn inderdaad indicatoren, die significant vaker in frauderende casussen present zijn, dan in niet frauderende casussen. Bovendien is aangetoond, dat de curatoren niet alle indicator even belangrijk vinden, maar dat er een significante verschil in de beoordeling qua belangrijkheid bestaat. Uit de onderzoeken blijkt ook, dat de curatoren overal een goede focus op belangrijke indicatoren hebben, maar dat er ook enkele tekortkomingen zijn. De onderzoeken komen dus gedeeltelijk overeen. Met behulp van deze informatie wordt een model aangemaakt dat fraude kan voorspellen.

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Towards a Predictive Model

A fraudster is usually seen as somebody who tries to trick other people to gain a personal advantage. While the boundaries of fraud seem clear-cut, there is certainly more to fraud than this. The act of fraud accounts for monetary losses in the height of billions every year in our society (de Bruijn, 2013). A necessity for a correct estimation is a clear definition of fraud. A recent definition by Schimmel (2004) states that fraud is an act, that includes a presentation of wrong facts, which pretend to justify the act and make it possible to obtain an advantage through the presented facts.

Fraud can be classified in two different categories: First the category of vertical fraud, where the disadvantaged party is always the government of a country, as in the example of social welfare fraud. Second, it may concern horizontal fraud, which includes all acts of fraud that effect individual inhabitants and companies in the private sector, such as bankruptcy fraud. Those two dimensions of fraud are accountable for an estimated loss of around 11 billion euros last year only in the Netherlands (de Bruijn, 2013).

It has been generally acknowledged that when it is possible to obtain an unjustified advantage, people are inclined to make an effort to obtain that advantage. As such, fraud permeates our history since the beginning of our society. That it has always been regarded, as a problem is visible in the 7^{th} and 8^{th} commandment of Christianity, as stated in the bible: "Thou shalt not steal" (Deut. 24:7) and "You shall not bear false witness against your neighbor." (Deut. 5:19). However, it is definitely confusing, that there is no law that specifically forbids the act of fraud. It is more a broad concept of illegal acts and in front of the law every case must be analyzed separately in order to classify it as fraud.

The aim of this study is to provide a detailed overview about the nature of bankruptcy fraud. This should eventually help to counteract the tendency of the public sector to treat each case of fraud individually and competitive. This could partly stem from the fact that there is barely attention paid to horizontal fraud. It could surely be counteracted more efficient with a collective approach, that makes beneficiary information easily accessible.. This approach would make it easier to identify and to combat bankruptcy fraud. It does not only disadvantage a single institution, but news over bankruptcy fraud eventually causes a loss of trust in the sector. Many resources could be saved, by making this information publicly accessible and stop the individual reevaluation of every single case. There is a growing concern for fraud in our society, especially in the private sector. This is not only advantageous but also necessary to combat fraud and is likely to result in much higher gains than investments. (Brooks, Button, & Frimpong, 2008).

There is not much known about the process responsible to make persons engaging in fraudulent acts (Murphy, & Dacin, 2011). This is not only unfortunate, because the society has to come up for the resulting monetary losses, but also because it plays a big role concerning the image. Through the monetary loss, the economy has to face every year, it also plays a part in the general economical instability, which ultimately can lead to massive losses of jobs and income for the population as a whole. During the last year, there have been 12,306 cases of bankruptcy - 10% more than in 2012- in the Netherlands alone. This increase of bankruptcy incidents in turn raises the possibilities of committed fraud in those cases (CBS, 2014). Bankruptcy fraud is a very serious problem in our society, with an estimated monetary cost of 1.3 billion euro only in the last year (de Bruijn, 2013). It is expected, that 12% of all bankruptcy cases, be due to definitely criminal actions. Additionally another 12% of all bankruptcy filings show signs of some unethical and irresponsible management, thus probably criminal actions can be presumed (CBS, 2010). It is believed that an engagement in such question worthy, risky and often fraudulent management practices stems from a narcissistic tendency of managers. They desire to display a better company performance than those of non-narcissistic managers, which causes a relation between narcissism and fraud (Rijsenbilt, & Commandeur, 2013). This high prevalence of fraudulent acts in the course of bankruptcy, seems shocking, but with a chance of detection of only 2% and an average gain yielding up to 200.000€ per case bankruptcy fraud constitutes a very low risk, very high payoff situation (Veldkamp, & de Vries, 2008).

Bankruptcy is regarded as the inability to repay the debts of that company to the respective creditors. It describes a legal status, in which, all the left over assets are proportional distributed over the creditors of the bankrupt organization. It also defines the end of that organization, which makes it not more liable for the cumulated debts (Knegt, et al., 2005). The term, bankruptcy fraud refers to a fraudulent act, committed in the course of a company filing for bankruptcy.

Bankruptcy fraud is regarded as a white-collar crime, or a corporate crime. The former refers to a crime against businesses and the latter to a crime by a business. This classification is rather arbitrary, since crimes against businesses, are a very homogenous category, which at least partly, include crimes by a business (Levi, 2013). Generally, a white-collar crime is defined as a nonviolent but criminal act, committed by a person with a high professional status inside the organization. Thus, the violation is also connected to the occupation of the deviant person. A white-collar criminal is a person, who inherits a higher social position than most other criminals. It is also important to mention that those violations of trust or deliberately wrong representations of facts by a person or an organization are indeed against the law. A mere unethical practice or a violation of an unofficial code of conduct is not sufficient to classify an act as crime (Braithwaite, 1985).

Regarding the legal framework, bankruptcy fraud can be divided into two major forms: First the filing for bankruptcy is set up or used to disadvantage the creditors. This happens through the founding of a company that is deliberately navigated into bankruptcy, in order to gain advantage from the benefit it received from its creditors. Second, if a company is going bankrupt, deliberately or not, the assets of the company are withdrawn, in order to secure them for the own advantage and to avoid the obligation to distribute them to the creditors. (Knegt, et al., 2005). Following Tromp, Snippe, Bieleman and de Bie (2008) those acts are mainly committed through three different modes of operation. First there is the possibility to set a straw man in charge as the head of a company that is deliberately navigated into bankruptcy. This straw man can possibly be bankrupt himself, so that he cannot be made accountable for agreements made by the company and the manager is not longer liable for the debts. Another widely used approach to committing bankruptcy fraud is to set up an obscure structure of the company. Within this structure, different sister-companies can use the services of each other at totally undue costs, with the aim of letting one company book immense profit and another going deliberately bankrupt. Finally, there are the opportunists. Somebody who's company runs the risk of going bankrupt or already is, tries to sell or hide potential assets, that otherwise would be distributed to the creditors in order to claim their value for himself.

There are a number of indicators that should be considered, while investigating a case of bankruptcy for a possible attempt of fraud. Knegt et al., (2005) mention a number of different indicators that are likely to be connected to committed fraud. Those indicators are found through literature research and interviews with professionals in that field of work. The indicators are categorized to achieve an better overview amongst the 4 categories administration, assets and liabilities, management and perspective after bankruptcy. Which indicators constitute the concerning category can be retrieved from Table 1; the numbers indicate the place in the questionnaire used for the survey.

Table 1

Categories of indicators

Category	Indicators
Administration	-The shares are not paid (1) -The account statements are missing (2) -The administration is missing incomplete (12) -The annual financial statements of the private company are inaccessible or not filed correctly (13) Notes seem to be feigned (16)
Assets and liabilities	-The assets seem to be undervalued (3) -The distribution of assets is unbalanced during the separation process (4) -The distribution of liabilities is unbalanced during the separation process (5) -Large parts of the assets are sold short before the bankruptcy (15) -Assets are discovered after the bankruptcy (19) -Too much staff was a reason for bankruptcy (23)
Management	-The company is a part of a network of corporates (7) -The company itself filed for bankruptcy (8) -The board of directors changed short before the bankruptcy (9) -The statutes changed short before the bankruptcy (10) - On or more directors were involved in the bankruptcy of themselves or other corporates (11)

	-There are private expenditures at the expense of the company (14) -There are payments that disadvantage creditors (17) -Actio Pauliana has to be considered (20) -Illegal actions are discovered (21) The company filed for bankruptcy after an agreement with a lender (22) -The name of the company changed short before the bankruptcy (29) - It is tried to gain a dismissal/dissolution order for large parts of the staff, short before the bankruptcy (30) -Improper management seems to be a reason for bankruptcy (31)
Perspective after bankruptcy	-Former directors want to take over assets and liabilities (24) -Restart of the company is considered (25) - Agreements have been reached between creditors of the old and investors of the new private company (26) -Activities of the private company are continued through a related corporation (26) -The private company is sold to one or more old directors, who continue the activities of the private company (28)

The above mentioned Actio Pauliana refers to a voluntary legal act committed, short before the filing for bankruptcy, form that is known, that it will discredit the creditors of the company. This transaction can possibly be considered and subsequently made unlawful (van Dijck, 2005). Veldkamp and de Vries (2008) also mention some of these indicators, namely: a change of ownership, short before the bankruptcy of a company, a change in the business practice of the company and the lack of annual financial statements, as well as the criminal record of members of the board of directors and the number of verdicts, of those members as influential indicators for fraud.

Thus, the goal of this study is to contribute to the detection of bankruptcy fraud, through investigation the question, which indicators predict bankruptcy fraud most successfully. The hypotheses under investigation ought to answer the question are: First, the indicators appear in different magnitudes in the fraudulent and the non-fraudulent cases. Second, the indicators receive a different importance when rated from professionals in that work field. Through answering the questions it becomes clear which indicators are the most important. The answers also shed light on where the attention currently is focused on respectively where it should be focused on. Furthermore, a model for fraud detection can be derived, from the information which indicators are most often present in fraudulent cases. This is achieved through the use of psychometric methods. With the help of those methods bankruptcy fraud becomes measurable, which constitutes an important branch in this area of research (Nunnally, & Bernstein, 1994). With the help of that inventory it is possible to make the most important information concerning bankruptcy fraud easily accessible to a large range of people through the Dutch Fraud Initiative.

Method

The study was presented to an ethical commission, which did not have any consideration about the ethical correctness, concerning the design of the study. A mixed methods approach was used. In order to obtain the results searched for, a document study and a validation study in form of a survey were conducted.

Bankruptcy Dossiers

Cases In the period of May 10, 2014 until May 24, 2014, 15 Cases of bankruptcy were selected, where fraud was present (see Appendix 1). Those cases were found because they gained attention in magazines with an economic focus, in local newspapers or in the news of Dutch prosecution officials. Access to that information was gained through the websites of those institutions. The cases were found through Google with a combination of the key words: Faillissement, geval, fraude, faillissementsfraude, aangetoond, opgelicht, 2013, 2014 and 2012. Furthermore the dossiers of bankrupt companies that were explicitly mentioned in the news were retrieved from www.faillissementsdossier.nl, www.faillissementen.nl, and www.curatoren.nl or directly from the websites of the offices of the assigned curators. Those are online databases for publicly accessible bankruptcy dossiers. In addition to those 15 cases, indicating fraudulent behavior, 45 cases were no fraud was suspected were used for comparison. The cases were matched, where possible, for branch in which the company is active and place were the bankruptcy was uttered. Where this was not possible the cases were selected at random. This sample was used to build the model of fraud prediction. Additionally 3 fraudulent cases were chosen, alongside with 9 cases where no fraud was present. They were selected in a manner identical to the first sample. The number of cases in the second sample ensured the same ratio of fraudulent and non-fraudulent cases as in the original sample (see Appendix 2). This sample was used for the investigation of the model, concerning its predictive power.

Material A checklist containing 31 indicators of bankruptcy fraud was used to analyze the dossiers, indicating presence or absence of the indicators (see Appendix 3).

Procedure The cases were analyzed by reading the dossiers that curators set up during the processing of a bankruptcy. If there was an indicator for fraud found in one of those cases the indicator was rated present on that case, if not, it was rated absent. The aim was to see which indicators are significantly more frequently present in the dossiers of the fraudulent than in the dossiers of the non-fraudulent cases. With the help of that information, a model is derived and subsequently tested for its predictive power with the second sample of bankruptcy cases.

Analysis In order to test the first hypothesis the information derived from the bankruptcy dossiers was analyzed, using an independent t-test. The test shows if there is a significant difference in the amount of present indicators. Furthermore, to gain insight in which indicators are significantly more present in the fraudulent than in the non-fraudulent cases, chi-square tests were deployed to the single indicators.

Survey

Participants The participants were randomly selected from a population of officially assigned curators, retrieved from www.faillissementen.nl. The participants were informed about the aim of the study, as well as the fact that participation is completely voluntary and that they could withdraw from the study at any moment if they wish to. A total of 300 curators were contacted, of whom 42 replied, which means that the response rate was 14%. However, only 28 of those 42 recipients answered the questionnaire completely, thus 14 had to be excluded from further analysis. From the 28 individuals who answered the questionnaire 25 (89.3%) were male and 3 (10.7%) were female. The age of the participants ranged from 28 to 65 (M = 45.68, SD = 10.91) and the work experience covered a range of 1 to 35 years (M = 14,14, SD = 10.12). Due to a lack of information about the population, it cannot be guaranteed, that this sample is representational for the whole population of curators.

Material The questionnaire contained questions about the demographic variables sex, age and years of work experience, as well as 31 statements resembling the indicators of fraud. Those could be rated on a 5 point-Likert -scale from 1, very unimportant, to 5, very important (see Appendix 4).

Procedure The online study was conducted in order to be able to externally validate the model, derived from the document study. There was one moment of measurement, where the recipients were contacted via e-mail to fill an online-survey to rate the importance of the indicators. The collection of that data took place from May 10, 2014 until May 30, 2014. The information was used to gain insight into significant differences in the rating of importance from the curators and how these differences look like. Additionally, it was checked whether there are any differences in the answers concerning the demographic variables: age, gender, and work experience. This was done to shed light on possible discrepancies in the rating of distinguishing indicators of fraud. That knowledge helps to drain the attention from indicators that are not signaling fraud and the attention of the curators can be directed to the indicators that are really important in the signalization of fraud.

Analysis To investigate the second hypothesis a General Linear Model ANOVA was conducted to see if there are significant differences in the rating of importance the curators assigned to the respective indicators. To further gain insight in where those differences are, a pairwise comparison, using Bonferroni intervals, was carried out.

Results

Bankruptcy Dossiers

The frequency of the different indicators for the fraudulent, as well as for the non-fraudulent cases can be seen in Table 2. It is obvious, that the most frequently found indicators for the fraudulent cases, are that the company is a part of a network of corporations (86.7%), that the administration is incomplete (46.7%) and that annual financial statements of the company are not correctly filed (40.0%), as well as the consideration of Actio Pauliana (66.7%) and that incompetent administration seems to be a reason for bankruptcy (60.0%). It also can be seen; that the most frequent indicators found in the non-fraudulent cases are that the Company forms a part of a network of corporations (42,2%), that Actio Pauliana should be considered (20.0%) and that the annual financial statements are not filed correctly (17.8%). But even for those, that are also frequent in fraudulent cases, the frequency is consistently lower.

Table 2

Frequency of indicators of fraud in fraudulent cases of bankruptcy (in total %)

Indicator	**Present**	
	Fraud (N=15)	No fraud (N=45)
1. The shares are not paid	20.00%	4.4%
2. The account statements are missing	.00%	.00%
3. Assets seem to be undervalued	20.00%*	2.2%
4. The distribution of the assets is unbalanced during the separation process	13.30%	2.2%
5. The distribution of the liabilities is unbalanced during the separation process	.00%	.00%
6. The private company had a short lifetime	13.3%	2.2%
7. The private company is part of a network of corporates	86.7%*	42.2%
8. The company itself filed for bankruptcy	20.00%	11.1%
9. The board of directors changed short before the bankruptcy	6.7%	2.2%
10. The statutes change short before the bankruptcy	6.7%	6.7%

11. One or more directors were involved in the bankruptcy of themselves or other corporates	6.7%	2.2%
12. The administration is missing or incomplete	46.7%*	8.9%
13. The annual financial statements of the private company are not filed or inaccessible	40.0%	17.8%
14. There are private expenditures done at the expense of the private company	26.7%*	2.2%
15. Large parts of the assets are sold short before the bankruptcy	20.00%	6.7%
16. The notes seem to be feigned	20.00%*	.00%
17. There are payments that disadvantage creditors	13.3%*	.00%
18. Assets are sold under the market value	26.7%*	4.4%
19. Assets are only discovered after the bankruptcy	26.7%*	2.2%
20. Actio Pauliana has to be considered	66.7%*	20.0%
21. Illegal actions are discovered	26.7%*	2.2%

22. The private company filed for bankruptcy after an agreement with a lender	.00%	.00%
23. Too much staff was a reason for bankruptcy	6.7%	.00%
24. Former directors want to take over assets and liabilities	13.3%	4.4%
25. Restart of the company after the bankruptcy is considered	33.3%*	11.1%
26. Agreements have been reached between creditors of the old and investors of the new private company	.00%	.00%
27Activities of the private company are continued through a related corporation	13.3%	2.2%
28. The private company is sold to one or more old directors, who continue the activities of the private company	13.3%*	.00%
29. The private company changed its name short before the bankruptcy	20.0%*	2.2%
30. It is tried to gain a dismissal/dissolution order for large parts of the staff, short before the bankruptcy	6.7%	2.2%
31. Improper management seems to be	60.0%*	6.7%

a reason for the bankruptcy

* $p < .05$

Throughout the whole analysis a significance level of $\alpha = .05$ was handled. The independent samples t-test shows, that the total numbers of indicators differ significantly in the fraudulent ($M = 6.80$, $SD = 2.80$) and the non-fraudulent ($M = 1.64$, $SD = 1.36$) cases, $t(59) = 5.22$, $p < 0.0001$.

Through a chi-square test for all indicators, it is shown that some are significantly more often present in the fraudulent cases than in the non-fraudulent cases. The indicators that differed significantly in presence are highlighted with an * in Table 2. The first hypothesis is hereby confirmed.

With the help of that information, another checklist was set up, containing only the 14 indicators that seemed to be significantly more often present in fraudulent cases (see Appendix 5). It was used to check if the derived model was able to successfully predict fraud. The predictive power in fraud detection of those relevant indicators was checked against the second sample of fraudulent cases of bankruptcy. The frequency with which they occur is listed in Table 3. It can be seen, that the frequency of the indicators is consistently higher in the fraudulent, than in the non-fraudulent cases.

Table 3

Frequency of indicators, in analysis of predictive power (in total %)

Indicator	Present	
	Fraud	No Fraud
3. The assets seem to be undervalued	33.33%	.00%
7. The private company is part of a network of corporates	100%	44.40%
12. The administration is missing or incomplete	66.67%*	.00%
14. There are private expenditures done at the	33.33%	.00%

expense of the private company		
16. The notes seem to be faked	33.33%	.00%
17. There are payments that disadvantage creditors	66.67%*	.00%
18. Assets are sold under market value	33.33%	.00%
19. Assets are only discovered after the bankruptcy	33.33%	.00%
20. Actio Pauliana has to be considered	100%*	.00%
21. Illegal actions are discovered	66.67%*	.00%
25. Restart of the company after the bankruptcy is considered	66.67%	44.40%
28. The private company is sold to one or more old directors, who continue the activities of the private company	33.33%	.00%
29. The private company changed its name short before the bankruptcy	33.33%	.00%
31. Improper management seems to be a reason for the bankruptcy	33.33%	22.20%

* p < .05

The independent samples t-test reveals that the indicators are significantly more often present in the fraudulent cases, than in the non fraudulent cases, $t(10)= 13.91$, $p < .001$.

However, a chi-square test showed, that only the indicators 12, $\chi^2(1, N = 12) = 7.20$, $p = .007$, 17, $\chi^2(1, N = 12) = 7.20$, 20 $\chi^2(1, N = 12) = 12.00$, $p = .001$ and 21, $\chi^2(1, N = 12) = 7.20$, $p = .007$ occur significantly more often in the fraudulent than in the non-fraudulent cases, they are highlithed with an * in Table 3.

Survey

After conducting reliability analysis the questionnaire was found to be highly reliable (31 items; $\alpha = .86$). The importance, with which the participants weighted the different indicators of fraud, can be seen in Table 4. A General Linear Model ANOVA shows that there are significant differences in the importance of indicators, $F(1,30) = 13.912$, $p < .001$. The second hypothesis is thereby also confirmed.

Table 4

Average ratings of indicators

Indicator	M	SD
1. The shares are not paid	3.46	1.40
2. The account statements are missing	3.43	1.32
3. Assets seem to be undervalued	3.00	1.22
4. The distribution of the assets is unbalanced during the separation process	3.79	1.10
5. The distribution of the liabilities is unbalanced during the separation process	3.46	1.170
6. The private company had a short lifetime	3.43	.99

7. The private company is part of a network of corporates	2.89	1.26
8. The company itself filed for bankruptcy	2.18	1.22
9. The board of directors changed short before the bankruptcy	3.79	1.03
10. The statutes change short before the bankruptcy	3.43	1.32
11. On or more directors were involved in the bankruptcy of themselves or other corporates	4.18	.90
12. The administration is missing or incomplete	4.57	1.10
13. The annual financial statements of the private company are not filed or inaccessible	4.21	.96
14. There are private expenditures done at the expense of the private company	4.14	1.11
15. Large parts of the assets are sold short before the bankruptcy	4.50	.96
16. The notes seem to be faked	4.57	1.23

17. There are payments that disadvantage creditors	4.46	.92
18. The assets are sold under market value	4.64	.87
19. Assets are only discovered after the bankruptcy	3.71	1.30
20. Actio Pauliana has to be considered	4.11	1.03
21. Illegal actions are discovered	4.07	1.12
22. The private company filed for bankruptcy after an agreement with a lender	2.43	.92
23. Too much staff was a reason for bankruptcy	2.46	.88
24. Former directors want to take over assets and liabilities	2.68	.98
25. Restart of the company after the bankruptcy is considered	2.79	1.23
26. Agreements have been reached between creditors of the old and investors of the new private company	3.07	1.21

27. Activities of the private company are continued through a related corporation	3.82	1.33
28. The private company is sold to one or more old directors, who continue the activities of the private company	3.61	1.22
29. The private company changed its name short before the bankruptcy	3.04	1.04
30. It is tried to gain a dismissal/dissolution order for large parts of the staff, short before the bankruptcy	2.50	1.17
31. Improper management seems to be a reason for the bankruptcy	3.93	1.12

The pairwise comparisons, through applying Bonferroni intervals, show that the indicators 1, 4, 6, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 27 and 28 are the most important. Other differences in the assigned importance of the indicators lead to a classification on the basis of the number of more important indicators. Those range from 1 more important indicator in case of 5, 10 and 31 to 16 more important indicators in case of 8. The categories of importance of the indicators can be found in Table 5.

Table 5

Importance of indicators

Importance (1=highest to 10=lowest)	Indicators
1	1, 4, 6, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 27, 28

2	5, 10, 31
3	2
4	26
5	29
6	3, 25
7	7, 30
8	22
9	23, 24
10	8

After conducting an independent samples t-tests it is clear, that there are no significant differences in the rating of importance between men and women concerning the indicators. Furthermore there is no indication for a different rating, applied to the age of the participants. Whether they are above or below the average age, they tend to weigh the indicators as equally important. Also taking the work experience of the recipients into consideration does not lead to a significant difference in the assigned importance of the indicators.

Discussion

After the analysis of the results, the research question can be answered with help from the proposed hypothesis. The first hypothesis, stating that the indicators appear in different magnitudes, whether the case at hand is a fraudulent case or a non-fraudulent case is supported. There are some indicators that appear significantly more in the fraudulent cases, thus that are able to highlight fraudulent bankruptcies. Those indicators are: 3. Assets seem to be undervalued, 7. The private company is part of a network of corporates, 12. The administration is missing or incomplete, 14. There are private expenditures done at the expense of the private company, 16. The notes seem to be feigned, 17. There are payments that disadvantage creditors, 18. Assets are sold under market value, 19. Assets are only discovered after the bankruptcy, 20. Actio Pauliana has to be considered, 21. Illegal actions are discovered, 25. Restart of the company after the bankruptcy is considered, 28. The private company is sold to one or more old directors, who continue the activities of the private company, 29. The private company changed its name short before the bankruptcy, 31. Improper management seems to be a reason for the bankruptcy.

These findings partly support the findings of Veldkamp and de Vries (2008). However it did not became obvious, that the history of a criminal record and a change in the business practices seem to be an important indicator for fraud detection. This could be due to the nature of the investigated material. It is, for example, not necessarily stated in a bankruptcy dossier if the director of a company has a criminal record and how many times a court sentenced him. To assess this information it would be necessary to access criminal records of the directors or to conduct interviews with them, but even then social desirability could obscure the truth. Further it is not easily visible if a change in the business practice took place. To investigate this issue, a more detailed view on the company at hand is necessary. A convenient manner to do so would be to investigate annual reports of the institution under question. In addition to that study there are a couple of other indicators found to be important in detecting fraud. This can be due to the fact, that the study of Veldkamp and de Vries (2008) is already 6 years old and that the nature of fraud has changed with a growing social concern for the detection and prosecution of that crime.

The second hypothesis, stating that the curators do not assign the same importance to all indicators of fraud, is also confirmed. The analyses shed light on how they rate those indicators, resulting in 10 categories in which the indicators are spread. The following represent the most important indicators: 1. The shares are not paid, 4. The distribution of the assets is unbalanced during the separation process, 6. The private company had a short lifetime, 9. The Administration is changing short before the bankruptcy, 11. On or more administrators were involved in the bankruptcy of themselves or other corporates, 12. The administration is missing or incomplete, 13. The annual financial statements of the private company are not filed or inaccessible, 14. There are private expenditures done at the expense of the private company, 15. Large parts of the assets are sold short before the bankruptcy, 16. The notes seem to be feigned, 17. There are payments that disadvantage creditors, 18. Assets are sold under market value, 19. Assets are only discovered after the bankruptcy, 20. Actio Pauliana has to be considered, 21. Illegal actions are discovered, 27Activities of the private company are continued through a related corporation, 28. The private company is sold to one or more old directors, who continue the activities of the private company.

For a validation of the model it is important to compare the indicators most often present in the dossiers to the indicators rated most important from the curators. The initially proposed research question can thus be answered as follows: To improve the detection of fraud, considering important indicators, the focus of the curators have to be moved from those that they regard as most important in signaling bankruptcy fraud to those, that are found to be effective in distinguishing fraudulent from non-fraudulent cases. There is a fairly high correspondence of 9 out of 14 indicators between the ratings and the indicators that proved successful in highlighting fraud. However, there are four indicators that do not receive enough attention from the curators. Those are indicator 31, which can be found in the second most important category as well as 3 and 25, which are placed in the 6th category considering the importance and 7 and 30, which are only in the 7th. Likewise there are also a couple of indicators that are rated too important but that do not seem to be useful in signaling fraud, those are 1, 4 6, 9 11, 13, 15 and 27. It should be mentioned, that there were no differences in the rating of the indicators, regarding the demographic variables. The high reliability of the questionnaire also indicates, that curators tend to give similar answers to the questions raised. This is probably due to the fact, that their profession is connected to a high social responsibility and that it requires a high level of professionalism. Those two factors, pled for a good and above all continuing education that requires them to keep up to date with the latest developments in their field. There is no place for personal preferences or educational gaps, resulting from sticking to outdated knowledge. On basis of that information a model for fraud detection can be derived (see Figure 1).

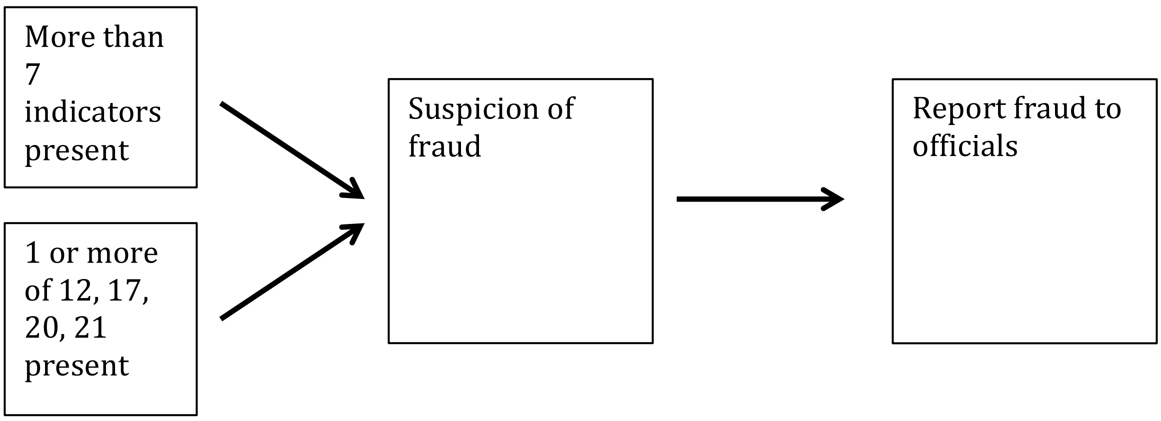

Figure 1 A model for fraud detection with the important indicators "12. The administration is missing or incomplete"; "17. There are payments that disadvantage creditors"; "20. Actio Pauliana has to be considered" and "21. Illegal actions are discovered".

The model shows where the attention, while considering a possible fraud, should be focused on. The chosen number of indicators that have to be present is linked to the average number of indicators present in the fraudulent cases. The second criteria that there is at least one indicator present that is shown to successfully predict fraud is chosen to guarantee that one of the indicators that distinguish predictively between fraudulent and non-fraudulent cases is present. Those indicators are: 12. The administration is missing or incomplete, 17. There are payments that disadvantage creditors, 20. Actio Pauliana has to be considered and 21. Illegal actions are discovered. If the curator stumbles upon some of those indicators, he should be suspicious concerning the activity of the company at hand. The curators rate all the indicators that successfully predict fraud as most important. They already apply a good focus, however, there are also other indicators that should be taken into consideration. The small sample of the predictive test could obscure the results and has a low distinctiveness. A bigger sample could show if there are other indicators significantly more often present in fraudulent than in the non-fraudulent cases. That means all the 14 indicators mentioned above, should still be taken into consideration, along with the fact, that there are significantly more indicators present in fraudulent than in non fraudulent cases. It was not possible to find more fraudulent cases of bankruptcy to validate the predictive power. Therefore, even if the model showed to be able to distinguish fraudulent from non-fraudulent cases only very few indicators seem to be significantly more often present in fraudulent cases. The predictive value of the model should be further analyzed in future studies, to answer the question: "Which indicators successfully distinguish between fraudulent and non-fraudulent cases?" more reliably.

Besides that major flaw in the current study, it also has some other limitations. With respect to the collection of the bankruptcy dossiers, several problems were present. First of all, it is very difficult to find a fraudulent case in the Internet. There are several articles in the media, that only state the branch and the location of a fraudulent bankruptcy, but often the name of the company is missing. Government officials usually refer to the confidentiality of the information when requested to send detailed information about bankrupt companies that were recently sentenced for committing fraud. To counteract that shortcoming, it would be advantageous to conduct research together with governmental institutions, to guarantee full access to all the information necessary. Furthermore, even if a case of fraudulent bankruptcy was successfully identified, it is not guaranteed, that the dossiers are available. Despite the fact, that this is publicly accessible information, it is often the case that the dossiers cannot or only partly be retrieved from the Internet. More cooperation from the side of the curators could help to gather data more exhaustively. The curators usually stated, that it would exceed their available time and resources, when requesting the missing dossiers. Cooperation from their side would result in a bigger sample size, which would have been very advantageous concerning the analysis of the predictive power of the model. With the access to more cases of bankruptcy fraud, it would also be possible to consistently match the fraudulent and non-fraudulent cases on more markers than branch and location, such as size of the company or monetary value involved in the bankruptcy. It is possible, that some information was not covered, due to missing dossiers. This flaw could be overcome by visiting the offices of the curators and to get insight in the dossiers they stored as paper files. Unfortunately this was not possible in the present study, because the curators were spread all over the Netherlands and the restricted time frame, as well as monetary limitations made it impossible to visit all the curators in person.

Regarding the survey, a major shortcoming was the low response rate, which consecutively resulted in a small sample. This is probably due to the fact, that the population generally has a very narrow time schedule and do not want do devote the highly valuable time to the questionnaire. Some participants also did not answer the whole questionnaire and stopped in the middle, maybe because they tried to answer it in a short break at work and something came in between or because they did not appreciate the potential usefulness of the study. Those questionnaires were excluded from the study. Some of the contacted persons also displayed some suspicion concerning the aim of the study. They stated that they are not willing to answer the questionnaire because they assume another purpose behind the request to take part in the study. This reached from suspecting another aim of the study to the thought that there is a journalist, trying to investigate substantial flaws in the approach to handle that highly sensitive social topic. Some even thought that they face a creative potential fraudster who tries to secure himself against prosecution, by researching the indicators that he has to avoid during the set up of a planned act of fraud. Those flaws could be counteracted by more personal contact with the participants, through conducting the survey via telephone to give the participants the possibility to directly answer their questions concerning the study. It would be also advantageous to conduct the answers in person in an interview, to guarantee even more personal contact with the subjects. This approach could enable them to build a trustful relationship with the researcher. Again the restricted time frame and monetary limitations as well as the fact that the participants were spread all over the Netherlands made it impossible to reach all participants in person. Conducting the survey via e-mail was thought to be the most convenient and efficient way to reach the participants.

To obtain greater depth of information on this topic, several approaches could be worked out further. More information could be gathered about the nature of the two major forms of bankruptcy, first the deliberate navigation of the company into bankruptcy and second the withdrawing of assets after the filing for bankruptcy to gain monetary advantages (Knegt, et. al, 2005). The cases of bankruptcy could consecutively be divided into those two groups, to investigate if there are any differences among those different forms of bankruptcy fraud, concerning the presence and importance of the indicators. Alongside with that approach it would also be possible to divide the sample of fraudulent bankruptcy cases on the hand of the three different modi operandi, the straw man approach, the voluntarily obscured company-structure and the opportunists (Tromp, et. al, 2008). Further investigation could reveal what the specific indicators are for frauds committed through those prevalently used approaches. With those differences at hand, the further investigation of a case could be made much easier. The prosecutor in charge would immediately know about the important characteristics he has to deal with. A possibility to gain the necessary information could be the conduction focus group interviews amongst different curators to discuss the different operating modes and subsequently analyzing the discussion. With that information, it would be possible to identify several markers that can classify a case of fraud as belonging to one of the earlier mentioned categories.

Further psychological research could address the mechanisms behind the indicators. An investigation thereof can reveal insight into specific behavior that leads to the presence of important indicators. Which desires beliefs or intentions lies behind specific acts of behavior that eventually manifests itself in the presence indicators, signaling a fraudulent act is a question that should be addressed. It would be beneficial to analyze what precisely constitutes fraudulent behavior as such and why people engage in it. One possibility to examine how those indicators are connected to psychological concepts, would be to investigate how the presence of those indicators is connected to narcissistic tendencies from the fraudsters
Rijsenbilt and Commandeur (2013) conducted a study, linking fraudulent behavior to narcissistic tendencies of CEOs in companies. An investigation of those tendencies compared to the presence of the fraudulent indicators, could yield insight into the personality of fraudsters. With that information it would ultimately be possible to make an inventory of the personality of fraudsters. Tendencies to commit bankruptcy fraud could be visible, even before a fraudulent act has been committed. Another approach to scan for possible fraudster would be to investigate different variables from fraudster who engaged in bankruptcy fraud. Zahra, Priem and Rasheed (2007) state that besides societal, industrial and organizational pressures a manager is faced with, the personal characteristics are very important for the disposition to commit fraud. Their study examined organizational fraud in general, but to apply this model to bankruptcy fraud would also yield insight in what kind of people engage in bankruptcy fraud and what pressures them to do so. This could extend the knowledge about the personality of fraudsters with additional information about their person and respectively the company they are engaged in. Furthermore Murphy and Decin (2011) propose, that fraud goes along three different psychological pathways, containing (1) a lack of awareness of fraud, (2) intuition and rationalization and (3) reasoning about fraud. For further research on

bankruptcy fraud it would be a good approach to investigate how potential fraudsters decide about the important indicators on each of the pathways. The questions here would contain “Am I aware that this behavior is fraud” (pathway 1), “Is it acceptable for me to commit this fraud” (pathway 2) and “Are the benefits greater than the costs of committing fraud” (pathway 3). At every point it could be investigated how potential fraudsters face the indicators that has shown to be important. It can also be investigated what could be done to change the beliefs intuitions and evaluations of potential fraudsters. Along each of those pathways it could be analyzed what yields to the consecutive decision to engage in or continue a fraudulent act. An intervention to lower the probability to commit fraud could be implemented at an early stage of this process.

To improve the introduced model of fraud detection it would be very helpful to add different kinds of data and different analysis approaches to the current one. It is recommendable to include the annual financial statements into the analysis and to apply data mining to them. Through the analysis of this additional data, other indicators that could distinguish fraudulent from non-fraudulent cases of bankruptcy could be found. Furthermore the bankruptcy dossiers could be analyzed by applying text mining, to see if there are differences in the structure and built up of the text concerning the presence or absence of fraud. Considering those implications for further research, the present model of fraud detection could be substantially extended, providing much more and diverse information, for detecting and classifying bankruptcy fraud (see Figure 2).

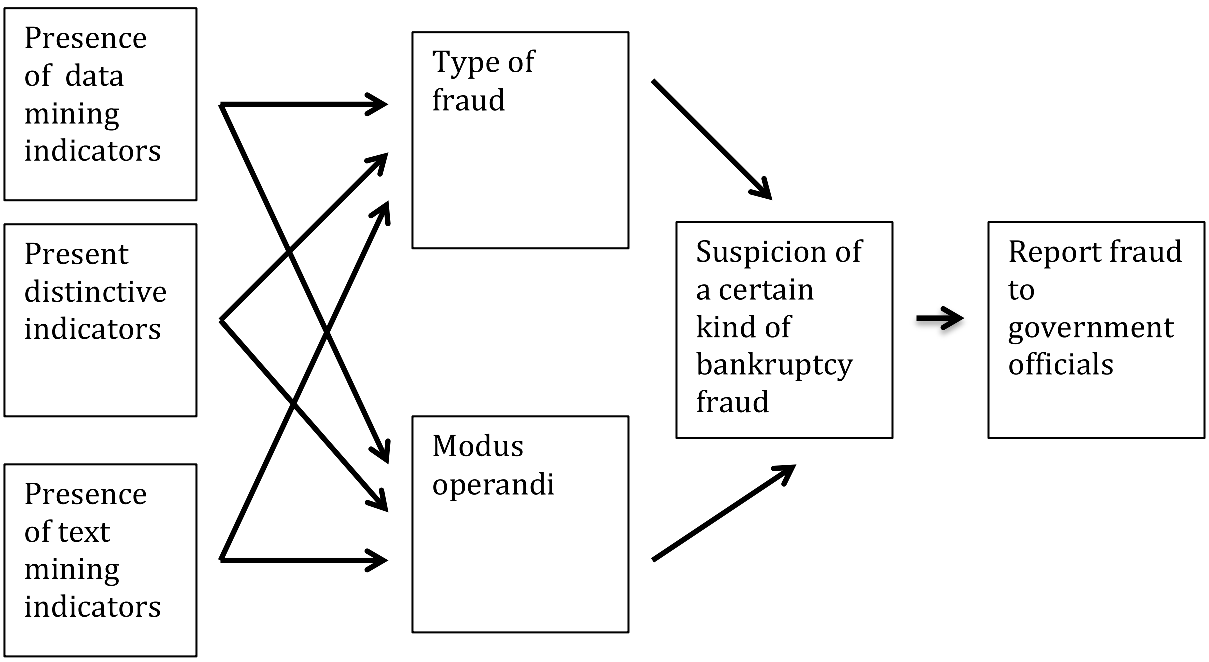

Figure 2 Proposed model for bankruptcy fraud detection

Based on this research it can be advised to the curators, to focus on the indicators that had been shown to be important in signaling fraud and to draw the attention from less important indicators. The best approach to guarantee a change of focus so would be a seminar, in which the curators are informed about, the outcomes of that study. This presentation should be followed by a course, teaching them how to use those indicators when working on a case of bankruptcy. The result of such an intervention would be that the curators are aware of a possible fraud early on in the process, which eventually would make fraud detection easier and more efficient. During the conduction of this study, it became obvious, that there is barely any research available that deals with the detection of bankruptcy fraud. There is a serious lack of scientific evidence, regarding detection strategies and the conduction of methods that can distinguish fraudulent from non-fraudulent cases of bankruptcies. Regarding this fact, and the fact that bankruptcy fraud ultimately harms the whole society, it is of tremendous importance, that in future, there will be more attention on this important topic, in society, as well as in the scientific world.

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Appendix

Appendix 1 Cases of Fraudulent Bankruptcies

1. The bankruptcy of this company was uttered December 30, 2013. The company was active in the transport sector, where it engaged mainly in the transportation of furniture. It employed 0-5 employees

2. The bankruptcy of this company was uttered October 6, 2012. The company was active in the telecommunication sector, offering and producing security solutions for the surveillance of children. It employed 5-30 employees.

3. The bankruptcy was uttered in 2004. The company was active in the industrial sector, where it developed produced and sold military vehicles. It employed 100-500 employees.

4. The bankruptcy was uttered July 20, 2006. The company is active in the telecommunication sector, where it offered digital surveillance solutions. It employed between 5 and 30 employees.

5.The bankruptcy was uttered September 22, 2009. The company was active in the professional services sector, where managed, produced and organized events, books, or CDs for artists, as well as for Television. It employed between 30 and 100 employees

6. The bankruptcy was uttered January 26, 2006. The company offered financial services, especially in the stock market. It employed 5-30 employees.

7. The bankruptcy was uttered May 11, 2009. The company was active in the professional service sector, where it sold rights for planting trees and subsequently gaining profits from the wood. It employed 0-5 employees.

8. The bankruptcy was uttered November 26, 2009. The company offered different financial services at the stock market. It employed 0-5 employees

9. The bankruptcy was uttered January 6, 2012. The company was active in the transport sector, where it shipped goods on behalf of customers. It employed 5-30 employees

10. The bankruptcy was uttered June 10, 2013. The company was busy in the industrial sector, where it installed heating system, air circulation systems and sanitary objects. It employed 100-500 employees.

11. The bankruptcy was uttered May 15, 2013. The company was active ein the retail sector, where dismantled cars and subsequently tried to sell the parts of the cars. It employed 0-5 employees.

12. The bankruptcy was uttered February 1, 2011. The company is a holding company for different other institutions. It employed 0-5 employees.

13. The bankruptcy was uttered October 19, 2010. The company was active in the real estate sector, where it sold houses in the order of customers. It employed 0-5 employees.

14. The bankruptcy was uttered May 28, 2013. The company was active in the retail sector, where it exploited retail stores, selling CDs, DVDs, and Computer games. It employed 5-30 employees.

15. The bankruptcy was uttered July 6, 2012. The company was active in the transportation sector, where it shipped goods on behalf of customers and rent machines to customers. It employed 30-100 employees.

Appendix 2: Cases of Bankruptcy for Analysis of Predictive Power

1. The bankruptcy was uttered January 9, 2007. The company was active in the transportation sector, where it shipped goods on behalf of customers. It employed 30-100 employees.

2. The bankruptcy was uttered January 20, 2005. The company was active in the industrial sector, where produced and sold textile goods. It employed 30-100 employees.

3. The bankruptcy was uttered January 10, 2007. The company was active in the industrial sector, where it produced, installed and sold air refreshing and acclimatization solutions. It employed 30-100 employees.

Appendix 3 Checklist for Bankruptcy Dossiers

Checklist for Bankruptcy Dossiers

Indicator	Present	Absent
1. The shares are not paid	☐	☐
2. The account statements are missing	☐	☐
3. Assets seem to be undervalued	☐	☐
4. The distribution of the assets is unbalanced during the separation process	☐	☐
5. The distribution of the liabilities is unbalanced during the separation process	☐	☐
6. The private company had a short lifetime	☐	☐
7. The private company is part of a network of corporates	☐	☐
8. The company itself filed for bankruptcy	☐	☐
9. The board of directors changed short before the bankruptcy	☐	☐

10. The statutes change short before the bankruptcy	☐	☐
11. On or more directors were involved in the bankruptcy of themselves or other corporates	☐	☐
12. The administration is missing or incomplete	☐	☐
13. The annual financial statements of the private company are not filed or inaccessible	☐	☐
14. There are private expenditures done at the expense of the private company	☐	☐
15. Large parts of the assets are sold short before the bankruptcy	☐	☐
16. The notes seem to be faked	☐	☐
17. There are payments that disadvantage creditors	☐	☐
18. The assets are sold under market value	☐	☐
19. Assets are only discovered after the bankruptcy	☐	☐

20. Actio Pauliana has to be considered	☐	☐
21. Illegal actions are discovered	☐	☐
22. The private company filed for bankruptcy after an agreement with a lender	☐	☐
23. Too much staff was a reason for bankruptcy	☐	☐
24. Former directors want to take over assets and liabilities	☐	☐
25. Restart of the company after the bankruptcy is considered	☐	☐
26. Agreements have been reached between creditors of the old and investors of the new private company	☐	☐
27. Activities of the private company are continued through a related corporation	☐	☐
28. The private company is sold to one or more old directors, who continue the activities of the private company	☐	☐

29. The private company changed its name short before the bankruptcy	☐	☐
30. It is tried to gain a dismissal/dissolution order for large parts of the staff, short before the bankruptcy	☐	☐
31. Improper management seems to be a reason for the bankruptcy	☐	☐

Appendix 4: Questionnaire for the curators

Hallo geachte dames en heren,

Mijn naam is Marius Braunsdorf. Op dit moment ben ik bezig met het afronden van mijn Bachelor studie Psychologie aan de Universiteit Twente. In het raam van deze studie doe ik onderzoek naar indicatoren van Faillissementsfraude. Het doel van mijn onderzoek is om er achter te komen wat voor indicatoren belangrijk zijn bij het signaleren van faillissementsfraude. Verder wordt probeert te achter halen hoe belangrijk deze indicatoren van curatoren worden geacht. De vragenlijst bestaat uit 31 items, waarbij voor elk item op een schaal van 1(helemaal niet belangrijk) tot 5 (Heel belangrijk) moet worden aangegeven hoe belangrijk u deze stelling acht.

De gegevens worden geheel anoniem verwerkt en u heeft op elke moment de mogelijkheid om zich uit het onderzoek terug te trekken.

Als u dat wenst, houd ik u graag op de hoogde van de resultaten van mijn onderzoek.

Met vriendelijke groet, Marius Braunsdorf

Wat is uw geslacht?	M V
Wat is uw leeftijd	XX jaren
Hoe lang bent u al als curator bezig (in jaren)?	XX jaren
Hoe belangrijk vind u de volgende aspecten (1=helemaal niet belangrijk tot 5 heel belangrijk)	
De aandelen zijn niet betaald	1 2 3 4 5
De accountantsverklaringen missen	1 2 3 4 5
De activa blijken ondergewaardeerd te zijn	1 2 3 4 5
De verdeling van de activa is onevenwichtig tijdens een afsplitsingsprocess	1 2 3 4 5
De verdeling van de passiva is	1 2 3 4 5

onevenwichtig tijdens een afsplitsingsprocess

De BV heeft een korte levensduur gehad	1 2 3 4 5
De BV maakt deel uit van een netwerk van rechtspersonen	1 2 3 4 5
Het faillissement wordt door de BV zelf aangevraagd	1 2 3 4 5
Het bestuur wisselt kort voor het faillissement	1 2 3 4 5
De statuten worden kort voor het faillissement gewijzigd	1 2 3 4 5
Een of meer bestuurders waren eerder bij faillissementen van zichzelf of andere rechtspersonen betrokken	1 2 3 4 5
De administratie ontbreekt of is onvolledig	1 2 3 4 5
De jaarrekeningen van de BV zijn niet gedeponeerd of ontoegankelijk	1 2 3 4 5
Er worden privé uitgaven ten laste van de BV gedaan	1 2 3 4 5
Grote delen activa worden kort voor het faillissement verkocht	1 2 3 4 5
Nota's blijken gefingeerd te zijn	1 2 3 4 5
Er worden betalingen verricht, die de crediteuren benadelen,	1 2 3 4 5
Activa worden onder marktwaarde vervreemd	1 2 3 4 5
Activa worden pas na het faillissement ontdekt	1 2 3 4 5
Actio Pauliana moet worden overwogen	1 2 3 4 5
Onrechtmatige daadsactie wordt ontdekt	1 2 3 4 5
De BV heeft het faillissement na afspraak/op	1 2 3 4 5

advies van een kredietverstrekker aangevraagd	
Personeel overschot was een reden voor faillissement	1 2 3 4 5
Voormalige bestuurders zijn van plan om activa of passiva overnemen	1 2 3 4 5
Er zijn overleggingen voor een doorstart van de BV na het faillissement	1 2 3 4 5
Er zijn afspraken gemaakt tussen crediteuren van de oude en investeerders van de nieuwe BV	1 2 3 4 5
Activiteiten van de BV worden voortgezet door een verwante rechtspersoon	1 2 3 4 5
De BV wordt aan een of meer oude bestuurders verkocht	1 2 3 4 5
De BV heeft kort voor het faillissement van naam verandert	1 2 3 4 5
Kort voor het faillissement wordt probeert om voor een deel van het personeel een ontslagvergunning/ontbindingsbeschikking te verkrijgen	1 2 3 4 5
Ondeskundig bestuur lijkt een reden voor het faillissement te zijn	1 2 3 4 5

Appendix 5 Checklist for test of predictive value

Checklist for predictive power

Indicator	Present	Absent
3. The assets seem to be undervalued	☐	☐
7. The private company is part of a network of corporates	☐	☐
12. The administration is missing or incomplete	☐	☐
14. There are private expenditures done at the expense of the private company	☐	☐
16. The notes seem to be faked	☐	☐
17. There are payments that disadvantage creditors	☐	☐
18. Assets are sold under market value	☐	☐
19. Assets are only discovered after the bankruptcy	☐	☐
20. Actio Pauliana has to be considered	☐	☐

21. Illegal actions are discovered	☐	☐
25. Restart of the company after the bankruptcy is considered	☐	☐
28. The private company is sold to one or more old directors, who continue the activities of the private company	☐	☐
29. The private company changed its name short before the bankruptcy	☐	☐
31. Improper management seems to be a reason for the bankruptcy	☐	☐