

A Review of:

Cole, Cassandra R., Enya He, and Kathleen A. McCullough (2011), “A Comprehensive Examination of Insurer Financial Strength Ratings.”¹
Barth, Michael M. and Robert W. Klein (2018), “Report on Calculation and Validation of Insurer Impairment Rates for Demotech, Inc.”²

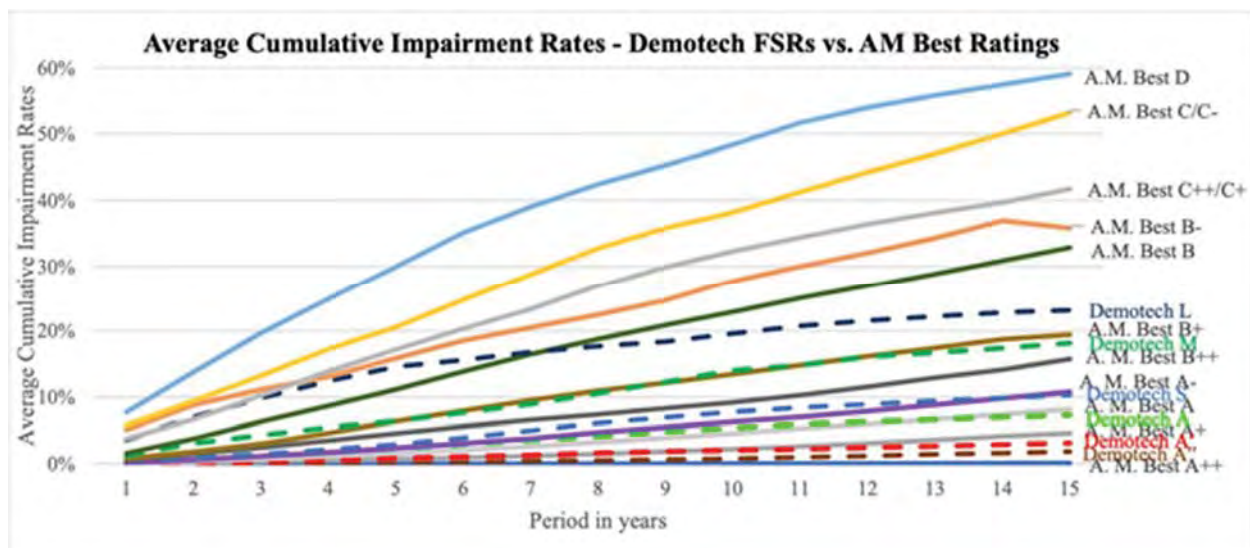
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Dr. Voss prepared a review of the examination and the report that had been prepared by Drs. Cole, McCullough, He, Barth and Klein. His review as a summary of his education and expertise follows. Conclusions excerpted from the report include:

1. Voss noted “By this measure, as judged by the criteria in Cole et. al. (2011), Demotech’s rating criteria are most similar to AM Best.”
2. “Equally impressive is that the underwriters [insurers] assigned Demotech’s S rating, which have been calculated and verified by Barth and Klein, are comparable to those underwriters [insurers] assigned an A.M. Best rating of A-.” [This is the outcome despite Barth and Klein using a more conservative static pool method to calculate our average cumulative impairment rates.]
3. The average cumulative impairment rates that are solid lines are those of A. M. Best. Lower is better when analyzing impairment rates.



... in addition to successful identification of underwriters at its A level, it is notable that the average cumulative impairment rates of underwriters assigned Demotech’s S rating, which have been calculated and verified by Barth and Klein, are comparable to those underwriters assigned A.M. Best’s rating of A-. Equally impressive is that underwriters assigned Demotech’s S rating have lower average cumulative impairment rates, i.e., a higher survival rates, than those assigned A.M. Best’s B++ rating. “

A Review of:

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¹available at [https://www.ey.com/Publication/vwLUAssets/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings/\\$FILE/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings.pdf](https://www.ey.com/Publication/vwLUAssets/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings/$FILE/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings.pdf), accessed June 30, 2020.

²available with permission from Demotech, Inc.

Background

Many insurance sectors including the trucking industry are faced with a crisis of insurability. This crisis is caused by several factors including nuclear legal verdicts and a reduction in the number of insurance underwriters willing to insure trucking companies. Greater risk combined with fewer insurance suppliers leads to higher insurance premiums, a factor cited in many recent trucking bankruptcy announcements.

Efforts are underway to improve both risk and insurance underwriter supply. The risk of nuclear verdicts can be reduced through improved safety management practices and tort reform. Increasing the supply of underwriters could be accomplished by accepting additional financially sound insurers to write trucking policies.

Trucking companies are required by shipping partners and regulatory agencies to maintain insurance coverage. Insurance rating agencies are tasked with determining the likelihood that underwriters have the ability to pay future claims. Insurance rating agencies include commonly recognized names such as S&P, Moody's, and Fitch as well as less recognized but just as important firms such as AM Best and Demotech, Inc. AM Best is likely the most widely accepted insurance rating agency. Demotech was founded in 1985 and, since 1989, has focused on the review and analysis of smaller, more regional insurance underwriters.

To the extent that a) AM Best prefers to certify larger insurance underwriters with broader geographic reach and b) trucking companies are forced to purchase insurance from AM Best certified carriers then c) trucking companies are deprived of the opportunity to purchase insurance products from smaller underwriters such as those rated by Demotech.

If AM Best prefers to rate larger insurance underwriters at the expense of smaller companies, it likely does so because larger underwriters are perceived to be more secure, i.e., larger asset reserves would improve the underwriter's stability and lessen the likelihood of underwriter impairment. Impaired underwriters are those that may not meet their future claim payment obligations.

However, if AM Best and Demotech use similar criteria to rate underwriters, then impairment likelihood should be roughly equivalent irrespective of underwriter size. Although smaller underwriters would likely cater to smaller trucking fleets, their participation in the marketplace would increase competition and drive down the price of insurance coverage.

As an academic member of the Arkansas trucking community, I was asked to provide my impressions of "A Comprehensive Examination of Insurer Financial Strength Ratings" (Cole et al. 2011) and "Report on Calculation and Validation of Insurer Impairment Rates for Demotech, Inc." (Barth and Klein 2018). These articles broadly compare criteria used by the major ratings agencies and document the similarity of AM Best and Demotech impairment rate outcomes.

Both articles are available either online or with Demotech's permission. As such, I will not delve deeply into either and would refer interested readers to the articles themselves. My primary goal is to give an opinion on their work.

This work begins with a review of Cole et al. (2011) then Barth and Klein (2018). An appendix is subsequently presented comparing longitudinal impairment rates for AM Best and Demotech rated underwriters.

A Review of:

Cole, Cassandra R., Enya He, and Kathleen A. McCullough (2011), "A Comprehensive Examination of Insurer Financial Strength Ratings."³

Cole et al. (2011) was published in *The Journal of Financial Perspectives: Insurance*. There is no journal description provided in the article's online version. The journal appears to be published by Ernst & Young's Global Financial Services Institute. I am unable to ascertain if the Journal employs a double blind peer-review process, which is the standard of trusted academic journals, but Ernst & Young is a well-regarded organization and I would tend to have faith in their editorial process. Further, based on their biographical information and curriculum vitae at the time of publication, the authors are qualified to conduct this research.

Cole et al. (2011) is based on the premise that two general types of ratings exist: unsolicited and solicited. Unsolicited ratings appear to be based on publicly available underwriter information. Solicited ratings appear to be based on additional, nonpublic information gathered by the rating agency.

Demotech provides a provisional (similar to unsolicited) rating to a large number of underwriters regardless of size or geographic coverage. Provisional ratings remain confidential unless the underwriter finalizes the rating. Demotech only publishes finalized ratings (similar to solicited).

The authors sought to accomplish several goals but determining criteria with the greatest influence on solicited ratings is most germane to this report.

Ordinal probit modelling, i.e. regression with an ordered dependent variable, is used to determine the influence of eighteen (18) criteria on underwriter ratings. The criteria are generally classified as organizational characteristics (5 criteria), business mix (4 criteria), business risk (5 criteria), and financial strength and flexibility (4 criteria).

Cole et al. (2011) examine both provisional (unsolicited) and finalized (solicited) ratings. They find that Demotech's ratings most closely resemble S&P and Fitch. However, they do not employ statistical inference to determine similarity.

The following table draws from Table 7 in Cole et al. (2011) and compares Demotech's finalized (solicited) criteria influence to that of the other ratings agencies. Note that the analysis below is my own and not contained in Cole et al (2011).

	DT	AM Best	S&P	Moody's	Fitch
Number of Statistically Significant Variables	17	13	15	9	14
Shared Significance with DT	17	13	14	9	13
Shared Significance and Valence with DT	17	11	8	6	7
Percentage Shared Significance and Valence	<u>17/17</u> 100%	<u>11/13</u> 85%	<u>8/14</u> 57%	<u>6/9</u> 67%	<u>7/13</u> 54%

³Available at [https://www.ey.com/Publication/vwLUAssets/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings/\\$FILE/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings.pdf](https://www.ey.com/Publication/vwLUAssets/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings/$FILE/ey-a-comprehensive-examination-of-insurer-financial-strength-ratings.pdf), accessed June 30, 2020.

As an educational sidebar, suppose a medical researcher wants to determine a drug's impact on cholesterol levels. The first question is, "Does the drug impact cholesterol?" If the drug has a strong enough impact, we would say it has a statistically significant influence on cholesterol levels. However, notice I did not mention *how* the drug impacts cholesterol. The drug could lower cholesterol or it could increase cholesterol. This directionality is called "valence."

Returning to the article, each agency uses their own criteria to rate underwriters. Cole et al. (2011), examined whether or not eighteen (18) criteria influence agencies' ratings. If a criterion sufficiently influenced an agency's rating, the authors indicated its influence was statistically significant. However, a criteria could positively influence a rating or it could negatively influence a rating. Again, this would represent valence.

The first row of the table above illustrates that seventeen (17) of the eighteen (18) criteria have a statistically significant influence on Demotech's (DT) ratings, thirteen (13) significantly influence AM Best's ratings, fifteen (15) significantly influence S&P's ratings, etc.

The second row notes the number of each agencies' statistically significant criteria that are also significant for Demotech. Obviously, all of Demotech's statistically significant criteria are significant for itself. Further, all thirteen (13) of AM Best's significant criteria are also significant for Demotech. S&P, Fitch, and Demotech shared a similar number of statistically significant criteria.

Statistical significance is important but does not tell the whole story. To determine whether agencies use criteria in the same way, valence must also be examined. Two agencies may use the same rating criteria but it can play completely different roles if it positively influences ratings for one agency and negatively influences ratings for another. The third row illustrates the number of those significant variables that are also significant for Demotech *and* share the same valence, i.e. positive or negative influence on the rating.

Finally, to determine how similar each agency is to Demotech, the final row divides the number of criteria that share both significance *and* valence with Demotech by those that only share significance. Of the thirteen (13) significant AM Best criteria that are also significant for Demotech, eleven (11) share the same valence. This is a higher percentage than any other agency.

For instance, of the eighteen (18) total criteria examined, fourteen (14) significantly influenced Fitch's ratings. Of those fourteen (14), thirteen (13) also significantly influenced Demotech's ratings. Of these thirteen (13) criteria, only seven (7) influenced Fitch's ratings in the same direction as they influenced Demotech's.

By this measure, as judged by the criteria in Cole et al. (2011), Demotech's rating criteria are most similar to AM Best.

A Review of:

Barth, Michael M. and Robert W. Klein (2018), "Report on Calculation and Validation of Insurer Impairment Rates for Demotech, Inc."⁴

This study was commissioned by Demotech and tracked the rating designations given to insurers on an annual basis from 1989 - 2016. No evidence is provided that this study has undergone any peer or editorial review but the results were reportedly submitted to the National Association of Insurance Commissioners as well as the respective departments of insurance. At the time the work was published, the authors were both employed by respected institutions and their biographical information indicates they are qualified to conduct this research.

The authors utilize Demotech data for the years 1989 - 2016 to uncover impairment rates for each rating to which Demotech assigns underwriters. Rating validity would be assumed if underwriters that receive higher ratings are less likely to be impaired overall and in comparison to lower rated underwriters. An insurance company was determined to be impaired, "...if it had been subjected to one or more formal regulatory actions for solvency reasons and this (these) regulatory action(s) were available from public sources" (p. 5).

Companies and data appear to have been appropriately screened. The authors utilize a more conservative static pool approach to analyze data.

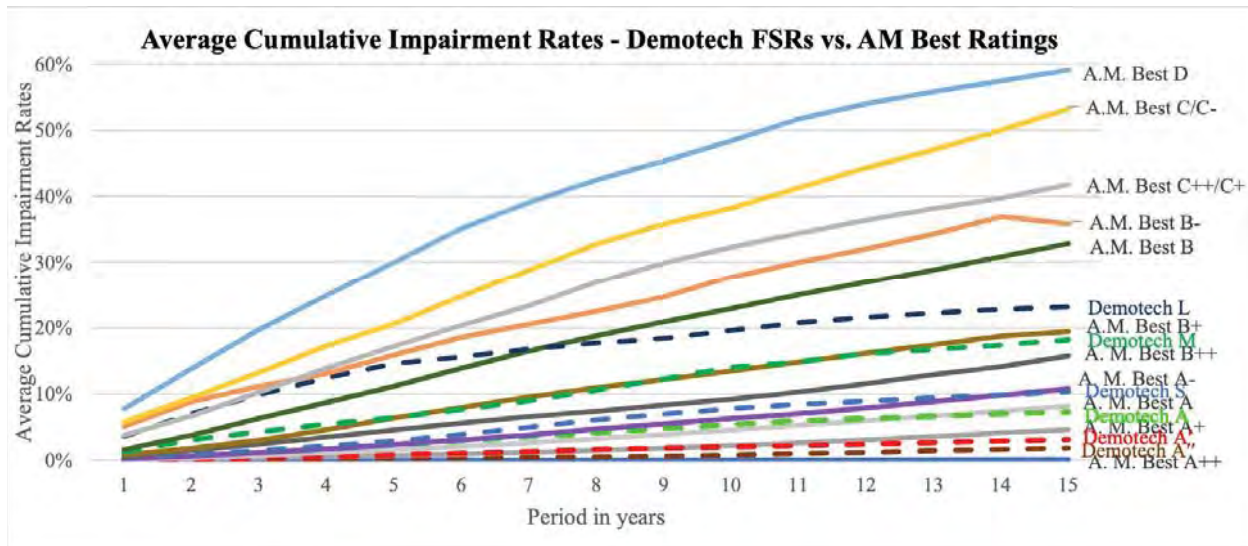
Demotech rates underwriters from most to least likely to be impaired as A", A', A, S, M, and L. Results indicate that Demotech's impairment rates are conservative and accurate.⁵

⁴Available with permission from Demotech, Inc.

⁵ The authors utilize survival rate, which equals 1.00 - impairment rate. I utilize the term impairment rate through this document for simplicity.

Appendix:

Data from Barth and Klein (2018) was subsequently compared with AM Best impairment rates and shared with me in a letter from Mr. Joseph Petrelli dated May 27, 2020. The following graphic compares average cumulative impairment rates for Demotech and AM Best.⁶



Assuming all data is correct, the graphic above would indicate that the impairment rates of highly rated Demotech underwriters are extremely similar to highly rated AM Best underwriters.

Further, in addition to its successful identification of underwriters at its A level, it is notable that the average cumulative impairment rates of underwriters assigned Demotech's S rating, which have been calculated and verified by Barth and Klein, are comparable to those underwriters assigned A.M. Best's rating of A-. Equally impressive is that underwriters assigned Demotech's S rating have lower average cumulative impairment rates, i.e., higher survival rates, than those assigned A.M. Best's B++ rating.

Given the difficult insurance market conditions associated with trucking insurance, liability and workers' compensation, third parties that expand their insurer selection criteria to include Demotech as a supplement to A.M. Best appear able to expand the choices available to the trucking industry while simultaneously selecting underwriters capable of providing the required protection.

⁶The source for the AM Best data was cited as "AM Best Co. - Impairment Rate and Rating Transition Study, October 31, 2017.