

430 North Salisbury Street
Raleigh, NC 27603
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National Association of Insurance Commissioners
2301 McGee Street, Suite 800
Kansas City, MO 64108-2662

“Why have my auto insurance rates doubled? I have never had an accident driving my piano.”

- Gwendolyn Anderson

Dear National Association of Insurance Commissioners,

I am an Associate of the Casualty Actuarial Society (1999) and a Member of the American Academy of Actuaries (2003). I have been a regulator for the North Carolina Department of Insurance since 2003. Credit scoring is legal in North Carolina, and I began reviewing proprietary insurance credit models in 2006 when the practice was relatively new. By statute, I am able to request support for credit scoring models. On many occasions, I have asked companies to make modifications to the models or temper the premium impacts. I would like to address the three issues the hearing is covering.

I. An explanation of what constitutes a credit-based insurance score.

The use of credit-based insurance scores may represent an innovative leap into the use of psychological evaluation of individual risk propensity in the pricing and underwriting of personal lines insurance. Credit-based insurance scores attempt to utilize individuals' personal “habits,” taken from financial records, as indicators of such things as future insurance losses and policy retention. I am in favor of innovation and scientific advancement. I would like assure market innovations are performed properly, to the benefit of communities and without harm to individuals. To devise a system of psychological risk assessment without involving a psychologist would be parallel to creating a hurricane model without a meteorologist or an earthquake model without a seismologist.

University bookshelves carry complete sections on financial credit scores, a fairly precise science that was developed over many years by financial experts. Review of credit is pertinent to obtaining a loan and is well accepted by the public. Yet in the insurance sector, the credit models are developed by statisticians who may observe only the correlations between credit characteristics and insurance results, and may rely strictly on computer outputs which in some cases they believe wholeheartedly. Many of the models in use today were not designed or evaluated by actuaries, who are trained to question data, evaluate its reliability, temper and correct for misleading results, and incorporate measures of credibility into the final selections. In many cases these models are designed for specific use in the insurance industry by people with absolutely no insurance background.

Financial Credit Scores

Most consumers are familiar with financial credit scores, which are used to evaluate a loan applicant. The scores are usually given as three digit numbers based on a formula calculation using information in a credit report. They rank consumers from least likely to most likely to be able to meet debt obligations.

Consumers with financial savvy know what has to be done to achieve a “good” credit score: debt obligations must be met on time, the debt-to-income ratio must be low enough to reasonably meet existing obligations or to take on new ones sought; there should not be collections, delinquencies, derogatory marks, or bankruptcies.

There are three major credit agencies which collect and store information on consumers’ financial transactions: Experian, TransUnion, and Equifax. The exact credit information that each agency collects may differ. Each agency has its own method of calculating a credit score. In addition to these agency scores, other companies have developed systems of scoring. The most widely known type of financial credit score is FICO which was developed by Fair Isaac Corporation.

Insurance Credit Scores

Insurance credit scores and their implications are vastly different from the financial credit score. They are not even intended to coincide with credit worthiness. Instead, various points are assigned to a selection of credit “habits” reflected in the credit reports. Consumers with “good” financial credit scores, who manage money well enough and drive safely, are not likely to suspect that insurance rates could double, triple, even quadruple based on their credit report information interpreted in novel ways. A few department store credit card purchases, applications for new VISA cards, a special use credit account to remodel the kitchen, or an automobile loan - all in good standing and all within the consumer’s means - could drive insurance rates sky high. So could the choice to simplify and pay cash.

Insurance credit scoring is a stronger indicator of future experience for consumers with clear driving records than it is for those with record marks. If a driving record shows points, those points are indicative of a chance of future loss. A driving record with no points offers little information, and that is where credit scores best fill in the gaps. Since accidents are somewhat random, the credit score is thought to help in distinguishing truly responsible drivers from those who have avoided a crash by dumb luck.

The use of credit in insurance allows credit agencies and other scoring companies to offer their product to a much broader range of customers. Creating new formula calculations involves a relatively small investment considering that the credit reports already exist and are readily available. Expanding the use of the credit reports into new markets could present enormous financial gains, especially to companies already in the credit reporting business.

II. An explanation of how insurers use credit-based insurance scores.

I believe that insurers calculate and use credit-based insurance scores:

- Improperly, to the detriment of some but not all insurance consumers
- Secretly, avoiding both scrutiny of the models and outcry from consumers
- In a manner that violates and interferes with basic rights of individuals
- Inexpensively, but certainly at the expense of consumers
- Incorrectly from mathematical, statistical, and actuarial perspectives

The improper calculation and use of credit-based insurance scores

Doctrine of False Cause

There exists no single specific reason why credit scoring is correlated to loss experience, but many intertwining reasons. When reasons are unknown or unclear, the “Doctrine of False Cause” should be well understood and contemplated. From Wikipedia:

“Correlation does not imply causation” is a phrase used in the sciences and statistics to emphasize that correlation between two variables does not imply that one causes the other. Its negation, *correlation proves causation*, is a logical fallacy by which two events that occur together are claimed to have a cause-and-effect relationship. The fallacy is also known as *cum hoc ergo propter hoc* (Latin for "with this, therefore because of this") and *false cause*.

As one example, a study found that people who have root canals are more likely to be diagnosed with cancer. Root canals could be a strong indicator of cancer risk, but are probably not the cause. People who smoke are more likely to have serious dental problems, and are known to be at greater risk for cancer. As a hypothetical illustration, suppose a life insurance company could not determine whether applicants smoked but could gain access to their dental records. The company’s profitability would improve by denying coverage to the applicants that had undergone root canals. The correlation could be proven, even while non-smokers who had undergone root canals would be unfairly grouped with smokers.

Causality

Insurers are quick to cite the “Risk Classification Statement of Principles” section on “Causality” which states that “characteristics ... need not always exhibit a cause and effect relationship.” In doing so, insurers ignore the greater part of the “Risk Classification Statement of Principles” which does not support most present applications of credit-based insurance scores. The “Risk Classification Statement of Principles” lists eight other considerations, some of which should enter the argument. Other considerations which deserve greater attention are homogeneity, the operational consideration of expense, avoidance of extreme discontinuities, manipulation, measurability, hazard reduction incentives, public acceptability, and controllability. A one paragraph excerpt of the “Risk Classification Statement of Principles” should not clear the way for any rating method lacking a plausible cause-and-effect basis.

Beyond the nine considerations, the primary purposes of risk classification and the basic principles may be neglected in focusing on the causality consideration.

The three primary purposes of risk classification are to:

- protect the insurance system's financial soundness;
- be fair; and
- permit economic incentives to operate and thus encourage widespread availability of coverage.

The five basic principles that serve to achieve these purposes are:

- The system should reflect expected cost differences.
- The system should distinguish among risks on the basis of relevant cost-related factors.
- The system should be applied objectively.
- The system should be practical and cost-effective.
- The system should be acceptable to the public.

Certainly, mention of fairness, relevant-cost-related factors, and public acceptability, are all of higher order in the "Risk Classification Statement of Principles" than the single consideration of causality.

Homogeneity

Homogeneity is a simple concept describing similarity among risks. In order to group risks together for setting a rate, it is desirable to have certain commonalities. Yet, no two risks are precisely alike and likeness can be viewed in various ways. So, homogeneity is simply a "consideration" in ratemaking. It is important to consider the similarity of groupings, although there can be no precise guide as to how alike risks should be. Yet when groupings are not homogeneous, the basic principles upholding a sound rating system are violated.

I would caution model developers who lean heavily on correlation without understanding the data under review. I have found even many actuaries to argue that results are only important "as a group." This is partly true, given that individual experience is highly random. However, the group must be appropriate and not erroneous for a classification system to be proper. If a high risk subset can not be identified with a certain amount of precision, then the penalty for those risks should be spread thinly throughout the entire population rather than heavily surcharging a nonhomogeneous grouping of risks that happen to have a false-cause characteristic in common.

A territory relativity results from hazards in the region, such as the degree of traffic congestion. Years of driving experience relate to skill, and can be logically determined from the original date of licensing. Homeowners may be grouped by age which represents maturity and to some extent lifestyle, and the grouping is achieved with precision, i.e. the number of years since the birthdate. Marks on the driving record are not precisely alike but are inarguably pertinent to driving. It does not make sense to surcharge a subset of drivers or homeowners who choose to hold retail credit cards, when Jonathan charged costly stereo and electronic equipment for parties at his apartment while Lydia charged at home improvement stores to remodel a historic home for her retirement. Even if the retail card grouping behaves similarly "as a group," the conditions for grouping these individuals are behavioral and there are marked differences in the behaviors. Modelers must demonstrate homogeneity for the system to be fair and valid. Note that in North Carolina, the insured's sex can not be used in ratemaking. Males can not be charged more than females even if "as a group," their collective loss experience is worse.

When I purchased a grand piano, I took out a loan and shortly afterwards refinanced. The two loans clearly impacted my insurance credit score, because upon renewal my automobile insurance rate was quoted as double. Paradoxically, my homeowners insurance premium with another carrier did not change upon renewal even though the value of contents increased. I told my auto insurance agent I never had an accident while driving my piano.

I realized I had been grouped with people that have a number of loans, many of which would be in tight financial situations. Clearly, this group of loan holders could include real estate investors and purchasers of yachts. Yet it could be surmised that the people in the greatest need of loans might create the heightened risk. These people may be less able to pay for losses “under the table,” may be more prone to accidents due to financial stresses, or may be more inclined to pad claims or submit fraudulent claims given personal funds are short. Whether the reason for the higher losses is known or unknown, it is in the greater interest not to find out the underlying reason if a surcharge to those with financial difficulties would be received negatively. By pooling the groups inappropriately, the reason for charging higher premiums is masked, and there is no appearance of discriminating on the basis of wealth.

Truth in Lending

Like the World Trade Center towers that were designed in the 1960’s to withstand the impact of the largest fully loaded passenger plane in operation at that time, the Truth in Lending Act of 1968 (TILA) was designed to protect consumers in credit transactions which existed at the time. It is no longer possible to physically explore the structural integrity of the World Trade Center towers because they were both taken down by fully loaded passenger planes.

In reviewing TILA for structural integrity, it would appear that Insurance Credit Scoring is not covered. Can it then be concluded that Insurance Credit Scoring does not violate consumer truth in lending rights? Keep in mind, the Insurance Credit Score produces a third party charge which was not a known use of credit at the time TILA was written. Instead of reviewing the precise wording of TILA to determine its application, it may be of more value to explore the intentions behind TILA, to evaluate what it had set out to do and what it had hoped to achieve.

Consumers need to be able to determine up front all costs associated with a loan, so they can effectively manage their finances. When a third party imposes unanticipated costs on the consumer for a financial decision, it oversteps the protections meant to ensure a stable financial future. Insurance is meant to be a tool for enhancing financial stability, by limiting unforeseen losses.

Disparate Impact

One of the earlier credit models I reviewed was submitted by Allstate for private passenger automobile insurance rates. When I requested changes to the original submission, Allstate provided a second model which ignores consumer “inquiries” (applications for credit). I approved its use in North Carolina. About a year later, I reviewed a third model submitted by Allstate for a homeowners filing, which I also approved for use in North Carolina. More recently, Allstate filed to replace the latter model with the one approved in the private passenger filing, demonstrating it to be similarly predictive of homeowners insurance losses. The requested change in model was a result of the DeHoyos Settlement in Texas. Jose DeHoyos had claimed that Allstate’s use of credit scoring had disparate impact on minorities, violating the Fair Housing Act. Allstate did not admit to any wrong doing, but agreed to use a different credit model in all states. No explanation was provided to me as to which aspect of the homeowners credit model was believed to have resulted in disparate impact. I do not know if the necessary changes to the homeowners model were pertinent to Texas only or to North Carolina as well. I was not able to

distinguish which characteristics in the homeowners model could result in disparate impact. I was not able to find a source that would willingly provide this information.

Secrecy in credit-based insurance scores

It is understandable that insurers would want to keep their scoring models a secret. The models are proprietary and may offer a significant market advantage. Companies do not want their models to be copied by other insurers. There may be concern that consumers will begin to change their credit habits in order to achieve a better insurance rate, lessening the insurer's ability to identify habits that are potentially linked to risk. Some credit models will not be effective in the long run if consumers are forewarned. Banks may begin to object to insurance credit scoring if the third-party charges for new credit diminish their markets; potential credit card customers may be dissuaded from "free" airline and hotel points offers after learning the of the possibility of markedly higher insurance costs.

Because secrecy is allowed, usually by statute, the public does not have any reasonable way of understanding how credit habits impact their premium rates. There have been few complaints against credit at the North Carolina Department of Insurance, and it is likely that lack of awareness prevents public outcry.

The acceptability of the use of credit partly rests on the well-established FICO score that applies to financial credit decisions. Most people who manage credit responsibly are able to obtain the loans they desire. It would seem that many people are offered too much credit, qualifying to purchase houses with monthly payments much higher than they would choose to make at a given income, and credit card limits that would be difficult to repay if fully utilized. It is natural for consumers comfortable with the financial system to presume that they will be similarly favored by insurance credit scoring, given that they have no way to learn otherwise. There is vast misinformation suggesting to consumers that good credit habits, in the familiar terms, will influence their premium rates positively, even while this is not the case.

I recommend that all insurance credit scoring models be made public. Consumers should be educated on managing finances responsibly. Everyone should be given the opportunity to plan for all costs associated with loans and other financial decisions. The reasons should not be provided in retrospect, but should be known to the consumer at the time they are able to modify choices in consideration of costs. Since driving records are not considered in ratemaking beyond three years, it seems reasonable that credit information should be similarly limited. It would not appear helpful for consumers to receive reason codes for credit choices they have no power to change for years to come.

In North Carolina, programs are undertaken to make people better drivers, such as "Click It or Ticket," which encouraged people to fasten their seat belts. People can learn to be better drivers, and can learn to better manage risks of all types. Such lessons are not learned under secrecy.

Basic consumer rights and credit-based insurance scores

Consumer rights should not be violated in any insurance rating system.

Consumers should maintain the right to defend themselves in court. Derogatory marks will influence FICO scores to an extent, but financial scores balance a large number of characteristics without giving great weight to an isolated event. Insurance credit scoring models may weight a single increment in a single characteristics strongly. A consumer should not have to pay its insurance company - an unrelated third party - a high monthly charge over a period of seven years, for contesting a charge in court. The court may be predisposed to rule partially in favor of each party. Note that a ruling in partial favor of the defendant will appear the same on a credit report as a flat ruling against the defendant.

Consumers should maintain the right to cancel a credit card at any time. The age of accounts can have a large impact on an insurance credit score. Age of accounts could also have a disparate impact on new immigrants, whose credit history in the United States would be shorter than most natives.

Consumer should have the right to keep credit limits low, not to carry credit, to pay cash, to maintain a credit balance, to seek credit or to accept offers of credit, and to choose any method of financing desired so long as debt obligations are honored as agreed. Consumers should be able to make financial choices without being charged a penalty by a third party. Such third party charges are unjustifiable, and impose a greater attack on financial freedom when the potential for such charges are hidden from consumers.

The cost of credit-based insurance scores

Consumers bear most of the costs associated with the inaccuracies in credit reports. It is their time and effort that is taken to correct report errors. Credit scoring is a fairly inexpensive method for insurers to classify consumers broadly in a manner that improves profits overall.

Fraud is cited as one possible reason that credit-based insurance works. People who commit fraud will tend to be dishonest and have marks on their credit records. While there are known indicators of fraud, there is not a definite way to distinguish people who commit fraud from those who do not simply by examining the credit report. The cost of fraud should be spread broadly and not imposed upon a smaller group of consumers, even if this means that prices would go down for “most people.”

Discounts

Insurers will argue that credit scores are used only to discount rates. Any discount offered requires that the overall rate level be raised. Every discount can be viewed as a surcharge to anyone not receiving that benefit. The only relevant fact is the differential in rates based on credit scoring.

Shoplifting example

Consider shoplifting in the United States. The National Association for Shoplifting Prevention (NASP) estimates that there are approximately 27 million shoplifters (or 1 in 11 people) in our nation today. The cost of shoplifting is spread through higher prices. Under this system, people who make large volume purchases might subsidize the costs more than those who make few purchases.

As a hypothetical example, consider three scenarios. In scenario A, shoplifters can not be identified, and the cost that each person incurs through price rises is divided evenly among all consumers. In scenario B, shoplifters can be identified perfectly, which allows the overall cost to be imposed on that group. Everyone who shops honestly pays a fair price, which would be the ideal situation. The great advantage is that the merchant can attract more customers at the fair market price of \$100, and even at \$105. In scenario C, shoplifters can not be identified perfectly, but broad lines can be drawn around them by certain identifying characteristics. In this way, the merchant may be able to attract more customers at a lower price, even while this involves charging an unfair price to consumers whose profile only resembles that of a shoplifter but who have never shoplifted in their lives. Under scenario C, where perfect information is unavailable, anyone who resembles a shoplifter is unfairly surcharged +55% above the fair market rate. It would be especially unfair to surcharge this group if many of them had experienced financial hardships that impacted their profiles. They would be bearing much more of the

burden of shoplifting than most other honest consumers. If shoplifters could not be perfectly identified, it would only be fair to spread the losses evenly across all consumers as in scenario A.

	Number of Consumers	(A) Price Paid	(B) Price Paid	(C) Price Paid
Actual Shoplifters	100	115	265	155
Profile Only Resembles Shoplifter	200	115	100	<u>155</u>
Not Shoplifters	800	115	100	100
Average Price		115	115	115

Proponents of credit scoring claim that in the absence of credit scoring, “most” insurance consumers are subsidizing others and would benefit from eliminating such subsidies. The shoplifting example demonstrates reasons broad subsidies can be important to maintain when perfect classification is not possible.

Logical Error: A => B means B => A

In formal logic, “affirming the consequent” is an error in which the conclusion is assumed a consequence of the premises. It is also called a converse error. For example,

If a person is in London, then that person is in England.
 A person is in England.
 Therefore, that person must be in London.

This type of a converse error could be common in insurance credit scoring. Insurance credit scoring models will sometimes assign a charge that does not apply well to the entire grouping.

Mathematical, Statistical, and Actuarial Errors

The Statistical R-squared

Statisticians use linear regression to fit lines that establish correlation between variables. A measure known as R² is used to identify how much of the relationship between the two variables is explained, as opposed to random. Statisticians may rely heavily on the R² value in developing a credit model.

The statistician is able to choose the combinations of cells, which allows the data to be altered along the x-axis. An upward and downward movement in the data can be eliminated through combination to produce an upward sloping line. To statisticians, the upward sloping line may be desirable to achieve. It will produce a higher R² value, and the data content of individual cells will increase with the larger groupings. It proves the relationship that was set out to be proven. This ignores that credible groupings could also have been selected that would produce a line that moves up and down, with a lower R² value. A larger problem is that a line may be projected out to the sparse tail of the curve where the fitted linear relationship may not exist.

The Number of Variables

Most models are based on a small number of credit characteristics. Some models appear to include many variables but give the bulk of the scoring weight to only one or two. Some models select the characteristics in order of some measure of “statistical significance,” removing the correlated effects of each subsequent characteristic. It would appear that these modelers seek the fewest characteristics as possible in order to simplify the model. In considering the error-prone nature of credit reports, a model which divides the effects among correlated characteristics would be better at tempering credit report errors. Giving weight to a few characteristics will overly emphasize random credit events and more harshly penalize individual choices reflected in a report. It would be desirable to include a large number of characteristics with no one receiving a large proportion of the weight. Extreme discontinuities appear commonly in credit models. Discontinuities defy any logic, when relating a credit report to future insurance losses. Each credit event should have a small incremental impact on the premium rate.

III. A discussion on how current economic conditions have affected policyholder premiums related to credit-based insurance scores.

There are different ways that insurers adjust for changes in credit reports. If the score is used in underwriting only, then the credit report is only utilized upon application for the insured’s placement. In pricing, the credit-based insurance score may be:

- calculated only upon initial application and the tier never updated
- calculated only upon initial application and eliminated from renewal pricing
- updated annually
- updated once every two years
- updated with a cap on the number of tier increments the score can move each year
- updated only at the request of the insured

In general, changes in credit as a whole will have a greater impact on consumers shopping for insurance for the first time, and on those seeking to change insurance companies. The ability to “shop around for a better deal” may be hindered under credit-based scoring.

Because insurance credit scores are not necessarily related to “good” credit or “bad” credit in the financial sense (eg. insurance credit scores may be unrelated to FICO scores), the current economic conditions impact on financial credit scores does not necessarily flow through to insurance scores in the same way. The characteristics that enter insurance credit models, and their weights, vary markedly. In some models, late payments or defaults will have little or no bearing. However, the financial habits of consumers are likely to change which would imply a change to insurance credit scores. Since insurance credit scores tend to rely heavily on the application for credit and the utilization of extended credit, consumers who continue to reliably honor debt obligations may still face rising insurance premiums even while maintaining solid financial credit ratings. Responsible consumers may be penalized with higher insurance premiums, charged by a third party for their efforts to steer through difficult times. A person who could typically manage a period of unemployment by tapping into available credit, may be hindered with inflated monthly bills. If financial stress truly is a factor that produces claims, then more accidents

and insurance losses can be expected to result from such a system. Insurance should protect people through periods where they fall randomly at a higher risk of loss. No insurance system should exacerbate the situations that lead to loss. Truly, insurance is a fundamental aspect of financial planning. It ought to behave as such through a temporary economic crisis.

The present state of the economy may not be the first topic that should be raised. Insurance credit scores do not appear to function properly in a stable economy. Any change to the economy represents only one corner of the area which should already be under repair.

A Well-Constructed Credit Model

A well constructed credit model would have the following attributes:

1. non-proprietary, available to the public to view
2. large number of characteristics
3. small incremental premium impacts for any one credit event
4. limited impact of any one characteristic
5. limit impact of credit overall
6. impact is split among various correlated characteristics
7. fitted lines flatten at the tails where data is sparse, rather than being projected upwards
8. Generalized Linear Models consider correlation of both credit and insurance variables
9. no penalty for lack of established credit
10. no penalty for credit choices, such as paying cash or accepting credit offers
11. limited time period of two or three years, like the DMV record, to allow insureds to improve credit over time.
12. closed accounts are not considered
13. assistance provided to insureds in correcting reports, for extended time periods
14. significant life events are forgiven, using credit prior to the event
15. assist insureds in understanding the model, in managing risk, in making smart financial choices, and in being safer drivers and homeowners
16. limit the incremental movement in credit tier at renewal, or update at insured's request only

Thank you for receiving my written testimony.

Sincerely,

Gwendolyn Anderson, ACAS MAAA
Associate Actuary
North Carolina Department of Insurance