



AMERICAN ACADEMY *of* ACTUARIES

THE USE OF CREDIT HISTORY
FOR PERSONAL LINES OF
INSURANCE:
REPORT TO THE
NATIONAL ASSOCIATION OF
INSURANCE COMMISSIONERS

**American Academy of Actuaries
Risk Classification Subcommittee of the
Property/Casualty Products, Pricing, and Market
Committee**

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Purpose

The American Academy of Actuaries is the public policy organization for actuaries practicing in all specialties within the United States. A major purpose of the Academy is to act as the public information organization for the profession. The Academy is non-partisan and assists the public policy process through the presentation of clear and objective actuarial analysis. The Academy regularly prepares testimony for Congress, provides information to federal elected officials, comments on proposed federal regulations, and works closely with state officials on issues related to insurance. The Academy also develops and upholds actuarial standards of conduct, qualification and practice, and the Code of Professional Conduct for all actuaries practicing in the United States.

The Risk Classification Subcommittee of the Academy is charged with assisting legislators, regulators, and other interested parties in evaluating actuarial practices related to the affordability and availability of insurance in urban areas and risk classification issues in general.

The Credit Scoring Working Group of the Market Regulation & Consumer Affairs (D) Committee of the National Association of Insurance Commissioners (NAIC) requested that the Risk Classification Subcommittee provide assistance to the Credit Scoring Working Group. Specifically, the Risk Classification Subcommittee was asked to provide the following support.

1. Review and critique four papers that have been published in regard to the use of credit history for rating and underwriting personal lines of insurance. These four papers are:
 - The Impact of Personal Insurance Credit History on Loss Performance in Personal Lines by James E. Monaghan (2000);

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- Insurance Scoring in Personal Automobile Insurance - Breaking the Silence by Conning & Company (2001);
 - Predictiveness of Credit History for Insurance Loss Ratio Relativities by Fair, Isaac (1999); and
 - Use of Credit Reports in Underwriting by the Commonwealth of Virginia, State Corporation Commission, Bureau of Insurance (1999).
2. Provide guidelines/parameters on how the NAIC could conduct a study of credit scoring, including suggestions on how the NAIC could determine (by study) causality (the relationship between credit history and risk of loss) and whether insurance scoring disproportionately affects protected classes and whether it disproportionately affects low-income groups.
3. Provide "best practices" that states could use in reviewing rating plans that use credit history in combination with other rating factors, for states that have prior approval rating laws.

This report provides our findings regarding items 1 and 3, and provides our initial advice and guidance in regard to item 2.

The subcommittee was not asked to evaluate the effectiveness of credit history as a tool in the underwriting and rating of personal lines of insurance, and therefore such an evaluation is not an element of this report. However, the subcommittee believes that credit history can be used effectively to differentiate between groups of policyholders and therefore it is an effective tool. This recognition is based on review of the four papers listed above, especially the Monaghan paper, and on the subcommittee's members' personal knowledge as obtained through the development and/or review of rating models based on credit history.

Review of Four Papers

Each of the four papers is reviewed. We first identify the major points and conclusions that are made in each paper, then review and discuss these major points and conclusions, and then provide an overall summary of the study.

Summarizing these papers very briefly:

- The Monaghan paper, written by an insurance company actuary, provides an analysis of the effectiveness of using credit characteristics to predict future loss ratios for private passenger automobile and homeowners insurance.
- The Conning & Company paper provides a disinterested overview of the use of credit history by personal lines insurers, based on review of the available literature and discussion with various parties.
- The Fair, Isaac paper, by a prominent provider of insurance scoring models, is a comprehensive response to issues that have been raised by insurance regulators and others in regard to the use of credit history.
- The Virginia Bureau of Insurance paper is a regulator's survey and discussion of the use of credit history in one state.

The Impact of Personal Credit History on Loss Performance in Personal Lines

James E. Monaghan; 2000

Study's Major Points and Conclusions

1. Eight credit information variables are identified which show strong power to predict loss ratios. This demonstrates correlation between certain credit information at the time a policy is written as new business, and future loss ratios.

The eight credit information variables are:

- Amounts past due
- Derogatory public records (bankruptcies, tax liens, civil judgments, and so forth)
- Collection records (generated when an account is referred to a collection agency)
- Status of trade lines (a "trade line" is a credit account or loan account)
- Age of oldest trade line
- Non-promotional inquiry count (number of credit inquiries arising from activity or request of the consumer)
- Leverage ratio on revolving type accounts (the leverage ratio is the ratio of debt to account limits)
- Revolving account limits

2. The statistical models do not demonstrate causality.

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Although the cause-and-effect relationships are speculative, there are reasonable causal links between credit characteristics and insurance risk.

Actuarial Standard of Practice No. 12 states that causality cannot be made a requirement for risk classification systems. It is sometimes impossible or impractical to prove cause-and-effect relationships. Risk classes should be neither obscure nor irrelevant, but they need not exhibit a cause-and-effect relationship.

The following list includes some examples of possible causal links between certain credit information and insurance loss experience:

- Maintenance: How responsibly one manages financial credit might also correspond to how they maintain and operate a car.
- Moral Hazard: How responsibly one manages financial credit might also correspond to how they maintain and operate a car.
- Claims Consciousness: Persons in certain financial situations might be more inclined to file claims.
- Fraud: Similarly, persons in certain financial situations might be more likely to be induced into fraud.
- Stress: persons in certain financial situations might be more stressed.

It is likely that all of these and other factors create a cumulative effect.

3. Multivariate analysis was performed and presented which demonstrates that different credit profiles predict different loss ratios, even when other factors (such as driving record, age of driver, and so forth) are held constant.

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Credit characteristics were compared by type of rating territory (urban versus other) in several states. This demonstrated that the distribution of credit characteristics by type of territory is relatively uniform. In other words, urban territories had approximately the same percentage of risks with poor credit characteristics as did other territories. Similar results were found for other underwriting criteria, including: number of vehicles, number of drivers, residence type, residence stability, job stability, prior insurance, gender, and marital status.

Multivariate analysis also was performed to demonstrate that there are many credit variables that have independent relationships with loss ratios

4. The study is extended to include an analysis of credit history versus homeowners insurance loss ratios, with similar results.
5. Whether or not credit information should be used. There are issues to consider other than loss performance.
 - Questions remain about whether credit information should be applied to renewals, and if so, how often should it be re-checked? Should premium be changed solely due to credit information? Each evaluation creates an inquiry in the credit file.
 - There is concern with using a classification variable that is “under the control of the insured.” In this case, however, it is doubtful that insureds would manipulate the class plan because they already are affected by their credit histories in other ways.
 - There is the need for a good measure of the accuracy of credit information. Insurers should inform customers of how to resolve inaccuracies, and then take into account any corrections.

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- Privacy concerns need to be addressed when considering the use of credit history in personal lines of insurance. Unlike the use of accident history, for which the negligence of the insured can usually be determined, a poor credit history is not necessarily due to negligence on the part of the insured.

Review and Discussion of Major Points and Conclusions

The study is based on data and information for new auto policies written by one insurance company in 1993 and the earned premium and loss information, for these policies from accident years 1993 through 1995. Credit information at new business time was matched with the experience data. Credit information was matched with premium and loss experience for 170,000 policies. Total premium volume was \$394 million. Credit information had not been used during this historical period for rating or underwriting.

Only new business was studied, so this study does not directly address renewal strategies, although there is no particular reason to think that the results would not generalize to renewal business. Credit information was collected only on the named insured, one person. As a result, the credit relationships might not be appropriate for recently married couples if each partner had different credit characteristics.

The author describes that drivers with past accidents and violations who are in the “best” group, as regards credit characteristics, have a lower overall loss ratio than do those good drivers who are in the “worst” group, as regards credit characteristics. In other words, he explains that for the purpose of forecasting future loss ratios, credit history is more important than past driving experience. However, the loss ratios of these two groups are probably not comparable because of the premium surcharges that would have applied to the drivers with past accidents and violations who are in the “best” credit group.

The author provides a comparison of urban and non-urban territories that shows no clear-cut difference in distribution of credit information by type of territory. This point may be valid. From an actuarial point of view, however, there is no need to have similar distributions of credit characteristics by type of territory. The value of the use of credit history is that it enables the insurance company to more equitably rate drivers within any given territory.

The section of the paper that discusses the multivariate analysis is important because it demonstrates that the credit characteristics are adding predictive power above and beyond the existing variables. It also demonstrates that a large number of credit characteristics are adding predictive power, *independent* of one another.

Summary Review of Paper

The Monaghan study has the following strengths and weaknesses.

Strengths

- The study uses loss ratio and multivariate analysis to demonstrate that the credit characteristics are adding predictive power, above and beyond the existing variables.
- The study provides a good discussion of causality and how it relates to actuarial standards.
- The study addresses public policy issues that are important to the acceptance of the use of credit history, beyond causality.

Weaknesses

- The database does not allow for the analysis of renewal business.
- The database is confined to the experience of one insurance company from 1993 through 1995.

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- The study was intended for a wide audiences, and therefore does not provide in-depth analytical detail. The multivariate analysis presented in the study is bivariate (two variables) and does not evaluate the importance of credit characteristics versus a combination of other rating variables.
- Many of the study conclusions are stated without providing the results of the underlying analysis. For example, tables are provided to demonstrate that credit characteristics do not appear to have a disparate impact by age of driver or by type of rating territory and then the statement is made that this also holds true for many other underwriting characteristics.

Insurance Scoring in Personal Automobile Insurance—Breaking the Silence

Conning & Company; 2001

Study's Major Points and Conclusions

1. In their underwriting and pricing process insurers seek to charge rates that are equitable, adequate and not unfairly discriminatory. These objectives are sometimes difficult to achieve because of regulatory constraints and insurers' own desires not to discriminate unfairly or act in a manner that is inconsistent with socially acceptable standards.

From the company perspective, pricing equity and accurate cost projections are crucial. Credit data can be used to create scores that in fact provide additional predictive information about future losses. However, using credit history is often perceived to be in conflict with what society considers as fair, particularly if the individual's score is affected by catastrophic events such as divorce, medical problems or loss of a job.

2. The use of credit data in decision-making, along with having more easily accessible and reliable data, has led to the rapid growth in automated underwriting systems that minimize subjective judgment by relying on more objective, rigorous, data-driven decision processes. Automated systems are more predictive, reliable and can improve the integrity of risk classification systems.

3. More than 90 percent of insurers responding (from the top 100 personal lines companies) indicated that they currently use credit data. The following also were found as a result of that survey:
 - More than 50 percent of these respondents began using it in 1998 or later.
 - Ten percent use it for pricing only; 38 percent for underwriting only, and 52 percent for underwriting and pricing.
 - Forty-six percent use the named insured with the highest score; eight percent use the average score for all listed drivers; and 15 percent use the named insured with the lowest score.
 - Seventy percent order scores for more than 75 percent of new applicants; ten percent order scores for between 50 and 75 percent of new applicants; five percent order scores for between 25 and 50 percent of new applicants; and 15 percent order scores on fewer than 25 percent of applicants.
 - Fourteen percent use credit history on annual renewal; 33 percent during re-underwriting, and 38 percent do not use it at all in the renewal process.
4. Scoring models have evolved through time. Today, they are more complex, hard to duplicate and difficult for consumers and regulators to understand. If not developed properly and maintained, they have the potential to create long-term legal, social and financial problems for insurers.
5. Insurers appear to be focusing their use of credit data and insurance scoring on four strategic goals: (1) more refined risk classifications; (2) customer valuations to drive target marketing; (3) pricing and underwriting proficiency; and (4) increased retention.

To the extent that insurance scoring can predict which insureds are more likely to have a loss, it can minimize subsidies between classes. The objective decision-making embodied in

the use of insurance scoring makes the evaluation of customers for direct marketing easier and more pointed. The scoring systems have been derived to match actual loss ratio performance to risk characteristics and sort through the data and price more efficiently. The use of these models has allowed companies to compare results for profitable customers and thereby target renewal discounts to retain the more profitable customers.

6. The use of credit data in underwriting and pricing of personal automobile insurance has sparked an intense debate that centers mostly on the following factors relating to statistical correlation between credit data and loss ratio: (1) benefits to consumers, (2) discrimination, and (3) socially acceptable criteria.

There are at least three studies that show a statistically significant relationship between credit data and loss ratio performance. These studies show that this correlation can change in time – but this correlation, however strong, cannot establish a causal relationship. The use of credit data has allowed insurers to establish that some insureds, traditionally classified as “standard,” can qualify as “preferred” when evaluated by these models. Studies have shown that even insureds with prior violations or accidents but having good credit behavior can have better loss ratio performance than insureds who have no accidents or violations but who have poor credit.

The debate about the social acceptability of credit has been the subject of at least five studies. Based on these studies, the author notes that the evidence about the relationship of credit to income is mixed, but not conclusive, and may reflect differences by ethnicity and socioeconomic group.

The authors also looked at various credit parameters, ranging from the less severe (payments more than 60 days delinquent) to the more severe (bankruptcy), for which data were available from secondary sources. Based on these parameters, they found:

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- If a key measure of credit quality is having a debt payment that is 60 days or more past due, then it seems reasonable to conclude that the use of credit characteristics has a disparate impact on lower income households.
- There is a significant variance between the mean and median income of bankruptcy filers (at the time of bankruptcy) compared to the state's mean and median income.

With regard to the accuracy of credit data, Conning looked at various major studies compiled regarding the accuracy. These studies included compilations by *Consumer Reports*, *USA Today*, *U.S. News & World Report*, and the Public Interest Research Group. Each of these studies showed high percentages of errors but none of the studies made any attempt to measure the impact of using the data. Additionally, Conning identified the source of errors, including applicants themselves, store personnel, failure of creditors to report data, and an increase in the incidence of identity theft. While the available data leads to the conclusion that the data itself is not completely accurate, the degree of inaccuracy is difficult to determine due to the differences in definitions used by proponents and critics.

7. To minimize risks associated with the use of credit data, insurers must proactively educate three key stakeholders: consumers, regulators and distributors. Consumers are increasingly concerned about how personal information is being used. They are concerned that inaccurate information may be used to deny them insurance. These concerns are disparate and significant when examined by ethnic group. Conning believes that these facts are an issue with which insurers need to be concerned.
8. The convergence of the financial services sectors, although not advancing as rapidly as initially expected following enactment of the Gramm-Leach-Bliley Act, will present insurers with both opportunities and challenges in connection with their use of credit data and insurance data. Opportunities exist in coordinating multi-line underwriting decisions, cross-selling of other financial products and enhanced retention, response, and referral. Challenges

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will arise in assessing the value of the models to enhance the competitive position of insurers as they get more complex. They will also make it harder for insurers to know their competitive position. The hiring of staff skilled in developing and enhancing these models will become more difficult. Additionally, the perception of these models as “black boxes” will lead to increased pressure to open them to the regulators and consumers, while seeking to maintain the intellectual property and confidentiality in order to sustain a competitive edge.

Review and Discussion of Major Points and Conclusions

The authors reviewed existing literature and discussion about the use of credit scores, and attempted to summarize its findings. They did not conduct original research and therefore it is difficult to critique their individual findings. In our opinion, the authors’ findings are reasonable and provide a good overview of the issues.

Summary Review of Paper

The Conning study has the following strengths and weaknesses.

Strengths

- The authors are unbiased observers and have reviewed the arguments offered by each side and attempted to evaluate the validity of the claims.
- The authors appear to have conducted a thorough analysis of the available literature and interviewed insurers and agents about the use of credit.
- The Conning study concludes that the use of credit information has merit because it appears to have a correlation to loss ratio performance and does not appear to overlap other

variables used by insurers. However, it is unable to eliminate the possibility that scoring models do not have a disparate impact related to income level.

Weaknesses

- Research is all secondary with regard to the technical questions about relationship to loss ratio and potential disparate impacts based on income or ethnic group. The authors are drawing their conclusions based on a review of studies and analyses produced by others. As a result, they cannot evaluate the methods by which the data was compiled.
- The Conning study neither discusses the methods used to develop the models nor gives a thorough presentation of how companies are actually using the models.
- The study does not distinguish between score-based or rule-based models in application. The rule-based model gives a set of conditions that result in either a credit or surcharge for each condition that is present or absent. A score-based model will provide an aggregate score resulting from all of the risk parameters but does not permit the recipient of the score to understand which items were the drivers of the score.
- The study does not discuss the possible differences between univariate and multivariate models.
- The authors do not investigate whether or not the initial segregation of risks in model development such as preferred, standard, or non-standard categories, perhaps produces disparate impact.

Predictiveness of Credit History for Insurance Loss-Ratio Relativities

Fair, Isaac; 1999

Study's Major Points and Conclusions

1. The accuracy of credit data should not be a matter of concern.

If credit data were widely inaccurate, scores also would be inaccurate. The fact that insurance scores are so predictive of insurance loss performance testifies to the overall accuracy of the credit information.

Several studies are referenced that show very low error rates for credit data. In fact there are much lower error rates than motor vehicle reports (MVRs), which are readily accepted and routinely used for auto insurance.

2. The Fair Credit Reporting Act (FCRA) permits the use of consumer credit reports for underwriting insurance. It gives consumers certain protections, including notification requirements, free access to their credit reports, and in the case of an adverse action based on a consumer report, correction procedures.
3. Specific credit variables and model scores are highly effective at predicting insurance loss ratio relativities.

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The Fair, Isaac study gives examples of five specific credit variables and how they are related to personal property and automobile insurance loss ratios. The credit information further separates insurance policies by loss ratio above and beyond the separation that is provided by the other rating variables that are commonly used. The actual model scores also are very effective at predicting loss ratio relativities. Fair, Isaac commissioned Tillinghast-Towers Perrin to validate the relationship. (1996 paper, appended to NAIC white paper.) The general statistical techniques are well known but the exact models are proprietary.

4. Statistical models do not determine causality. Statistical techniques demonstrate statistical relationships, but do not determine causal relationships. But in other fields, such as medicine, the discoveries of statistical relationships have been considered valuable and useful, even without the establishment of causal relationships. One can speculate that those who manage their credit risk well also may manage their insurance risk well.
5. The Fair, Isaac scoring models are not unfairly discriminatory. In compliance with the Equal Credit Opportunity Act (ECOA) and the Fair Housing Act (FHA), the Fair, Isaac scoring models avoid the use of many factors, including: income, location, nationality, net worth, race, color, religion, and disability.

A study by the American Insurance Association concluded that using insurance scores does not discriminate against low-income groups, and that insurance scores are not significantly correlated with income.

6. The use of Insurance Bureau scores (scores based on Fair, Isaac models) enables insurers to improve the speed, objectivity, and consistency of their underwriting.

Insurance Bureau scores are used by many insurers in the United States and Canada. Insurance Bureau scores are widely available, so they enable insurers of all sizes to use credit

information with efficiency, objectivity and consistency. Because they are objective, their use can eliminate subjective human judgment.

Scores can be used for the following multiple purposes:

- Underwriting evaluation for various insurance programs;
- Sales management (for example, by monitoring the average scores by agent);and
- Management information (for example, monitoring changes in average scores).

7. Credit scores, unlike Insurance Bureau scores, were developed to predict credit risk and are not appropriate for the purpose of predicting insurance risk.

Review and Discussion of Major Points and Conclusions

1. The accuracy of credit data should not be a matter of concern.

This conclusion is based on studies by Arthur Andersen (for the Associated Credit Bureaus), TransUnion (a credit report company), and a comparison with the accuracy of motor vehicle records (MVRs), which was evaluated in a study by the Insurance Research Council.

There are many ways to evaluate the accuracy of credit data and these studies are just a few. It is unclear in the TransUnion study, for example, how many important credit report inaccuracies might have gone undisputed.

Further, the error rates measured by the credit data studies and the MVR study are not directly comparable. Fair, Isaac states “In view of the error rate of MVRs, the credit report error rate should not be an issue,” but this seems to be too strong a conclusion.

2. FCRA permits the use of consumer credit reports for underwriting insurance, and gives consumers certain protections, including notification requirements, free access to their credit reports, and in the case of an adverse action based on a consumer report, correction procedures. Evaluation of the legal ramifications of the FCRA is outside the scope of this review.

3. Specific credit variables and model scores are effective at predicting insurance loss ratio relativities. The Fair, Issac study provides many results (statistical relationships), showing that both individual credit characteristics and insurance scores are closely related to loss ratios. However, little or no in-depth data analysis is directly included in the paper, and therefore it is not possible to comment on the validity of these results. For example, Fair, Issac's conclusions regarding loss ratios are based on the implicit assumption that all other elements of the rating structure are correct, meaning that all groups of consumers would have identical loss ratios if it were not for their different credit scores. To the extent that there are overcharges and undercharges in the rating plans (due to factors other than credit rating), this could distort the indicated credit score differentials. There is also a potential for distortion due to the fact that not all companies use the same rating plan or have the same overall loss ratio. These possibilities would have been explored more carefully in a more in-depth study.

4. Statistical models do not determine causality. This is an appropriate conclusion. It should not be necessary to demonstrate causality. Actuarial Standard of Practice No. 12 states that causality cannot be required for risk classification systems. It is sometimes impossible or impractical to prove cause-and-effect relationships. Risk classes should be neither obscure nor irrelevant, but they need not exhibit a cause-and-effect relationship.

5. The Fair, Isaac scoring models are not unfairly discriminatory. The Risk Classification Subcommittee accepts Fair, Isaac's statement that its models do not use certain factors

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including income, location, nationality, net worth, race, religion, and disability. There is no way for the subcommittee to verify this statement without reviewing Fair, Isaac's models. However, this statement cannot be generalized to other models that are in use. Also, the paper does not address the question of whether or not any of the credit variables used, or the overall insurance score, might be a surrogate or a proxy for any prohibited factor or factors. Our subcommittee has not reviewed the study by the American Insurance Association that is cited by Fair, Isaac.

6. The use of Insurance Bureau scores (scores based on Fair, Isaac models) enables insurers to improve the speed, objectivity, and consistency of their underwriting. The Insurance Bureau scores most likely enable insurers to improve their underwriting in this way, but no evidence is presented to indicate that insurers use the Insurance Bureau scores in an objective and consistent manner.

7. Credit scores, unlike Insurance Bureau scores, were developed to predict credit risk and are not appropriate for the purpose of predicting insurance risk. Although this was not a major point in the Fair, Isaac study, the distinction between credit (lending) scores and insurance scores is important. The study does not present any information about the relationship between credit scores and insurance scores.

Summary Review of Paper

This study, by a prominent provider of insurance scoring models, is a response to issues that have been raised by insurance regulators and others in regard to the use of credit history for insurance underwriting. It provides a comprehensive review of these issues, but does not provide any in-depth analysis or discussions of the underlying insurance scoring models. It has the following strengths and weaknesses:

Strengths

- The study provides a good practical description of how and why insurance companies use insurance scores.
- The study discusses issues of concern, such as causality, data accuracy, FCRA, discrimination, and the difference between insurance and credit scores.
- It provides understandable results showing how loss ratios are related to credit variables and insurance scores.

Weaknesses:

- The study provides little description of the underlying data analysis.
- It does not provide any multivariate analysis, to determine if credit history might be essentially replacing another variable.

Use of Credit Reports in Underwriting

Virginia Bureau of Insurance (1999)

Study's Major Points and Conclusions

1. Approximately 50 percent of auto insurers and 60 percent of homeowners insurers responding to the Virginia Bureau of Insurance survey use some form of credit scoring with new business underwriting, representing 36 percent and 49 percent of the respective market shares in Virginia.
2. Of the insurers using credit history, roughly 30 percent may decline new business solely on credit history, and one percent may non-renew solely on credit history.
3. There is a statistical correlation between credit score and policy loss performance.
4. Credit scoring is an ineffective tool for "redlining" because income and race alone are not reliable predictors of credit score.
5. The level of consumer complaints involving the use of credit reports is very low (less than one percent of all complaints). However, the Virginia Bureau of Insurance is concerned that the number of complaints, new business declinations, and non-renewals will increase as more insurers use credit reports.
6. Almost two-thirds of agents (63 percent) responding to a bureau survey were in favor of a law prohibiting insurers from refusing to issue or renew policies due to adverse credit reports.

7. None of the credit variables used in the Fair, Isaac models appear to be unfairly discriminatory.

Review and Discussion of Major Points and Conclusions

1. Approximately 50 percent of auto insurers and 60 percent of homeowners insurers responding to the Virginia Bureau of Insurance survey use some form of credit scoring with new business underwriting, representing 36 percent and 49 percent of the respective market shares in Virginia. This conclusion was based on a survey of the following:

- A) Top 100 Virginia market share auto insurers (89 percent of the market responded).
- B) Top 100 Virginia market share homeowners insurers (82 percent of the market responded).

The conclusion is probably a reasonable estimate of what the market is doing. However, there may be a bias in responding. For example, companies using credit scoring as a potentially sole criterion for the acceptance or rejection of a potential policyholder may have tended to decline to respond. Also, since the actual survey is not part of the published paper, it is not possible to assess how to fully assess the responses. Also, it is difficult to project the findings forward in time to 2002, because companies have had more opportunity to respond to the marketplace and to decide how best to use credit history.

2. Of the insurers using credit history, roughly 30 percent may decline new business solely on credit history, and one percent may non-renew solely on credit history. (See comments regarding item 1)

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3. There is a statistical correlation between credit score and policy loss performance. This conclusion was based on company filings in which there was a proposal to use credit score as a factor in rating. The study includes no actual data, so it is not possible to comment on the quality of the supporting evidence. The fact that there were at least 50 survey respondents using credit history, who apparently submitted filings with appropriate support for the use of credit history, indicates that there is a correlation. The inclusion of some summarization of data seen by the bureau of insurance would have strengthened this study.
4. Credit scoring is an ineffective tool for “redlining” because income and race alone are not reliable predictors of credit score. This conclusion is based on the following:
 - A) TransUnion data apparently consisted of credit scores aggregated by Virginia ZIP codes and;
 - B) 1989 Census data by ZIP code apparently included average household income and racial mix.

The data is reviewed on an aggregate basis, by ZIP codes, and there is no attempt to match the credit scores of individual consumers with their income and race. As with item 3 the paper does not include any of the supporting data, so it is not possible to comment directly on the conclusion. The level of consumer complaints involving the use of credit reports is very low (less than one percent of all complaints). However, the Virginia Bureau of Insurance is concerned that the number of complaints, new business declinations, and non-renewals will increase as more insurers use credit reports. This conclusion is based on telephone and written complaints received by the Bureau’s Property and Casualty Consumer Services Section during a five-month period, March to August of 1999.

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The implication is that the insurance buying public does not perceive a problem. Less than one percent of complaints seems low, but as the bureau indicates in the study, there is insufficient information to conclude whether or not this level will be maintained.

Furthermore, even if the level of complaint increases significantly, it will be difficult to assess what it means because using credit reports will, by design, adversely affect a significant number of consumers.

5. Nearly two-thirds of agents (63 percent) responding to a bureau survey were in favor of a law prohibiting insurers from refusing to issue or renew policies due to adverse credit reports.

This conclusion is based on a survey of 1,129 agents.

It is not clear that the 63 percent is representative of agents in total. Because of this there may be a greater tendency for the strongly opinioned to respond to the survey. For example, since it is not stated in the paper exactly how the survey was conducted, it is not known to what degree there was follow-up with the non-responding agents.

6. None of the credit variables used in the Fair, Isaac models appears to be unfairly discriminatory. The basis for this conclusion is not clear. There was at least one interview with representatives of Fair, Isaac, and the study seems to contain the suggestion that the Bureau was allowed to see the actual list of credit variables used by Fair, Isaac.

It is not possible to verify this conclusion, because its basis is unclear. Further, the conclusion appears to apply only to Fair, Isaac models and there is no information regarding the variables used in other insurance scoring models.

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Summary Review of Study

The Virginia Bureau of Insurance (1999) draws some significant conclusions about the use of credit history in the underwriting of auto and homeowners insurance in Virginia. These conclusions are based upon data from rate filings and TransUnion, and several surveys implying reliability and thoroughness.

Because the paper includes only a limited amount of the data, however, it is difficult for readers to assess the validity of the conclusions. The inclusion of some summarized data displaying the correlation between credit score and loss performance, and data supporting the ZIP code analysis, would have strengthened the study.

Recommendations Regarding a Study by the NAIC

Causality

The NAIC asked that the subcommittee provide advice for how the NAIC could conduct a study to determine causality between credit history and risk of loss. The Risk Classification Subcommittee does not recommend that the NAIC conduct a study to determine if there is a *causal* relationship between credit history and future insurance claims experience, because in our opinion it would not be possible to prove a *causal* relationship. The NAIC could conduct a study to evaluate the strength of any *statistical* relationships between credit history and insurance claims experience. In the subcommittee's opinion, any finding of *causality* in any context or field of study is a statement of a *theory* or *conjecture* based on the observation that there is a strong statistical relationship between the "cause" and the "effect."

If the NAIC chooses to develop opinions about the relationships that may exist between credit histories and driving record, we recommend that the NAIC consider that both credit history and insurance claims experience may be manifestations of one or more other personal characteristics. For example, the frequency of a person becoming momentarily inattentive might be highly correlated with both credit history and with driving record. Alternatively, perhaps one or more characteristics, such as aggressiveness, the willingness to take risks, or the ability to make quick judgments, are correlated with both credit history and with driving record. As far as we know, no one has identified which relevant personal characteristics might be correlated with both credit history and driving record, but it is not necessary to identify those characteristics to measure their impact. In our opinion, these personal characteristics would be difficult to identify and to directly measure otherwise, insurance companies likely would be using them in their risk classification systems.

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An effective risk classification system is one that effectively differentiates between groups of policyholders who will have different levels of loss experience in the future. Each criterion in the risk classification system should contribute to the ability to differentiate among different levels of future loss experience. The contribution of each criterion can be measured statistically. Although the NAIC did not ask the subcommittee to review the validity of using credit history as a rating tool for personal lines of insurance, the subcommittee's opinion is that credit history can be used to effectively differentiate between groups of policyholders. This opinion is based on review of the Monaghan paper and on our general knowledge of rate filings that have been submitted in many states.

Causality is not a requirement for any element in a risk classification system. For example, drivers with past accidents and driving violations have been shown to have higher rates of accidents in the future, and therefore driving record is a useful and commonly accepted element of risk classification systems for automobile insurance. However, histories of past accidents and violations do not *cause* driver to have more accidents. The rating practice that does exist is based on the fact that, as a group, drivers who have been accident-prone in the past are likely to be accident-prone in the future.

Impact of Credit-Related Insurance Rating for Policyholders without a Credit History

In regard to the protected classes as defined by the NAIC (race, religion, and ethnicity), the subcommittee understands that the NAIC may have a concern that certain groups traditionally avoid the use of credit, and that credit-related insurance rating and underwriting practices might therefore tend to cause affordability and availability problems for these groups because of the lack of credit history. To the extent that the NAIC has this concern, we recommend that the NAIC conduct a survey of insurance companies to determine how insurance rates and underwriting decisions are affected by a lack of credit history. Although some rating plans may

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adversely affect a consumer who does not have credit history, there are a number of rating plans that treat such consumers as “average” or “preferred” for eligibility and rating.

Absence of Conclusions regarding Disproportionate Impact of Insurance Rating based upon Credit-Related Factors

None of the four papers that the subcommittee reviewed contained the necessary information for us to evaluate whether credit-related insurance scoring results in a disproportionate impact for protected classes or for low-income policyholders. The Monaghan paper provides the most detailed analysis of the use of credit history, but the Monaghan paper is based on insurance data and insurance databases do not include information about race, religion, ethnicity, or income.

Only the Virginia study attempted any treatment of this subject. The results of that study included an indication that income and race are not reliable predictors of credit scores, but that study relied on aggregate data by ZIP codes rather than a rigorous analysis that matches the credit history and demographics of individuals.

Designing a Study to Evaluate Whether the Use of Credit History Disproportionately Affects Protected Classes or Low-Income Groups

The Risk Classification Subcommittee looks forward to providing assistance and commentary should the NAIC decide to undertake a study. The subcommittee role, however, will be limited to providing advice and guidance. The subcommittee would not undertake development of the actual study specifications, and it would not perform the analysis of the data.

The subcommittee considers this report to be the first step in providing such assistance, and provides this report with the understanding that there will be opportunities to provide additional assistance and commentary as the NAIC develops its plans.

Defining Study Objectives

We recommend that the NAIC define its objectives for any study that it intends to undertake, so that any

potential study can be designed to meet its objectives as efficiently and effectively as possible. This includes, among other things, the following:

- Defining what is meant by “disproportionate impact”;
- Defining the magnitude that any disproportionate impact would need to reach in order to merit regulatory concern, if any;
- Deciding what further information, if any, would be needed if it is determined that there is a disproportionate impact; and
- Deciding how the protected classes and low-income consumers would be subdivided for analytical purposes.

Following is some discussion of each of these points:

We interpret “disproportionate impact” to mean that a rating tool results in higher or lower rates, on average, for a protected class, controlling for other distributional differences. We would expect that many rating tools would have disproportionate impact, because protected classes (and all other classes) are likely to have different demographics than the general population. For example, if any protected class has a younger average age than the general population, the use of age as a rating variable would have a disproportionate impact on that class (resulting in higher rates, on average). As another example, to the extent that lower-income families are less likely to own expensive cars, charging lower premiums for less expensive cars will have a disproportionate impact on low-income drivers (resulting in lower premiums, on average.)

Disproportionate impact is different from *disparate* impact. Disparate impact is a concept that has been widely discussed in the context of federal civil rights legislation. This is outside of our area of expertise, but we understand, for example, that a hiring practice is said to result in disparate impact if it results in substantial disproportionate impact and there is not a business necessity for the practice. Thus, disparate impact is determined using a two-step process, and the determination of disproportionate impact against members of a protected class is only the first step of that two-step process.

While designing a regulatory study, a primary consideration should be the potential usefulness of its results. This requires that there be some determination, prior to the study, of the magnitude of disproportionate impact that would trigger regulatory concern. The decision regarding the magnitude would then influence the size of the population that would need to be sampled in order to generate statistically significant findings.

In designing a regulatory study, it will be important to decide what further information, if any, would be needed if it is determined that there is a disproportionate impact of a magnitude sufficient to trigger regulatory concern. For example, a study that only estimates *disproportionate* impact will not necessarily tell whether there is *disparate* impact and it likely will not provide sufficient information for regulators to determine whether the disproportionate impact is in line with a disproportionate level of insurance losses for

the affected protected class. If the NAIC found a material disproportionate impact on a given protected class, and wanted to find out if that disproportionate impact was consistent with insurance loss experience for that class, then the study would need to include the collection of insurance experience in addition to the credit and demographic information. When designing a regulatory study, it will be important to decide what categories of protected classes and low-income groups will be examined for disproportionate impact. The NAIC should identify which racial categories it will evaluate. The 2000 Census form identified the following five races:

- White;
- Black;
- American Indian or Alaska Native;
- Asian; and
- Pacific Islander;

(The Census form also permitted the write-in of other races.)

The NAIC should identify which religions it will evaluate. Depending on how religious groups are defined, there could be many hundreds of different religions. For example, each “major” religion consists of many sects or denominations. The NAIC will need to define exactly which groups are important to the study. The NAIC should identify which ethnic backgrounds it will evaluate. Depending on how ethnicity is defined, there could be dozens or hundreds of ethnicities. The NAIC will need to define exactly which ethnic groups are important to the study.

The NAIC should define the low-income group(s) that it will evaluate. For example, the NAIC might decide to use the “poverty thresholds” used by the U.S. Census Bureau, which are defined based on the number of people in the family unit and the number of related children under the age of 18. Alternatively, the NAIC might decide to use a simpler measure, such as total family income regardless of family size and number of children.

Other Considerations

Depending on the objectives and design of the study, the NAIC may need to conduct the study for a *very substantial* population. Consider an example. Suppose that a protected class constitutes ten percent of an entire population. It follows that an unbiased sample of 5,000 would be expected to have about 500 members of the protected class. Depending on the standards of materiality and the degree of confidence selected, this might be an adequate sampling to determine whether or not an insurance rating system has a disproportionate impact on the protected class. But a sampling of the same size would be woefully inadequate to determine whether the degree of disproportionate impact was in line with loss experience, even if several years of insurance experience were available.

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The data for this study would need to meet several standards, one that is objective and one that is subjective. Clearly, there would need to be a sufficiently large body of data so that indications of *material* disproportionate impact would be statistically reliable. If a disproportionate impact of five percent was considered to be material, then a larger body of data would be necessary to identify that difference than if a materiality standard of 25 percent was selected. The more difficult standard with which to comply, because it would be somewhat subjective would be keeping data unbiased. With a perfectly unbiased sample, statistical variation would be the only reason to expect that the results obtained from a sample population would be different from that of the entire population. Unfortunately, it may be very difficult and expensive to obtain data that will be sufficiently unbiased to satisfy decision-makers.

At this time, the Risk Classification Subcommittee is unaware of any proprietary or open public databases that contain the necessary protected class data to ascertain the existence of disproportionate impact. Unless suitable databases can be found and utilized, an NAIC study to estimate disproportionate impact would need to develop its own data.

Depending on the objectives of the study, and the availability of proprietary or open public databases, the NAIC may decide to conduct a study based on aggregated consumer data rather than on data that is at the level of individual consumers. In this case, we would recommend that the NAIC consider reviewing consumer data at the level of "ZIP + 4" rather than by ZIP code. The ZIP + 4 level of detail is more refined than the ZIP code level of detail, and therefore is likely to be more homogeneous in terms of its population.

In addition to costs, the major hurdle would be to obtain the necessary credit and protected class information in a way that the study will not draw erroneous conclusions based on a biased sampling. Any procedure that relies upon individual consumers to reveal or release credit or protected class information is likely to encounter a lack of cooperation. The question that would then arise is whether or not the conclusions drawn from data on those consumers who did cooperate could be extended to the entire population.

Recommended Best Practices for Reviewing Rating Plans Based on Credit History

The subcommittee recommends that regulators should review rating plans that use elements of credit history using the same basic standards that apply for the review of any other rating factor or rating plan. The differences that regulators are likely to encounter are that:

- It appears more likely that insurance companies will request “trade secret” status for their models. The subcommittee recommends that such requests should be treated in accordance with the regulator’s standard procedures for dealing with requests for confidentiality for rate filings.
- The justification underlying the initial filing of an insurance rating plan using multiple elements of credit history is likely to be more complex than most rate filings that regulators will receive.

Consistent with practices with other newly filed rating plans, the regulator should expect a complete description of the rating model and how the model was developed, and justification for the selected criteria used in the model and for the rating factors that result from the model. If this is not provided with the original filing of the model, then the regulator wishing to analyze the model should ask for the explanations. As with other rate filings, small companies may sometimes submit filings based on rating plans of competitors, justifying their plan to use credit history by citing the plans used by one or more larger insurance companies. Regulators should treat such filings in accordance with their customary procedures for dealing with filings from small insurers with limited data.

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There are three main areas of additional concern when reviewing a rate filing containing a credit scoring model that regulators may wish to consider. The first concern is the potential complexity of the model itself and the relationships between the factors used in the model and the other factors used in the pricing process. The second concern is the insurer's use of the model results and whether the proposed model rating values are reasonably related to loss experience. The third concern is how the introduction of a credit scoring model or proposed changes to the model values affect the values of the other rating factors.

The first concern is the complexity of the model and the relationships between the various factors used in the pricing process. A filing of a rating model using credit history should contain the model or any changes to the previously filed model. While the actual model formulae vary widely by insurer and may be relatively simple or quite complex, a common feature of rating models using credit history is that they base their results on a number of different factors included in a risk's credit history. The use of multiple model factors necessitates not only a review of the individual factors and their influence on the model's results but also a review of the factors in combination. The reason for this is that some of the factors contained in these models may be interrelated.

An analysis of a single model factor will show whether that factor has relevance and will provide a weight to the factor. A model that uses the weights from individual factor analyses could yield too much influence on the premium structure, if the factors are interrelated. The weight given a factor is dependent on the relationship of this factor to the other factors in the model. The insurer should provide sufficient documentation as to the methods used to adjust the model when there are interrelationships among model factors.

The second concern is the reasonableness of the rating values associated with the credit scoring formula and the range of model results associated with each rating value. The proposed rating

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values should match or not exceed the indications from loss experience, with reasonable allowances for smoothing of results. The insurer should also provide sufficient loss experience to determine the reasonableness of the model ranges associated with each rating value and the relationship between the rating values and loss experience.

The third concern relates to the possible correlation of rating models using credit history with other rating factors used by the insurer. Such correlations could exist with any rating factor. For example, there is an indicated correlation with age, as credit tends to improve with age. As a result, some insurers only apply credit based models to persons over a specific age or adjust the model weight depending on age. These are only two of the possible solutions for handling correlation between different rating variables. There is also the possibility that these models may have differing effects upon policyholders in different rating territories. It may be useful to obtain the average impact of the proposed model on individual driver classifications and by territory. The regulator may wish to request statistical information on the correlations between the credit based model and the insurer's other rating variables, and how all the variables have been adjusted to handle correlations between rating variables, whether credit based or not. When a rating model using credit history is implemented, it should be done in such a fashion that each current rating classification has been considered in relation to the model.

In summary, the Risk Classification Subcommittee does not believe that models using credit history require the application of different regulatory standards than other rating plans using other traditional policyholder characteristics. The main differences in the treatment of such filings will probably arise from the necessity to examine interrelationships among so many rating variables and the complications that these analyses will entail.

Risk Classification Subcommittee

The Risk Classification Subcommittee of the American Academy of Actuaries was re-established in May 2002 for the purpose of assisting the NAIC's Credit Scoring Working Group.

The subcommittee consists of the following volunteers and staff:

Chairman: Walter Wright, MMC Enterprise Risk Consulting, Inc.

Members: Leo Bakel, State Farm Insurance Companies
James Monaghan, MetLife Auto and Home
Chet Szczepanski, Pennsylvania Insurance Department
Rae Taylor, Oregon Insurance Division
Alan Wickman, Nebraska Department of Insurance
Pat Woods, Insurance Services Office, Inc.

Affiliate Member:

George Dieter, Travelers Insurance Company

American Academy of Actuaries Staff:

Greg Vass, Senior Casualty Policy Analyst

The subcommittee appreciates the opportunity to provide assistance to the Credit Scoring Working Group.