Disparate Impact and Unfairly Discriminatory Insurance Rates

Michael J. Miller, FCAS, MAAA

Abstract.

Historic actuarial literature, general insurance literature, and legislative histories reveal "unfairly discriminatory rates" to be a cost-based concept. A rate structure is unfairly discriminatory if the insurance premium differences between insureds do not reasonably correspond to differences in expected insurance costs. More recently a new rate concept has arisen in some court cases which is referred to as "disparate impact" (or "adverse impact"). Disparate impact has nothing to do with underlying insurance costs and is solely based on the disproportionate impact of the insurance rate structure on the insurance premiums paid by protected minority classes defined by race, color, religion, sex, or national origin. It would likely be a rare instance where the rate standard of unfairly discriminatory and the concept of disparate impact could be applied simultaneously to a risk classification plan without conflict. It is the author's opinion that if the standard of disparate impact eventually prevails over the historical rate standard of unfairly discriminatory, then accurate risk assessment will be destroyed, adverse selection will be widespread in the insurance marketplace, and coverage availability will suffer.

Keywords. Risk classification plans; risk assessment; credit scoring; insurance law; rate regulation; adverse selection; disparate impact; adverse impact.

1. INTRODUCTION

In today's society, the terms discrimination and disparate impact connote unfairness. Without any historical context as background, it would not be surprising for the average person to mistakenly conclude that the term unfairly discriminatory is redundant, and that the term disparate impact is just another form of unfair rate discrimination. However, a review of insurance literature, legislative histories, and court cases reveal that the terms disparate impact and unfair rate discrimination are fundamentally different. In insurance ratemaking there has always existed a form of rate discrimination which is considered to be fair if the rates are based on underlying insurance costs. On the other hand, disparate impact is defined without any reference to underlying insurance costs.

The origins of the common rate standards applied by actuaries (i.e., reasonable, adequate, not excessive, and not unfairly discriminatory) are discussed in this paper, with special emphasis on the rate standard of unfairly discriminatory. The insurance literature and legislative histories show the four common rate standards to have meanings based entirely on the underlying anticipated insurance costs. It is precisely because these rate standards are cost-based that actuaries have adopted these standards as terms of art, as set forth in Principle 4 of the Casualty

Actuarial Society's Statement of Principles Regarding Property and Casualty Insurance Ratemaking (i.e., CAS Statement of Ratemaking Principles).

More recently, some courts have considered the application of a new standard of disparate impact (or adverse impact) to insurance rate structures. Thus far no court has actually applied the disparate impact standard to insurance rates, but it is only a matter of time before some court does so. The standard of disparate impact has its origins in federal civil rights laws and has been applied by the courts in a range of issues including employment, educational testing, housing, and age discrimination. Unlike unfairly discriminatory rates, disparate impact is not a cost-based concept. If applied to insurance, a risk/rate factor will potentially be said to have a disparate impact if it more adversely impacts a protected minority class than it does the majority class, regardless of its relationship to underlying costs.

It is reasonable to assume a priori that no protected minority class (i.e., race, religion, sex, etc.) will be uniformly distributed throughout any given insurance risk classification plan. This assumption implies that all risk factors used to measure and assess risk are potentially in violation of a disparate impact rate standard, even though each risk factor accurately reflects expected losses and expenses.

If a risk classification plan were changed to eliminate one or more risk factors found to have a disparate impact, the resulting rates would likely be unfairly discriminatory because the rate differences would no longer be based on the underlying insurance costs. Therein lies the inevitable and irreconcilable conflict between the two standards.

This paper concludes with a brief discussion of the potential role of an actuary with the various issues related to disparate impact. Even though disparate impact is not cost-based, and therefore not an actuarial term of art, actuaries do have expertise in measuring the statistical significance of any differences in rate impact between the majority class and a protected minority class. Actuaries could also provide expertise in defining the data needed to measure disparate impact and in establishing the business necessity of any risk factor in question.

2. THE DAWNING OF U.S. RATE REGULATION AND RATE STANDARDS

The origin of property/casualty insurance rate regulation in the U.S. is rooted primarily in the history of fire insurance. It was solvency concerns and destructive price competition in the fire insurance business in the 1800's that spurred the need for cost-based actuarial ratemaking procedures and the need for rate regulation by the states.

In the early to mid-1800's local boards (i.e., voluntary associations of insurers) were organized to provide a means of sharing loss data and to enforce uniform rates among the insurers. Uniform rates were desired so that rates were adequate to protect against insolvencies and were not unfairly discriminatory. The primary concern with unfairly discriminatory rates, often stated at the time, was that rich and powerful insureds could unfairly negotiate lower rates than were being charged to less influential insureds, even though their degree of risk and underlying insurance costs did not warrant a lower rate.

In 1866 a national association of insurers, the National Board of Fire Underwriters (i.e., NBFU), was formed to gather industrywide data and to develop a uniform rate schedule. The NBFU decreased the need for local boards. During the ensuing profitable years the insurers regularly violated their NBFU membership agreements by engaging in destructive rate-cutting. On the verge of disbanding just prior to the 1871 Chicago fire, the insurer insolvencies which followed the Chicago fire gave new life to the need for rate discipline and new life to the NBFU. But profitability soon returned to fire insurers and destructive rate-cutting returned to the market. Rampant rate-cutting caused the NBFU to finally disband in 1887, thereby shifting "control" of fire insurance rates back to local boards and associations.

Federal legislation in the 1880's, which outlawed combinations of insurers in restraint of trade, led about half the states to adopt anti-compact laws between 1885 and 1907. The anti-compact laws sharply reduced the ability of local boards to maintain uniform, adequate, and fairly discriminatory rates. The pressing need for insurers to associate so as to create a combined, credible fire insurance database and the existing lack of discipline in fire insurance rating practices in the late 1800's led to many proposals for state regulation of rates.

3. UNFAIRLY DISCRIMINATORY RATES

3.1 Early Rate Regulatory Laws

The first modern-style rate regulation statute was enacted in Kansas in 1909. The Kansas law required fire insurance rates to be filed with the Insurance Commissioner and required the rates to be reasonable, not excessive, adequate to the safety and soundness of the insurer, and not unjustly discriminatory. Unjust discrimination was defined as charging different rates to persons with "risks of a like kind and hazard".

Soon after enactment of the Kansas law, although largely as the result of the insolvencies and the subsequent sharp fire insurance rate increases ensuing from the fires following the great San Francisco Earthquake of 1906, the New York legislature appointed the Merritt Committee and launched an investigation of fire insurance rates. The Merritt Committee Report led to New

York's first rate regulatory law in 1911. This law permitted insurers to gather data and act in concert to set rates through rate bureaus. The New York law also required fire insurance rates to be filed with the Superintendent of Insurance and prohibited unfairly discriminatory rates. The law and the Merritt Committee Report made it clear that rates were considered to be unfairly discriminatory if different rates were charged to risks in the same class or of essentially the same hazard. Class rate differentials based on differences in risk and loss experience were expressly permitted by the New York legislation.

New York, working through the National Convention of Insurance Commissioners (i.e., NCIC), offered its new fire insurance rate law as a prototype for other states. Many states (e.g., New Jersey in 1913) did adopt similar rate regulatory laws which permitted collusive rate setting through rate bureaus and prohibited unfairly discriminatory rates. Consistently, the clear purposes of these early laws were to permit collusion in regard to data gathering and rate setting, and to ensure that rates were established commensurate with the degree of risk and hazard being insured. In a speech before the NCIC in 1915, the New Jersey Insurance Commissioner spoke about the need to base insurance rates on the degree of risk being insured and the unfair discrimination that arose when "some people were getting insurance for less than it was worth and others were paying for it."

3.2 McCarran-Ferguson and Modern Rate Regulation

The enactment of Public Law No. 15 (i.e., McCarran-Ferguson) on March 9, 1945 reaffirmed the right of the states to regulate insurance by providing an antitrust exemption for insurance to the extent that insurance was regulated by state laws. McCarran-Ferguson spurred a new and modern round of state rate regulatory laws throughout the United States. As a result of McCarran-Ferguson, the National Association of Insurance Commissioners (i.e., NAIC) immediately turned its attention to drafting model rate regulatory laws that could be considered for adoption by the majority of state legislatures which were scheduled to begin to meet next in 1947. The 1945 NAIC proceedings indicate that the model laws and the rate standards were based largely on existing state rate regulatory statutes, as witnessed by the following quote from the May 12, 1945 Report of the Subcommittee on Federal Legislation:

> "On the subject of rate regulation the Committee felt that there were well-defined patterns available based upon the actual experience of a number of states which could be used as a foundation for the drafting of rate regulatory statutes at this time. This fact was recognized by certain segments of the insurance industry which prepared so-called model rating bills based largely upon existing statutes

> and which were used as guides for the enactment of rate regulatory laws recently in several states."

The NAIC's model fire/marine and casualty/surety rate regulatory bills of 1946 utilized the rate standards of not excessive, inadequate or unfairly discriminatory and required that rates be based on consideration of past and prospective loss and expense experience. These model bills specifically allowed for the grouping of risks by classifications for the establishment of rates. Classification rates could be modified for individual risks if, and only if, the modification was based on "variations in hazards or expense provisions, or both."

The NAIC model bills were a pervasive influence on individual state legislatures. It is not at all surprising that the rate regulatory laws throughout the U.S. today contain similar, if not the same, language as the 1946 NAIC model bills. As an example, the influence of the 1946 NAIC model bills on individual state rate regulatory laws can be found in the California McBride-Grunsky Act of 1947 (S.B.1572). This California statute prohibited rates that were unfairly discriminatory and specifically allowed for differences in rates between risk classifications, if the rate differences were based on the differences in the underlying hazard or expenses.

A new rate regulatory statute was established in California in 1988 with the passage of Proposition 103. Proposition 103 reestablished the unfairly discriminatory rate standard, as well as placed certain restrictions on some rate factors used in rating personal auto insurance. Subsequent to the passage of Proposition 103 new rate regulations were adopted and some lower courts addressed the definition of unfairly discriminatory rates in California. In this author's opinion thus far there have been no changes in California to the traditional concept that rates should be based on expected costs and not be arbitrary.

4. DISPARATE IMPACT ON INSURANCE RATES

4.1 History

The concept of disparate impact[1] has its roots in certain federal civil rights laws, including the Civil Rights Acts of 1866, 1964, and 1991 and the Fair Housing Act (42 U.S.C. Sec. 3604) (i.e., FHA). Broadly speaking, this category of federal laws prohibits discrimination based on race,

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[1] Note: As in this paper, the terms disparate impact and adverse impact are generally used interchangeably to mean that a protected minority class is being adversely and disproportionately impacted as compared to the impact on the majority class. Disparate impact and adverse impact are both distinguished from disparate treatment, which involves intent to discriminate in a way that is prohibited by federal civil rights law.
In this paper the terms disparate impact and adverse impact are used with the recognition that the impact may occur in neutral processes without the specific intent to violate any civil rights prohibitions. Disparate treatment, based on the intent to violate discrimination prohibitions, is not related to actuarial considerations, is a mutually exclusive theory from disparate impact, and is not addressed in this paper.

color, religion, sex, or national origin. The seminal disparate impact case was decided by the U.S. Supreme Court in Griggs v. Duke Power 401 U.S. 424, 430-32; 1971. The Civil Rights Act of 1991 codified the disparate impact findings in Griggs.[2]

Disparate impact has been defined by various courts as an unintentional discrimination against the protected minority class and its existence is not necessarily illegal. If a plaintiff is able to establish that a specific practice leads to a significantly higher adverse impact on the protected minority class than on the majority class, the defendant then has the burden and opportunity to prove that the practice in question has "legitimate business reasons" or "business necessity" (see Watson v. Forth Worth Bank & Trust, 487 U.S. 977, 978; 1988). Even if the defendant is successful in showing the practice in question is of a business necessity, the plaintiff still has the opportunity to show that other practices would serve the defendant's business purposes without disparate impact against the protected minority class (see Albermarle Paper Co. v. Moody, 422 U.S. 405, 425; 1975).

In summary, past court decisions seem to suggest that a business practice with disparate impact on a protected minority class will be considered illegal by the courts if:

a. there is a significantly higher adverse impact on a protected minority class than on the majority class, and

b. either the practice in question cannot be shown to have a legitimate business necessity, or an alternate practice is shown to achieve the business purpose without the disproportionate adverse impact on the protected minority class.

4.2 Measurement of Significance

The Uniform Guidelines on Employee Selection Procedures (adopted in 1978 by the EEOC, U.S. Civil Service Commission, Department of Labor, and the Department of Justice) provided the so-called "4/5's Rule" as a guideline for employment selection practices. This guideline allows for some disproportionate adverse impact against the protected minority class as long as the impact is not considered to be significant by the court. The adverse impact is considered to be significant only when the "4/5's Rule" is failed. For example, if 60% of the job applicants in the majority class are hired and only 50% of the job applicants in the minority class are hired, the difference in impact is considered not significant and not discriminatory. This is because the hiring rate of the minority class is more than 80% of that of the majority class.

[2] Employment Discrimination Law, American Bar Association, Barbara Lindemann and Paul Grossman, Volume I; Chapter 3, 2007.

The "4/5's Rule" to determine significance is not the only test of significance that has been used by the courts. In some cases, statistical tests of significance or a showing of a disparity of two or more standard deviations have also been applied to determine if the adverse impact is significant enough to be a problem. To guard against a relatively small difference being considered statistically significant because of a large sample size, some courts have required that a statistically significant disparity also have a practical significance.

Although anything is possible in terms of future lawsuits, it is the author's opinion that the "4/5's Rule" may not be accepted as a test of significance for insurance ratemaking. It is more likely that the determination of significance of any disparate impact of insurance rates will be based on statistical tests of significance.

4.3 Application to Insurance Practices

There is a strong legal argument that federal civil rights laws, including the FHA, should not be applied to the pricing and underwriting of insurance because of the McCarran-Ferguson exemption. Thus far the courts have rejected this McCarran-Ferguson argument. However, most of the insurance cases in which the courts have rejected the McCarran-Ferguson defense have involved claims of either fraud or intentional discrimination (i.e., disparate treatment).

One such "disparate treatment" case was NAACP v. American Family Mutual Insurance Company (978 F.2d 287, Seventh Circuit, 1992). The complaint in the American Family case involved an alleged violation of the FHA due to charging higher rates for residential property insurance in racial minority neighborhoods. The Court observed that there was an important distinction between disparate treatment and disparate impact because the nature of insurance inherently requires risk classification and discrimination by degree of risk. As the Court said in the American Family case, "risk discrimination is not race discrimination."

In a more recent insurance case (DeHoyos, et al. v. Allstate, et al., 345 F.3d 290, Fifth Circuit, 2003), it was charged that Allstate's residential property insurance rates had a racially disparate impact because of the use of credit-based insurance scores in its rate structure. This was a true disparate impact case, rather than a disparate treatment case, because intent to racially discriminate was not at issue. The Fifth Circuit ruled that McCarran-Ferguson did not preempt the application of the FHA in this case. Allstate appealed the preemption decision to the U.S. Supreme Court, which refused to take the case. After the Supreme Court declined to review the preemption decision of the Fifth Circuit, Allstate settled the case. Even though the Court never had the opportunity to address the issues of disparate impact (i.e., the existence and significance of the difference, the business purpose, or the potential substitutes for credit data) in the Allstate case, it is only a matter of time before some court does.

5. DEFINITIONS

5.1 Unfairly Discriminatory

As previously discussed, the definition of unfairly discriminatory insurance rates has historically and consistently been related to the underlying costs of providing insurance. Prior to the first rate regulatory law in Kansas, insurance literature consistently refers to the unfairness of charging different rates to risks with similar risks of loss and similar hazards. The literature surrounding the adoption of the first rate regulatory laws in Kansas, New York, New Jersey and the 1946 NAIC model rate regulatory bills are consistent on this point.

Professor C. Arthur Williams, Jr.[3] has put forward what is probably the most commonly used, and the most succinct, definition of unfairly discriminatory insurance rates as follows:

> "An insurance rate structure will be considered to be unfairly discriminatory. . . ., if allowing for practical limitations, there are premium differences that do not correspond to expected losses and average expenses or if there are expected average cost differences that are not reflected in premium differences"

5.2 Actuarial Term of Art

It is precisely because the concept of unfairly discriminatory insurance rates has historically been a cost-based concept, that actuaries adopted that rate standard as a term of art. Although this term of art was embodied in much of the early actuarial literature, it was not until 1988 that the CAS Statement of Ratemaking Principles was formally adopted, which declared in Principle 4:

> "A rate is reasonable and not excessive, inadequate, or unfairly discriminatory if it is an actuarially sound estimate of the expected value of all future costs associated with an individual risk transfer."

5.3 Disparate Impact

Court cases reveal that the term disparate impact is not a cost-based concept and, therefore, it is not currently considered to be an actuarial term of art. Disparate impact is strictly a standard based on a significantly disproportionate and adverse impact on a protected minority class defined by race, color, religion, sex, or national origin. In an insurance context disparate impact has nothing to do with the underlying costs of providing insurance.

5.4 Conflict in Definitions

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[3] *Insurance, Government, and Social Policy*, The S.S. Huebner Foundation for Insurance Education, C. Arthur Williams, Jr., Chapter 11, Price Discrimination in Property and Liability Insurance, 209-242.

It is likely that the rate standard of unfairly discriminatory will be in direct conflict with the application of a disparate impact standard to insurance rates. This conflict will potentially exist for nearly every risk factor used to develop property/casualty insurance rates because protected classes, most if not all of the time, will not be evenly distributed throughout the various risk classifications. If a court or legislature were to order that all disparate impacts be eliminated from insurance premiums, it is likely that accurate risk assessment would be destroyed, resulting in unfairly discriminatory rates. Paraphrasing a 1915 NAIC speech by the New Jersey Insurance Commissioner, unfairly discriminatory rates mean that some people would pay less than the insurance was worth, at the expense of other people who would be required to pay more than the insurance is worth in order to subsidize the under-payers. It is possible that the only rate structure which could survive a strict disparate impact standard is "one-rate-for-all." If such a scenario materializes, adverse selection would be rampant in the insurance market and coverage availability would suffer.

6. ROLE OF THE ACTUARY

6.1 Determination of Unfair Discrimination

The role of the actuary in determining underlying insurance costs and verifying that the rate structure is not unfairly discriminatory is well-established and uniquely actuarial in nature. The costs which an actuary considers in a review of any rate structure are prospective losses, prospective expenses, and an appropriate provision for risk commensurate with the cost of capital necessary to support the insurance mechanism.

6.2 Determination of Disparate Impact

The role of the actuary with disparate impact issues has not yet been fully established. Certainly actuaries are not trained to opine on social policies or to determine which minority classes deserve the protection of the law. Society's definition of overall fairness needs to be left to the legislatures and courts.

However, actuaries do possess the unique expertise to measure the impact on insurance rates of any risk factor and to determine the degree and statistical significance of any apparent disparate impact on any protected minority group defined by law. If a court were to find that a particular risk factor had a disparate impact on the insurance premiums of a protected minority group and the disparate impact was statistically significant enough to be of concern to the court, actuaries would be uniquely qualified to opine on the predictive power and business necessity of the risk factor in question, as well as opine on any risk factors that might replace the risk factor in question.

6.2.1 An example

When disparate impact arises in the context of insurance rates, it will likely be an issue with personal auto or residential dwelling insurance. The risk factor in question could be territory rate factors, because racial groups likely differ in their geographical distributions. Or in the case of auto insurance, the risk factor in question could be age of driver, gender of driver, credit-based insurance scores, or etc. In the case of homeowners insurance, rates based on the age of the home have already been challenged as having a disparate impact. Since the distribution across the various rate classes of racial groups is likely to vary somewhat for every risk factor, there is a potential for "disparate impact" with every risk factor.

For purposes of this example, assume the risk factor in question is credit-based insurance scores as applied to personal auto insurance. In its July 2007 report in the U.S. Congress, the Federal Trade Commission (i.e., "FTC Study") found that credit-based insurance scores "are effective predictors of risk" for auto insurance. The FTC also found that credit-based insurance scores "are distributed differently among racial and ethnic groups, and this difference is likely to have an effect on the insurance premiums that these groups pay, on average". While the FTC did not attempt to actually measure the effect on auto insurance premiums, or opine on the statistical significance of any premium impact, the mere suggestion of a "likely" unequal impact on average premiums raises the spectre of disparate impact for this risk factor.

The following sections discuss the role of an actuary in a hypothetical lawsuit where the charge is that credit-based insurance scores have a disparate impact on the auto insurance premiums for a protected racial minority.

6.2.2 Data to determine disparate impact

However a court or legislature might define disparate impact as applied to insurance practices, it is highly likely that the determination of its existence will involve sophisticated analyses of data. Unlike employment/hiring cases, it will be difficult, if not impossible, to accurately apply any racial disparate impact definition to insurance rates in an objective, statistical way because the racial data needed are simply not available.

The FTC Study was based on racial information for each policyholder obtained from the Social Security Administration. Due to limitations in this data prior to 1981, the FTC also relied on a Hispanic surname match and Census tract data to identify some Hispanics, Asians, and Native Americans. The reliance on a surname match and Census tract data to identify Hispanics, Asians, and Native Americans for policyholder records prior to 1981 raises concerns about the accuracy of those racial identifications. Plaintiffs in disparate impact cases will likely have access to databases that are even less perfect than the database available to the FTC.

In our hypothetical lawsuit, there will be no racial information in the insurer's policyholder records that can be produced through the discovery process. Neither the plaintiff nor the defendant will have access to the Social Security Administration's database, as did the FTC. In order to carry the burden of showing disparate impact on any racial group, the plaintiff will necessarily be restricted to a conjecture and inference of each policyholder's race based on surname matches, Census tract data, or other potentially inaccurate indicia of race.

Since actuaries routinely use data to analyze insurance rates, actuaries will be able to offer this hypothetical court a great deal of expertise with regard to the reliability and credibility of any demographic data used to measure the extent of disparate impact on insurance rates.

6.2.3 Statistical significance of disparate impact

Assume the plaintiff is able to convince the court that its data are of sufficient accuracy and that some adverse disparate impact actually exists on the average premiums paid by a protected minority group. The next question before this hypothetical court is whether the disparate impact is significant enough to be of concern.

Since historically the "4/5's Rule" relied on by some courts in employment/hiring cases has been applied to binary decisions, (i.e., the decision to hire or not hire), it is not obvious how it would be applied to insurance rates. Perhaps as long as the impact on the average insurance premiums for a protected minority group is no greater than 20% of the impact on the premiums for the majority, then the disparate impact is deemed acceptable. However, this is only one of many possible tests that might be applied in disparate impact litigation. It is likely the plaintiff in this hypothetical lawsuit will argue for a narrower range of acceptability.

Actuaries are well-qualified to opine on the statistical and practical significance of any disparate impact found by the court, whether the degree of significance is based on some variation of the "4/5's Rule" or on the application of other common statistical tests of significance.

6.2.4 Business necessity and potential replacements

If our hypothetical court finds that credit-based insurance scores disparately, and significantly, impact the insurance premiums of a protected minority group, and if this hypothetical case then proceeds in the same way that similar employment/hiring cases have proceeded, the burden would then shift to the defendant insurer to show the business necessity of credit-based insurance scores.

Actuaries are uniquely qualified to conduct a multi-variate analysis of the defendant insurer's loss data to statistically prove the degree to which credit-based insurance scores add value and precision to the risk assessment process. The FTC's finding that credit-based insurance scores are effective predictors of auto insurance risk would likely be corroborating evidence.

It is important to note that the actuarial analysis supporting the business necessity of credit-based insurance scores (i.e., predictive power) will rely on obtainable, objective claim loss data, just as did the FTC Study. The analysis of predictive power does not rely on any inaccurate racial data, thereby avoiding the data problems associated with determining the existence of a disparate impact on any protected minority group.

Finally, an actuary would be uniquely qualified to opine on the effectiveness of any proposed alternative rate factors; how the elimination of the risk factor in question would create a rate structure that is unfairly discriminatory in violation of the state's rate regulatory standards; and be able to explain how the resulting adverse selection would lead to coverage availability problems in the market.

7. CONCLUSION

The concept of unfairly discriminatory rates has traditionally been cost-based, meaning that rates reflect the underlying risk and hazard. The concept of disparate impact has no relationship to the underlying insurance costs and refers solely to the adverse, significant disproportionate impact of one or more rate factors on a protected minority class.

The standards of unfair discrimination and disparate impact will potentially be in conflict because of the likelihood that protected minority classes will not be proportionately distributed throughout the various risk classifications. If the standard of disparate impact prevails over the standard of unfairly discriminatory rates, important risk factors will likely be banned from insurance rating plans. The elimination of even one proven risk factor will result in a rate structure that is unfairly discriminatory. Accurate risk assessment will be destroyed; adverse selection will be rampant; and coverage availability problems will likely arise.

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Biography of the Author

Michael J. Miller is a consulting actuary with EPIC Consulting, LLC. He is a FCAS and MAAA and has primarily focused his practice on ratemaking related issues. He has twice been elected to the CAS Board of Directors, has served the CAS as its Vice President–Research, has chaired the Risk Classification Committee and was the first chair of the Ratemaking Committee.