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The Evolution of Credit Scoring

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[Editor's note: The following article is based on material presented by Rick Dorman, owner of Dorman Consulting, at the S.I.R. Workshops held in St. Louis, Missouri. This article provides an excellent framework within which both the novice and the experienced insurance professional can review the industry's use of credit scoring.]

Credit scoring is the hottest topic today in personal lines insurance. Since its first use in the late 1980's it has spread rapidly across the industry and is now used by most of the major insurers as a key determinant of risk quality.

While the use of credit scoring is a new approach, it is simply the latest in a long list of rating variables. Rating variables are risk factors that predict the potential for variations in losses. The first rating variable for insurance

came from a property insurance underwriter who figured out that frame houses fall down quicker and burn faster than brick houses. The first company that used this as a rating variable was probably a major success in its time. They probably overwhelmed their competition by charging less for brick houses and more for frames houses, creating adverse selection in the rest of the industry. The type of construction is simply a rating variable. Virtually every insurance product today uses some sort of rating variable for pricing and/or underwriting. Common examples include the age of insured, type of construction, location of risk, value of risk, type of individual or business, and size of the risk. Credit scoring is simply another in this long series of potential rating variables.

What is a rating variable? How is a rating variable defined? A rating

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variable is simply anything about the risk that based on the potential answer predicts differences in loss behavior. One of the most critical items to understand is that the question must be asked about the risk when the policy is written. The information must be obtained at the time of inception because of a very simple mathematical requirement: it becomes the denominator of the key pricing formulas. The denominator is the number of risks that could have had the loss event. The number of risks that actually had the loss can always be counted; that is the numerator. Effectively and properly counting this denominator, however, has always been a problem with using rating variables.

This is best understood with an example. Everyone involved in auto insurance understands that people who use cell phones are more likely to have an accident. The item that no underwriter can determine, however, is by how much. In other words, how much should we surcharge drivers who use cell phones. This is a perfect

example of the denominator issue because what is not known is how many people are actually using cell phones. An insurer has no ability to stand there and count people driving down the street and measure what the percentage of cell phone usage is at any moment. For that reason insurers cannot quantify the results.

In order to use rating variables an underwriter must have two pieces of information. It is not sufficient to simply know that risk *A* is better than risk *B*; he must also be able to quantify by how much *A* is better than *B*. While a good underwriter should usually be able to identify that one type of risk is better than another, if he tries to actually establish price differences based on judgment he will likely come up with the wrong answer. The ability to price a product using any rating variable requires the ability to have the denominator and quantify the differences in underlying loss costs. Whether pricing is done through credits, debits, surcharges, discounts, rating relativities, or by simply establishing individual prices,

the underwriter needs that denominator.

In order for a rating variable to be properly used the insurer must be aware of a number of requirements and limitations regarding data.

- *First*, the information must be obtainable, as in the preceding example of knowing how many people are actually using cell phones or how often they are using cell phones.
- *Second*, the information must be obtainable in a cost-efficient manner. For example, a company cannot spend \$300 to underwrite a \$100 policy.
- *Third*, regulators and customers, including agents, must understand the variable. If they feel the variable does not make sense to them or they do not understand it, they may simply not use it or not use the company's product.
- *Fourth*, the variable must comply with laws and regulations. The ability to use credit scoring on a state-by-state basis is very different at this point. There are

some states that say insurers cannot use a specific rating variable. For example, auto insurance companies in Montana cannot use the sex of the driver to rate a policy. That is not a problem for insurance companies providing nobody uses the rating variable. The problems arise when some companies use a variable and others do not. This is the situation that will result in adverse selection for those not making use of a proper variable.

- *Fifth*, the company must be able to obtain the information accurately and honestly in order to use the rating variable. For example, many companies still use the number of miles a person drives to work as an automobile rating variable. It is amazing that this has continued to be used for rating since it has been the most lied-to question in insurance. While there are now innovations through mapping software that allow this information to be obtained if the insured's home and work addresses are known, companies

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have blindly used this variable for many decades without an ability to verify the answer.

The reason to use rating variables, whether it is credit scoring or going all the way back to frame and brick, is very simple. They provide the opportunity to get all risks to have a similar, or ideally the same, loss ratio. Getting the same performance would qualify the researcher as a magician who could retire immediately, so similar performance is really the goal. This goal can easily be thought of as a "dart board program". Imagine being able to see all of the rates for a program at one time, such as in a rate manual. If a dart were to be thrown at the rate manual, regardless of which specific box in the chart was hit, the price in the box is designed to yield the same loss ratio. Whether a program has ten different rates, a thousand rates or even a million segments, the goal is to have each price generate the same loss ratio. If this could be achieved, the insurer would have tremendous advantages. It would save money and have a lower

expense ratio because there would be less underwriting. It would eliminate adverse selection. And it would never have to worry about its mix of business changing. All of these things could happen if a company could achieve the perfect rating engine. The industry will never get there, but every time another rating variable is developed, in theory it gets a little bit closer. Credit scoring is the latest in this series of rating variables and appears to be a strong indicator of risk differential.

Today the use of credit scoring is focused on personal lines. A very interesting concept is that it works in both auto and homeowners. Having the same rating variable work in two different lines of insurance is unusual. Credit scoring can, however, have some relevance in commercial lines. This is a little newer, and a little more basic. For some lines of business, such as BOP and some smaller commercial auto risks, the credit score of an individual owner or some credit-related information about the small business could be used.

One of the problems in commercial lines is that insurers have not figured out how to ask the proper questions at policy inception. Most commercial lines insurers use ACORD apps. If the company wants to get more information, it has to use a supplemental application. Agents and customers hate supplemental applications and may not bother to fill out the information. This either causes the company's marketing group to refuse to use it any more, or the underwriters simply allow the applications to be accepted without the information. Either way, the data is missing on many applications and the denominator is not available. If only some of the risks provide the information, it cannot be used because there is no way to know that if the portion of risks with the information are representative of the whole universe. The group completing the information will often be biased towards those risks with no bad information to hide.

As mentioned earlier, a rating variable must be understandable and acceptable to regulators and marketers. Understanding the reasons that credit scoring has a high correlation to loss potential is clearly difficult for many people in the industry. For example, people question how a tornado can know a particular person has bad credit and destroy his home. While obviously the tornado does not select people with low credit, there is a very simple concept as to why credit scoring works. In its simplest terms, credit scoring is a measurement of personal responsibility. A person earns good credit by paying bills on time, following the rules, doing things when he is supposed to do them, not overdoing things, and being careful. People who have a bad credit rating are characterized by the opposite of every one of those traits. Each of these characteristics can be equated to things insurance underwriters worry about. People have more losses when they do not follow the rules, when they do not pay attention and when they are not as careful.

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On the auto insurance side there appears to be a high correlation between credit score and two other rating variables. In the nonstandard auto segment, both driving record and maintaining continuous insurance have been commonly used as risk determinants. There is apparently overlap between the credit score and both driving record and keeping insurance in force since they all are representative of personal responsibility. Insurers must understand this and make certain that no one double counts. If someone has 6 tickets and a 400 credit score, fully charging for both items will be excessive and result in overpricing. The other side may be just as true; the person with a 10-year perfect driving record is likely to have a good credit score as well. One avoids tickets by following the rules and paying attention, the same factors that give him a good credit rating.

While understandable in auto insurance, on the homeowners side it is more difficult for people to grasp,

but personal responsibility is still the same answer. How does being personally responsible make one a better homeowner's risk? He can remember to lock the door so there is less theft, turn off the stove or put out a cigarette to reduce fire risk, pick up the toys around the front steps so a visitor does not fall on the steps, and pay attention to the fact that the house needs repairs. The tornado does not check you're his credit score, but there is still going to be some difference in storm-related losses reflective of credit score. Why? The more responsible person is going to fix his roof shingles, fix the broken door, and make certain that things are tied down or secure from wind loss.

When comparing the use of credit score for the two key personal lines products there is a very interesting difference between auto and homeowners. Credit score appears to be a more important predictor for losses for homeowner than for auto. While some people are surprised by this fact, there is a very simple reason. Insurers have long focused on the

“who” part of the auto risk. The “who” part of the homeowners risk has been ignored. Homeowners’ insurers almost never worry about who they are insuring. In a new development of tract houses, where every house looks exactly the same and every house is worth within \$5,000 of the others, there can be a saint in one house and a sinner in the next house and every insurer in the country will charge them the same rate. Insurers have only worried about when the house was built, how much it cost, what is it made of, and so forth. They never worry about who is living in it. Credit scoring is the first rating variable for homeowners insurance that has ever been looked at the resident. That is why it has been such a major factor on the homeowners side as opposed to the auto side. Although not easy to quantify, the use of credit scoring has a far greater impact on homeowners than auto.

The use of credit scoring is an evolution in the business. While there are still some restrictions on its use as

a rating variable in some states, it is continually gaining acceptance across the country as a valid rating variable or underwriting criteria. As its use has increased, those companies slow to adopt the concept are going to discover they are the victims of adverse selection. Their mix of business will gradually tip more towards risks with lower credit scores as the companies using credit as a rating tool skim the best risks from the market by offering lower prices. Most companies not yet adopting this methodology will likely find they have no choice but to modify their programs to make use of this powerful tool.

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