"The Insurability of Risks"

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Howard Kunreuther and Paul Freeman

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CHAPTER III.2

The Insurability of Risks*

Howard Kunreuther and Paul K. Freeman

SUMMARY

This chapter examines two broad conditions for a risk to be insurable. Condition 1 requires the insurer to set a pure premium by quantifying the frequency and magnitude of loss associated with specific events associated with the risk. Condition 2 specifies a set of factors, such as adverse selection, moral hazard, and degree of correlated risk, that need to be taken into account when the insurer determines what premium and type of coverage (maximum limits, nature of deductible) it wants to offer. Finally, a risk is not insurable unless there is sufficient demand for the product at some price to cover the upfront costs of developing the product and the expenses associated with marketing policies.

Key Words: insurance, environmental risk, insurability conditions

1. INTRODUCTION

What does it mean to say that a particular risk is insurable? We must address this question from the vantage point of the potential supplier of insurance. We will be focusing on a standard contract between buyer and seller; the insurer offers coverage against a specific risk at some premium R and the insured is protected against a prespecified set of losses defined in the contract.

* The material on which this chapter is based draws heavily on Chapter 4 of a larger study by Paul Freeman and Howard Kunreuther on “Insuring Environmental Risks,” to be published. Support from NSF Grant #5-24603 to the Wharton Risk Management and Decision Processes Center, University of Pennsylvania, Philadelphia, PA, is gratefully acknowledged.
2. TWO INSURABILITY CONDITIONS

Two conditions must be met before insurance providers are willing to provide coverage against an uncertain event. Condition 1 is the ability to identify and, possibly, quantify the risk. The insurer must know that it is possible to estimate what losses they are likely to incur when providing different levels of coverage. Condition 2 is the ability to set premiums for each potential customer or class of customers. This requires some knowledge of the customer's risk in relation to others in the population of potentially insureds.

If Conditions 1 and 2 are both satisfied, a risk is considered to be insurable. But, it still may not be profitable. In other words, it may not be possible to specify a rate where there is sufficient demand to yield a positive profit from offering coverage. In such cases, there will be no market for insurance.

2.1 Condition 1: Identifying the Risk

To satisfy this condition, estimates must be made of the frequency of specific events occurring and the magnitude of the loss should the event occur. Three examples illustrate the type of data that could be used to identify the risk. In some cases, this may enable the insurer to specify a set of estimates on which to base an insurance premium. In other cases, the data may be much less specific.

2.1.1 Fire

Rating agencies typically collect data on all the losses incurred over a period of time for a particular risk and an exposure unit. Suppose the hazard is fire and the exposure unit is a well-defined entity, such as $300,000 wood-frame homes of similar design, to be insured for 1 year in California. The typical measurement is the pure premium (PP), which is given by

\[ PP = \frac{\text{Total Losses} / \text{Exposure Unit}}{} \]  

(1)

Assume that the rating agency has collected data on 100,000 wood-frame homes in that state and has determined that the total annual losses from fires to these structures over the past year is $20 million. If these data are representative of the expected loss to this class of wood-frame homes in California next year, then, using Equation 1, PP is given by

\[ PP = \frac{\$20,000,000}{100,000} = \$200 \]

This figure is simply an average. It does not differentiate between locations of wood-frame homes in the state, the distance of each home from a fire hydrant, or

* The pure premium (PP) normally considers loss adjustment expenses for settling a claim. We will assume that this component is part of total losses. For more details on calculating PPs see Launie et al. (1986).
the quality of the fire department serving different communities. All of these factors are often taken into consideration by underwriters who set final rates by calculating a premium that reflects the risk to particular structures.

### 2.1.2 Earthquakes

If there were considerable data available on annual damage to wood-frame homes in California from earthquakes of different magnitudes, then a similar method to the one described for fire could be used to determine the probability and magnitude of loss.

Due to the infrequency of earthquakes and the relatively few number of homes that have been insured against the earthquake peril, this type of analysis is not feasible at this time. Insurance providers have to turn to scientific studies by seismologists, geologists, and structural engineers to estimate the frequency of earthquakes of different magnitudes, as well as the damage that is likely to occur to different structures from such earthquakes.

Table 1 is a template indicating the type of information that would have to be collected to determine the PP for a wood-frame house subject to earthquake damage in California. The first column (Event) reflects one way of calculating the severity of an earthquake occurring, i.e., the modified Mercalli intensity scale. The second column (Probability) specifies the annual probability \( p_i \) of a wood-frame home in California being damaged in an earthquake. The third column (Loss) is the amount of damage an earthquake might cause to a wood-frame home.

<table>
<thead>
<tr>
<th>Event</th>
<th>Probability ( p_i )</th>
<th>Loss ( L_i )</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI</td>
<td></td>
<td></td>
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<tr>
<td>VII</td>
<td></td>
<td></td>
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<tr>
<td>VIII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Based on the modified Mercalli Intensity Scale.

If all these data are available from scientific studies, the PP in this case would be equivalent to the expected loss \( E(L) \) which is given by

\[
E(L) = p_i \times L_i
\]  

(2)

Over the past 20 years, seismologists have determined certain factors that will influence the probability of an earthquake in a specific area, but they are still uncertain as to how they interact with each other and their relative importance.* At
the same time, there has been considerable damage data collected by engineers since the Alaskan earthquake of 1964, which has increased our understanding of the performance of various types of buildings and structures in earthquakes of different magnitudes.*

While seismologists and geologists cannot predict with certainty the probability of earthquakes of different magnitudes occurring in specific regions of California, they can provide conservative estimates of the risk. For example, it is possible to develop worst-case scenarios for determining $E(L)$ using Equation 2 by computing

$$E(L^*) = p^* \times L^*_i$$

The factor $p^*_i$ is the maximum credible probability assigned by seismologists to an earthquake of intensity $i$. The factor $L^*_i$ represents engineers' best estimates of the maximum likely damage to a wood-frame house in such an earthquake. Using the estimate from Equation 3 as a basis for calculating a PP, the damage to wood-frame homes from earthquakes becomes a quantifiable risk.

### 2.1.3 Underground Storage Tanks (USTs)

Suppose that an insurer was attempting to estimate the PP for a new technological advance, such as an improved design for USTs. Since there are no historical data associated with the risk, the insurer would have to rely on scientific studies to estimate the probabilities ($p_i$) and cleanup costs ($L_i$) associated with a particular type of defect $i$ in the tank that causes a leak.

To the extent that the insurer has confidence in these scientific estimates of the performance of the tank and the costs of the cleanup from leaks of different magnitudes, it should be able to quantify the risk and calculate a PP. If, on the other hand, the insurer is uncertain about the frequency or loss estimates, it may conclude that the risk cannot be quantified and hence is uninsurable.

### 2.2 Condition 2: Setting Premiums for Specific Risks

Once a PP is determined using one of the methods specified, the insurer can determine what rate it needs to charge in order to make a profit by providing coverage against specific risks. There are a number of factors that come into play in determining this dollar figure.

#### 2.2.1 Ambiguity of Risk

Not surprisingly, the higher the uncertainty regarding the probability of a specific loss and its magnitude, the higher the premium will be. As shown by a series of empirical studies, actuaries and underwriters are so ambiguity averse and risk averse

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* Some of these factors are the time elapsed since the last earthquake, tilting of the land surface, fluctuations in the magnetic field, and changes in the electrical resistance of the ground.

* An Office of Technology Assessment (1995) report provides a detailed discussion on the state of the art of earthquake risk assessment and a comprehensive set of references.
that they tend to charge much higher premiums than if the risk were well specified.* A questionnaire was mailed to 896 underwriters in 190 randomly chosen insurance companies to determine what PPs** they would set for either an earthquake or leaking UST risk. The earthquake scenario involved insuring a factory against property damage from a severe earthquake. The UST scenario involved liability coverage for owners of a tank containing toxic chemicals against damages if the tank leaks. A neutral risk scenario acted as a reference point for the two context-based scenarios. It simply provided probability and loss estimates for an unnamed peril.

For each scenario, four cases were presented, reflecting the degree of ambiguity and uncertainty surrounding the probability and loss as shown in Table 2. A well-specified probability \( p \) refers to a situation in which there are considerable past data on a particular event that enable “all experts to agree that the probability of a loss is \( p \).” An ambiguous probability \( Ap\) refers to the case where “there is wide disagreement about the estimate of \( p \) and a high degree of uncertainty among the experts.” A known loss \( L \) indicates that all experts agree that if a specific event occurs, the loss will equal \( L \). An uncertain loss \( UL \) refers to a situation where the experts’ best estimate of a loss is \( L \), but estimates range from \( L_{\min} \) to \( L_{\max} \).

<table>
<thead>
<tr>
<th>Probability</th>
<th>Known</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well specified</td>
<td>( p, L )</td>
<td>( p, UL )</td>
</tr>
<tr>
<td></td>
<td>Life, auto, fire</td>
<td>Playground accidents</td>
</tr>
<tr>
<td>Ambiguous</td>
<td>( Ap, L )</td>
<td>( Ap, UL )</td>
</tr>
<tr>
<td></td>
<td>Satellite, new products</td>
<td>Earthquake, USTs</td>
</tr>
</tbody>
</table>

Case 1 reflects well-known risks for which large, actuarial databases exist, e.g., life, automobile, and fire insurance. Satellite accidents are an example of a Case 2 risk, since there is normally considerable uncertainty regarding the chances of their occurrence. If they do happen, the satellite is destroyed and the loss is well specified. Playground accidents illustrate Case 3 since there are good data on the chances of an accident occurring, but considerable uncertainty as to the magnitude of the liability award should a person be injured or killed. Finally, there is considerable ambiguity and uncertainty related to earthquakes and UST risks, so they are illustrative of Case 4.

In the questionnaire to the underwriters, Case 1 was represented by providing a well-specified probability (e.g., \( p = .01 \)) and a well-specified loss (e.g., \( L = \$1 \) million). The other three cases introduced ambiguity and uncertainty into the

* For more details on the survey and the analysis of findings, see Kunreuther et al. 1995.
** The questionnaire instructions stated that PPs should exclude “loss adjustment expenses, claims expenses, commissions, premium taxes, defense costs, profits, investment return and the time valuation of money.”
picture. For the case where $L = $1 million, the uncertain estimates ranged from $L = $0 to $L = $2 million.

One hundred and seventy-one completed questionnaires (19.1% of the total mailed) were received from 43 insurance companies (22.6% of those solicited). Table 3 shows the ratio of the average PP that underwriters would want to charge for each of the three cases where there is uncertainty and ambiguity in either $p$ and/or $L$ in relation to the average PP they specified for a risk that is well specified (Case 1). The data reveal that underwriters will want to charge a much higher premium when there is ambiguity and uncertainty regarding probabilities and/or losses. For example, as shown in Table 3, the premium for the Case 4 earthquake scenario was 1.5 times higher than for the well-specified Case 1 scenario.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>$p$, $L$ Case 1</th>
<th>$Ap$, $L$ Case 2</th>
<th>$p$, $UL$ Case 3</th>
<th>$Ap$, $UL$ Case 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>1</td>
<td>1.5</td>
<td>1.1</td>
<td>1.7</td>
</tr>
<tr>
<td>(N = 24)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earthquake</td>
<td>1</td>
<td>1.2</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>(N = 23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UST</td>
<td>1</td>
<td>1.5</td>
<td>1.4</td>
<td>1.6</td>
</tr>
<tr>
<td>(N = 32)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a N = Number of respondents.

Data from Kunreuther et al. (1995).

Why do actuaries and underwriters price uncertain and ambiguous risks higher than well-specified risks? In two very insightful papers, Stone (1973a,b) indicates that, in setting premiums for any particular risk, insurers are motivated by the impact that their actions will have on the stability and solvency of their firm. Stability is measured by the loss ratio ($LR$), i.e., paid losses/written premiums, for a particular risk. Stability requires a probability less than some specified level $p'$ (e.g., $p' = .05$) that the loss ratio exceeds a certain target level $LR^*$ (e.g., $LR^* = 1$).

Solvency is measured by the survival constraint that relates aggregate losses for the risk in question to the current surplus plus premiums written. It requires that the probability of insolvency be less than $p''$ (e.g., $p'' = 1$ in 100,000). Berger and Kunreuther (1995) have shown that, if underwriters and actuaries are mindful of the two constraints of stability and solvency, they will set higher premiums as specific risks become more ambiguous and uncertain.

### 2.2.2 Adverse Selection

If the insurer cannot distinguish between the probability of a loss for good and bad risk categories, it faces the problem of adverse selection. What this means is that, if the insurer sets a premium based on the average probability of a loss using the
entire population as a basis for this estimate, only the bad risks will want to purchase coverage. As a result, the insurer will expect to lose money on each policy that is sold.

The assumption underlying adverse selection is that purchasers of insurance have an informational advantage by knowing their risk type. Insurers, on the other hand, must invest considerable expense to collect information to distinguish between risks. A simple example illustrates the problem of adverse selection for a risk where the probabilities of a loss are \( p_G = .1 \) (good risks) and \( p_B = .3 \) (bad risks). For simplicity, assume that the loss is \( L = $100 \) for both groups and that there are an equal number of potentially insurable individuals \( (N = 50) \) in each risk class. Table 4 summarizes these data.

<table>
<thead>
<tr>
<th>Good risks</th>
<th>( p_G = .1 )</th>
<th>( L = 100 )</th>
<th>( N = 50 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad risks</td>
<td>( p_B = .3 )</td>
<td>( L = 100 )</td>
<td>( N = 50 )</td>
</tr>
</tbody>
</table>

In the example in Table 4, the expected loss for a random individual in the population is 20.* If the insurer charged an actuarially fair premium across the entire population, only the bad risk class would normally purchase coverage, since their expected loss is 30 \([.3(100)]\) and they would be pleased to pay only 20 for insurance. The good risks have an expected loss of 10 \([.1(100)]\), so they would have to be extremely risk averse to be interested in paying 20 for coverage. When only the poor risks purchase coverage, the insurer would suffer an expected loss of \(-10 \) \((20 - 30)\) on every policy it sold.

There are two principal ways that insurers can deal with this problem. If the company knows the probabilities associated with good and bad risks, but does not know the characteristics of the individuals, it can raise the premium to at least 30 so that it will not lose money on any individual purchasing coverage. In reality, where there is a spectrum of risks, the insurer may only be able to offer coverage to the worst risk class in order to make a profit. Hence, raising premiums is likely to produce a market failure in that very few of the individuals who are interested in purchasing coverage to cover their risk will actually do so at the going rate.

A second way for the insurer to deal with adverse selection is to offer two different price-coverage contracts. Poor risks will want to purchase contract 1 and good risks will purchase contract 2.** For example, contract 1 could be offered at price = 30 and coverage = 100, while contract 2 could be price = 10 and coverage = 40. If the good risks preferred contract 1 over contract 2 and the poor risks preferred contract 2 over contract 1, this would be one way for the insurers to market coverage to both groups while still breaking even.

Finally, the insurer could require some type of audit or examination to determine the nature of the risk more precisely. In the case of property, the audit could take the form of an inspection of the structure and its contents. For individuals, it could be some type of an examination, e.g., a medical exam if health insurance were being

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* The expected loss for a random individual in the population is calculated as follows: \([50(.1)(100) + 50(.3)(100)] / 100 = 20\).
** This solution has been proposed by Rothschild and Stiglitz (1976).
offered. Certain types of coverage may not lend themselves to an exam, however, due to the nature of the risk. It is difficult to test a person for driving ability, for example, although past records and experience may be useful indicators as to whether a person is a good or bad risk.

Finally, it is important to remember that the problem of adverse selection only emerges if the persons considering the purchase of insurance have more accurate information on the probability of a loss than the firms selling coverage. If the customers have no better data than the underwriters, both groups are on an equal footing. Coverage will be offered at a single premium based on the average risk, and both good and poor risks will want to purchase policies.

2.2.3 Moral Hazard

Providing insurance protection to an individual may serve as an incentive for that person to behave more carelessly than before he/she had coverage. If the insurer cannot predict this behavior and relies on past loss data from uninsured individuals to estimate rates, the resulting premium is likely to be too low to cover losses.

The moral hazard problem is directly related to the difficulty in monitoring and controlling behavior once a person is insured. How do you monitor carelessness? Can you determine when a person decides to collect more on a policy than he/she deserves, e.g., making false claims or moving old furniture to the basement just before a flood hits the house?

The numerical example used previously to illustrate adverse selection can also demonstrate moral hazard. With adverse selection, the insurer cannot distinguish between good and bad risks. Moral hazard is created because the insurer must estimate the premium based on the probability of a loss before insurance is purchased, but the actual probability of a loss is much higher after a policy is sold. Table 5 depicts these data for the case in which there are 100 individuals, each of whom face the same loss of 100. The probability of a loss, however, increases from $p = .1$ before insurance to $p = .3$ after coverage has been purchased.

<table>
<thead>
<tr>
<th>Table 5</th>
<th>Data for Moral Hazard Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before insurance</td>
<td>$p = .1$</td>
</tr>
<tr>
<td>After insurance</td>
<td>$p = .3$</td>
</tr>
</tbody>
</table>

If the insurance company does not know that moral hazard exists, it will sell policies at a price of 10 to reflect the estimated actuarial loss ($.1 \times 100$). The expected loss will be 30, since $p$ increases to .3. Therefore, the firm will lose 20 ($10 - 30$) on each policy it sells.

One way to avoid the problem of moral hazard is to raise the premium to 30 to reflect the increase in the probability ($p$) that occurs once a policy has been purchased. In this case, there will not be a decrease in coverage as there was in the adverse selection example. Those individuals willing to buy coverage at a price of 10 will still want to buy a policy at 30 since they know that their probability of a loss with insurance is .3.
Another way to avoid moral hazard is to introduce deductibles and coinsurance as part of the insurance contract. A deductible of $D$ dollars means that the insured party must pay the first $D$ dollars of any loss. If $D$ is sufficiently large, there will be little incentive for the insureds to behave more carelessly than prior to purchasing coverage because they will be forced to cover a significant portion of the loss themselves.

A related approach is to use coinsurance — the insurer and the firm share the loss together. An 80% coinsurance clause in an insurance policy means that the insurer pays 80% of the loss (above a deductible) and the insured pays the other 20%. As with a deductible, this type of risk sharing encourages safer behavior because the insureds want to avoid having to pay for some of the losses.*

A fourth way of encouraging safer behavior is to place upper limits on the amount of coverage an individual or enterprise can purchase. If the insurer will only provide $500,000 worth of coverage on a structure and contents worth $1 million, then the insured knows he/she will have to incur any residual costs of losses above $500,000.**

Even with these clauses in an insurance contract, the insureds may still behave more carelessly than if they did not have coverage, simply because they are protected against a large portion of the loss. For example, they may decide not to take precautionary measures that would otherwise have been adopted had they not purchased insurance. The cost of these measures may now be viewed as too high relative to the dollar benefits that the insured would receive from this investment.

If the insurer knows in advance that an individual will be less interested in loss reduction activity after purchasing a policy, then it can charge a higher insurance premium to reflect this increased risk or require specific protective measure(s) as a condition of insurance. In either case, this aspect of the moral hazard problem will have been overcome.

### 2.2.4 Correlated Risk

By correlated risks we mean the simultaneous occurrence of many losses from a single event. Natural disasters, such as earthquakes, floods, and hurricanes, illustrate cases where the losses in a community are highly correlated: many homes in the affected area are damaged and destroyed by a single event.

If a risk-averse insurer faces high correlated risks from one event, it may want to charge a higher premium to protect itself against the possibility of experiencing catastrophic losses. An insurer will face this problem if it has too many eggs in one basket, such as mainly providing earthquake coverage to homes in Los Angeles county rather than diversifying across the entire state of California.

To illustrate the impact of correlated risks on the distribution of losses, assume that there are two policies sold against a risk where $p = .1$ and $L = 100$. The actuarial

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* More details on the role of deductibles and coinsurance to reduce the chances of moral hazard can be found in Pauly (1968).

** We are assuming that the firm will not be able to purchase a second insurance policy for $500,000 to supplement the first one and, hence, be fully protected against a loss of $1 million (except for deductibles and coinsurance clauses).
loss for each policy is 10. Table 6 depicts the probability distribution of losses for the two policies when the losses are independent of each other and when they are perfectly correlated.

<table>
<thead>
<tr>
<th>Table 6 Data for Correlated Risk Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risks</strong></td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>Independent</td>
</tr>
<tr>
<td>Perfectly correlated</td>
</tr>
</tbody>
</table>

The expected loss for both the correlated and uncorrelated risks is 20. However, the variance will always be higher for correlated than uncorrelated risks which have the same expected loss. Risk-averse insurers will always want to charge a higher premium for the correlated risk.

Empirical data on the impact of correlated risks on premium-setting behavior comes from a mail survey of professional actuaries who were members of the Casualty Actuarial Society. Of the 1165 individuals who were sent questionnaires, 463 (or 40%) returned valid responses. Each of the actuaries evaluated several scenarios involving hypothetical risks, where the probability of a loss was either known or ambiguous.

One of these scenarios involved a manufacturing company that wants to determine the price of a warranty to cover the $100 cost of repairing a component of a personal computer. Each actuary was asked to specify premiums for both nonambiguous and ambiguous probabilities when losses were either independent or perfectly correlated and \( p = .001, .01, \) and \( .10 \). Table 7 presents the ratios of premiums for correlated risks to independent risks for well-specified and ambiguous probabilities using median estimates of the actuaries’ recommended premiums. If the actuaries perceived no differences between the independent and correlated risks, the ratios would all be 1.

| Table 7 Ratio of Premiums for Correlated Risks to Independent Risks for Scenarios with Nonambiguous (\( p \)) and Ambiguous Probabilities (\( Ap \))

<table>
<thead>
<tr>
<th>Nature of probability</th>
<th>Probability level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( .001 )</td>
</tr>
<tr>
<td>Well specified (( p ))</td>
<td>.910</td>
</tr>
<tr>
<td>Ambiguous (( Ap ))</td>
<td>2.000</td>
</tr>
</tbody>
</table>

\( ^a \) 100,000 units insured; \( L = $100 \).
Data from Hogarth and Kunreuther (1992).

The data reveals a very different story. The median premiums were always higher for the correlated risks except for the case where \( p = .001 \) and the probability is well specified. The ratios were noticeably higher when the probabilities were ambiguous. In fact, when \( p = .01 \), the ratio of median premiums was more than 5.5 times larger for a correlated risk than for an independent risk.
2.2.5 Administrative Costs

The insurer must also be able to recover the costs of analyzing, underwriting, selling and distribution, paying claims, and meeting the regulatory requirements of issuing insurance policies. Generally speaking, these costs, collectively referred to as administrative expenses, are calculated as a percentage of premium dollars paid by an insured.

Administrative costs are also incurred in the process of quantifying risk which involves the following steps:

1. Obtaining a statistical database for estimating the risk
2. Underwriting cost associated with setting the premium using the statistical database
3. Obtaining the necessary regulatory approvals to market a policy
4. Marketing and distribution costs — determining the nature of the demand for the product and then using a sales force to promote the product

2.2.6 Marketability

Even if an insurer determines that a particular risk meets the first two insurability conditions, it will not invest the time and money to develop a product unless it is convinced that there is sufficient demand to cover these costs. An insurer must be able to cover development and marketing costs through its premiums. These costs include upfront costs for product development, as well as the expenses associated with marketing and distribution. The higher these costs, the higher the premium will have to be for a fixed number of customers. The final premium will be a function of the administrative costs and the elasticity of demand with respect to price.

REFERENCES


QUESTIONS

1. Why are insurers more comfortable providing coverage against fire risks than they are against earthquake risks?

2. Suppose you are interested in buying medical insurance because you know that your health is below average of those individuals in your age group. What steps is your insurer likely to take so that they do not sell you coverage unless you pay a premium above the average for your age group?

3. What are the reasons that private insurers have not been interested in providing coverage against risks such as floods? Why can the federal government offer protection against this risk? Note: Federal flood insurance has existed since 1968 because private insurers refused to offer coverage.

4. Suppose a private insurer was interested in providing coverage to protect private contractors who clean up asbestos against those exposed to asbestos fibers who might contract cancer. How would the insurer determine whether such a risk is insurable?