

## Sharing Large and Small Risks

### Catastrophes

Imagine a modest-sized community located on and around the summit of a large hill. Lightning is a serious hazard. Occasionally, someone is killed or severely injured; occasionally, a house is set afire, incurring severe damage. It doesn't happen often, however, and people are otherwise pretty happy living on the hill. But a death or a loss of home through lightning is a family catastrophe. Such a catastrophe has many facets, but one aspect is the economic loss. Something can be done about the economic aspect.

### Sharing economic risk

The economic impact of any such catastrophe can be greatly reduced if it is divided into many small parts and borne collectively by the community. The whole community can chip in to rebuild a house or to pay for the needs of children or other dependents formerly supported by a person who was killed.

This can happen, but will it? Perhaps: it probably depends on the culture, the social structure and the laws of the community. Such sharing can be made more predictable by advance commitment on the part of many people to pay a portion of the costs. It is yet more predictable when there is a fund of money or other goods established in advance to pay for these economic costs; and even more predictable if there is an enforceable contract specifying in advance how much will be paid, to whom, and under what circumstances.

### Insuring against catastrophic risk

The essential point of insurance is to establish such a fund, along with contractual arrangements for payments from the fund. The arrangements need to be understood by all parties. To "purchase insurance" is to enter into such contractual arrangements, and thereby gain a measure of protection from the economic part of catastrophe.

Without such arrangements, a few people, the victims of lightning or other similar catastrophes, bear all the economic costs. Risk sharing does not alleviate all the inequality: death and emotional and physical pain are difficult or impossible to share. Nonetheless, sharing the economic risk can be a relief to everyone involved, actual or potential victims.

The simplest arrangement, well-suited to an isolated hilltop community, is mutual insurance. This is direct sharing of risk by those who perceive themselves to be at risk. They all contribute to the insurance fund, proportional to the amounts they have at risk, and they share in the management of the insurance fund. Thus, for fire insurance, someone whose home would cost \$100,000 to replace contributes about twice as much as someone whose home could be rebuilt for \$50,000. These graded contributions are called

the premiums. Sometimes premiums also take account of likelihood of catastrophe. Someone living right at the summit might have to pay a higher premium than someone living in a safer part of the hill, since it is more likely that the house on the summit will be hit.

## Other insurers

There are various alternatives to mutual insurance. Private-sector companies can be organized to provide insurance, and governments often provide some insurance. For example, the United States government provides survivors and disability insurance through Social Security. The fund for this is built up through tax revenues, especially the social security tax. The U.S. government also provides some health insurance for the retired, funded by the Medicare tax.

THIS IS THE END OF MATERIAL FOR GROUP 1 (CONTROL INSTRUCTIONS)

GROUPS 2 AND 3 CONTINUE.

## Why small risks usually are not insured

Suppose that our modest-sized hilltop community, though not served by any large insurance companies, has managed to set up a workable system for sharing the economic risks of fire and sudden death caused by lightning. Now someone points out that purchasing milk in glass bottles is also a risk: occasionally, a bottle will fall and break as it is carried home, and the milk will go to waste. Why should the community not set up a similar system to share that economic risk? Everyone would chip in a very small amount to create a fund that would be used to replace milk lost in personal accidents.

Of course, such a proposal would not be taken seriously. Spilled milk, though temporarily quite unpleasant, is not an economic catastrophe. People are expected to bear such small economic losses without much fuss. Indeed, everyone is exposed to many small risks. Breaking a milk bottle on the way home is unlikely, for any one person; but practically everyone suffers some small losses from minor accidents or misfortunes, from time to time. Setting up a special fund for any particular type of small loss, such as broken milk bottles, would be silly.

## "Small" is relative

Of course, "small" is relative to wealth or cash flow. An individual who purchases a new automobile for \$18,000 usually purchases collision insurance, because the loss of this amount, in an accident, would be an economic catastrophe. A large automobile rental company, on the other hand, would self-insure. For example, if a rental company has a fleet of 100,000 automobiles, losses due to collisions might require around 1% extra in purchase of new cars. This would be a small increase in costs, not a catastrophe. It would not make sense to pay premiums to an insurance company to cover these fairly predictable extra costs—after all, the insurance company needs to cover its employees'

salaries and to make a profit as well, and that part of the premium would represent an extra cost to the car rental company. Self-insuring saves money, on the average, when the loss involved is not catastrophic.

But for this same company, a series of multi-million dollar lawsuits for injuries and deaths, tied to several of its rental cars, could be catastrophic; and so the company finds it worthwhile to pay something extra to an insurance company to purchase liability insurance, accepting a relatively small extra cost to avoid the risk of a catastrophic loss. The insurance company, in turn, has to be large enough that a few multi-million dollar losses are not catastrophic. It is helping many different companies share the risk for what would be catastrophic for any of them alone.

The general principle that emerges from these examples is that it makes sense (and it is necessary) to self-insure for losses that are small for oneself, and fairly likely to occur, such as spilt milk (or other small accidents). Since insurance costs extra—even in a mutual arrangement, there have to be salaried employees who handle the day-to-day operations of the fund—it does not make sense to pay for it unless you are getting protection from the possibility of catastrophic economic loss.

### Other goals for insurance

Nonetheless, people do sometimes insure against losses that are not catastrophic. For example, someone sending a \$50 gift through the U.S. Postal Service may choose to spend \$1.30 to insure the package. For someone who can afford to give a \$50 gift, the loss of \$50 may be quite unpleasant, but in most cases would not be a catastrophe. The USPS is surely making a lot of money on such insurance. Suppose 1000 people do the same; USPS collects a total of \$1300. It probably loses only one or two \$50 packages out of 1000. Even if it loses 4 in 1000, that is still only \$200 returned to customers, and so \$1100 is kept to pay salaries and defray other costs.

Even though the 1000 customers are losing perhaps \$1100 or \$1200 as a group, they may still feel justified in buying the postal insurance. For them, the average cost is only \$1.10 or \$1.20 each. And each may feel that losing the package would **feel** very bad; knowing that it will be reimbursed would **feel** much better. It is worth \$1.30 to obviate the possibility of such a bad feeling.

This illustrates an emotion-related goal for buying insurance: avoiding the possibility of feeling very bad, or even the anxiety that one might end up feeling bad.

Also, unlike milk carried home, a mailed package leaves one's control at the post office, and there is nothing more one can do by way of extra care. Thus, another possible goal for getting postal insurance is to feel that one has done everything possible to be careful.

### Considering self-insurance as an option

The point is that people do sometimes insure against risks that are non-catastrophic, to reduce the possibility of negative emotions, or just as a way of taking extra care. Since almost any insurance purchase loses money on the average (otherwise, the insurer would

have to charge more in order to pay its own costs and possibly make a profit), one should at least consider the option of self-insuring against a noncatastrophic risk. Are the goals of avoiding a bad feeling or taking extra care worth the money spent on them? If one feels that one would rather have the money and can deal emotionally with non-catastrophic risks and losses, then one's main goal in purchasing insurance should be protection against economic catastrophe.

THIS IS THE END OF MATERIAL FOR GROUP 2 (SMALL-RISK INSTRUCTIONS)  
GROUP 3 (DEDUCTIBLE INSTRUCTIONS) CONTINUES.

### Deductibles as small risks

Many insurance contracts have a deductible: only losses that exceed the deductible are reimbursed. For example, in our hilltop community, property insurance contracts might have a \$1000 deductible. If a home is struck by lightning, but there is only modest damage, say \$600 to repair, then the homeowner must pay for the repair, because this is less than the deductible. If there is huge damage (say \$60,000), then the homeowner pays \$1000 and the insurance fund pays the remaining \$59,000.

The deductible makes sense, in this context, if we assume that a loss of \$1000, although very unpleasant, is not an economic catastrophe for the homeowners in this community. Having such a deductible makes the protection against catastrophe more efficient. The insurance fund is not drained by paying for numerous small losses, and the people who do the day-to-day work of managing the insurance fund do not have to spend their time on such matters. The insurance fund can be run with fewer employees, and so premiums for insurance against the catastrophic losses can be lower.

From the point of view of the homeowner, such a deductible is desirable if it saves enough on the premium for the insurance. If one pays \$100 less per year for insurance, then in 10 years, one has saved \$1000, minus any losses that fall under the deductible; in 30 years, one has saved \$3000, minus any losses that fall under the deductible. If one feels that the chances are good that one will not suffer more than one or two losses in 30 years, then one will probably save \$3000, \$2000, or at least \$1000 (if there are two losses). Of course, one just might suffer a big loss, and have to pay \$1000, the very first year, so one would be \$900 behind. Still, that is unlikely, and if it occurs, it is still not catastrophic.

In the case of postal insurance for a package worth \$50, one can think of the choice as purchasing insurance for \$1.30, with no deductible, or purchasing \$50-deductible insurance for 0 premium (self-insuring is free of charge). If one sends 100 such packages over a number of years, and self-insures, one saves \$130 in premiums, and perhaps suffers no losses, or only one \$50 loss. Even a \$50 loss right now is not catastrophic.

## Undesirable versus desirable deductibles

For health insurance covering routine physician care and referrals to specialists, a \$200 deductible might be very undesirable, because one would end up weighing the advisability of the trip to the doctor against the cost, which one might have to pay fully each time. It might be better to pay up front for 0 deductible, in order to avoid this conflict and get all the advice that one needs from doctors. Indeed, many health policies do offer such full coverage, often with a small co-payment each time, to discourage truly excessive visits to doctors.

On the other hand, for insurance against catastrophic medical expenses, a \$1000 deductible might make a good deal of sense. In the case of serious illness or accident, one does not have a conflict about going to the doctor, one wants the medical care that is needed, and \$1000, though very burdensome for some, will probably not change anything. Thus, if one can get much cheaper protection against catastrophic expenses by self-insuring for the first \$1000 of any major illness, this could well be a good option.