Lecture Notes 13

Moral Hazard

What is "moral hazard"?

- The idea behind moral hazard is that the availability of insurance against an adverse event alters the incentives individuals have to reduce the probability of the adverse event occurring, or to reduce the extent of the loss when the event occurs.

- For example, fire insurance may reduce the incentives to take precautions to avoid a fire or to reduce the loss from a fire should one occur. Insurance against the costs of unforeseen medical treatment may reduce incentives for patients to seek out the most cost–effective way of handling their medical problem, or automobile collision insurance which indemnifies repair costs resulting from an accident may reduce the incentives to monitor automobile repair shops to make sure repairs are done cheaply. Flood insurance might increase the number and/or value of buildings built on a flood plain, so raising the probability and/or extent of damage caused from a flood. These effects on incentives will in turn raise the cost of providing insurance, perhaps to such an extent that none will be provided.

- Note from the examples that the possibility of moral hazard is not always immediately apparent. The presence of insurance cannot alter the likelihood of a flood occurring. However, it is the *damage resulting from the flood* that people insure against, and the probability of a level of damage equal to or greater than a specified amount can be affected by individual behavior. Similarly, insurance against the costs of medical treatment is unlikely to lead people to take fewer precautions against becoming ill, but it will reduce incentives to seek out the least costly method of care.

- We distinguish *self-insurance* – a reduction in the *size* of a loss – from *self-protection* – a reduction in the *probability* of a loss. For example, sprinkler systems reduce the loss from fires but not the probability of a fire starting in the first place; burglar alarms reduce the probability of illegal entry and perhaps also the extent of loss should illegal entry occur. Measures to maintain one's health probably affect the probability of contracting an expensive illness more than the cost of treatment should some illness be contracted. On the other hand, searching for a good doctor or hospital or learning about suitable over–the–counter drugs can reduce the cost of treating an illness should one occur, but probably will do less to reduce the probability of contracting an illness.

Self–Insurance

• Assume first that market insurance is unavailable but that by spending c an individual can reduce the extent of loss in the loss state 0 by $L(c) \geq 0$, with $L'(c) \geq 0$ and $L'' \leq 0$.[1] Note that we assume the individual spends c for sure and therefore reduces his or her income in both the loss state 0 and the no–loss state 1.

• Again we shall assume that individuals are expected utility maximizers. Let wealth in the no-loss state be W and let d be the monetary value of the loss, so W–d is endowed wealth in the loss state.

• The individual then chooses c to maximize

$$V = (1-p)U(W-c) + pU(W-d+L(c)-c) \tag{1}$$

• The FONC for a maximum of V with respect to c is

$$-(1-p)U'(W_1) - pU'(W_0)[1 - L'(c)] = 0 \tag{2}$$

where we have put

$$W_1 = W-c$$
$$W_0 = W - d + L(c) - c \tag{3}$$

We can rewrite the first order condition (2)

$$-\frac{1}{1 - L'(c)} = \frac{p}{1-p}\frac{U'(W_0)}{U'(W_1)} \tag{4}$$

• The second order sufficient condition for this problem is

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1. Note that we could use a similar model in a situation where an individual could increase income in the *no-loss* state and reduce income in the loss state by deliberately exposing himself to hazards – for example, by committing a crime or engaging in a risky legal occupation.

$$D = (1-p)U''(W_1) + pU'(W_0)L''(c) + pU''(W_0)(1 - L'(c))^2 < 0 \quad (5)$$

The second order sufficient condition will hold if $U'' < 0$ and $L'' < 0$; that is, if the marginal utility of income and the marginal productivity of self-insurance are decreasing.

- Assume $U'' < 0$ and $L'' < 0$. Then indifference curves in (W_0,W_1) space will be concave and the transformation curve convex as in Figure 1.

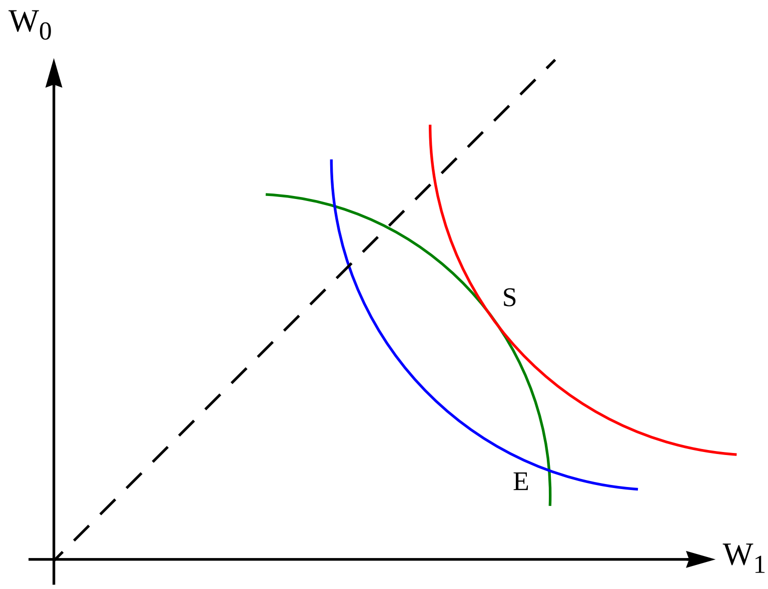

Figure 1: Self-insurance in the absence of market insurance

- Note from (4) that a *necessary* condition for a positive amount of self-insurance is

$$L'(c) > 1 \quad (6)$$

or that there be a *net* addition to wealth in the loss state 0 from engaging in self-insurance.

- A *sufficient* condition for positive self-insurance (assuming the U and L functions are smooth) is that

$$\left.\frac{\partial V}{\partial c}\right|_{c\,=\,0} > 0 \quad (7)$$

which, using (3) and the left hand side of (2) can be expressed as the condition

$$(1-p)\, U'(W) < -\, pU'(W-d)\, [1 - L'(0)] \quad (8)$$

or $$-\frac{1}{1-L'(0)} < \frac{p}{1-p}\frac{U'(W-d)}{U'(W)} \tag{9}$$

• In particular, (9) implies that if p is very small (that is, this is a rare loss) the incentive to self-insure is reduced and c may be zero. The reason is that the price of self-insurance $(-1/(1-L'(c)))$ is independent of the probability of loss so the loading factor (departure of price from $p/(1-p)$) increases as p decreases.

• Now use the first order condition for a maximum to derive the effect of a change in the size of the loss being insured, d. Differentiate the first order condition (2) with respect to d to find:

$$D\frac{\partial c}{\partial d} + pU''(W_0)[1-L'(c)] = 0. \tag{10}$$

Equation (10) can be rearranged to yield

$$\frac{\partial c}{\partial d} = -\frac{pU''(I_0)[1-L'(c)]}{D} > 0 \tag{11}$$

where we have used the second order sufficient condition (5) together with the assumption the individual is risk averse and condition (6) to sign (11). We conclude that if a risk averse individual is initially undertaking some self-insurance, an increase in the damage associated with the insured event will raise the demand for self-insurance.

Market insurance and incentives to self-insure

• Now suppose market and self-insurance are both available. Let S be the quantity of market insurance purchased. Assume the market insurance is available at a price π independent of the quantity of market insurance purchased. Then expected utility with both market and self-insurance becomes

$$V = (1-p)\, U(W-c-S\pi) + pU(W-d+L(c)-c+S) \tag{12}$$

This expected utility function is now to be maximized by a choice of both c and S. The FONC for a maximum of V with respect to c and S are

$$-(1-p)U'(W_1)\pi + pU'(W_0) = 0 \quad (13)$$

$$-(1-p)U'(W_1) - pU'(W_0)[1 - L'(c)] = 0 \quad (14)$$

and where we have again used subscripts on W to denote final wealth levels in the two states:

$$W_1 = W - c - S\pi \quad (15)$$

$$W_0 = W - d + L(c) - c + S \quad (16)$$

From (13) and (14) we can conclude[2]

$$\pi = -\frac{1}{1 - L'(c)} \quad (17)$$

• In equilibrium, the "shadow price" of self-insurance will equal the price of market insurance. The equilibrium is illustrated in Figure 2.

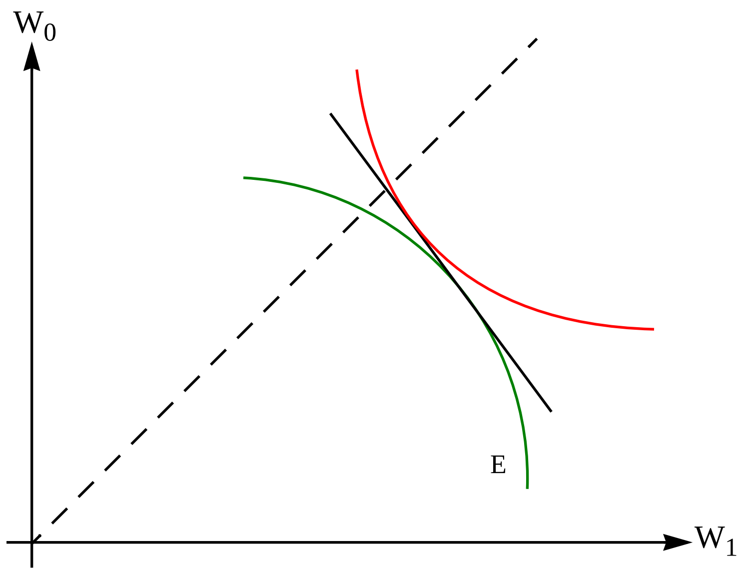

Figure 2: Simultaneous use of self-insurance and market insurance

<u>Effects of a change in π</u>

• From the point of view of moral hazard, we are most interested in whether an increase in the price

[2] Equation (17) implies that when market insurance is available at a "fair price" the choice of c is determined by $-\frac{1}{1-L'} = \frac{p}{1-p}$ or the choice of c which maximizes expected income. Even with $U'' < 0$, a person would act *as if* he were risk neutral and choose the amount of self-insurance which maximized his expected income.

of market insurance increases or decreases self-insurance. The basic contention of the moral hazard argument is that a decrease in the price of market insurance leads to reduced expenditure on self-insurance, thus raising the extent of losses suffered by the insured party. Such an increase in losses would in turn raise the costs of providing insurance for the insurance company.

- As in the first set of notes on insurance, we examine the effect of a change in π by differentiating the FONC (13)–(14) with respect to π. First, we need to examine the SOSC for a maximum of V with respect to c and S. Since we are now maximizing with respect to two variables these become:

$$V_{SS} = (1-p)\pi^2 U''(W_1) + pU''(W_0) < 0 \tag{18}$$

$$V_{cc} = (1-p)U''(W_1) + pU''(W_0)[1 - L'(c)]^2 + pU'(W_0)L''(c) < 0 \tag{19}$$

and

$$\Delta = \begin{vmatrix} V_{SS} & V_{Sc} \\ V_{cS} & V_{cc} \end{vmatrix} > 0 \tag{20}$$

where

$$V_{Sc} = V_{cS} = (1-p)\pi U''(W_1) - pU''(W_0)(1 - L') \tag{21}$$

Note that the determinant in (20) can be evaluated as

$$\Delta = U''(W_0)U''(W_1)p(1-p)[1+\pi(1-L')]^2 + pU'(W_0)L''[(1-p)\pi^2 U''(W_1)+pU''(W_0)] \tag{22}$$

and at the optimum where (17) implies $\pi(1-L') = -1$ equation (22) can be simplified to

$$\Delta = pU'(W_0)L''[(1-p)\pi^2 U''(W_1)+pU''(W_0)] \tag{23}$$

Hence, $\Delta > 0$ at the values which satisfy the first order conditions if $L'' < 0$, $U' > 0$ and $U'' < 0$. Again we shall assume these conditions hold.

- Now look at the effect of a change in π by differentiating the FONC (13)–(14) with respect to π:

$$\begin{bmatrix} V_{SS} & V_{Sc} \\ V_{cS} & V_{cc} \end{bmatrix} \begin{bmatrix} \frac{dS}{d\pi} \\ \frac{dc}{d\pi} \end{bmatrix} = \begin{bmatrix} (1-p)U'(W_1) - (1-p)S\pi U''(W_1) \\ -(1-p)U''(W_1)S \end{bmatrix} \tag{24}$$

Solve the set of equations (24) for the derivatives of S and c using Cramer's Rule:

$$\frac{dc}{d\pi} = \frac{1}{\Delta}\{-(1-p)U''(W_1)SV_{SS} - (1-p)U'(W_1)V_{cS} + (1-p)S\pi U''(W_1)V_{cS}\} \tag{25}$$

$$= \frac{1}{\Delta}\{-(1-p)U'(W_1)U''(W_1)\pi + p(1-p)U'(W_1)U''(W_0)[1-L'(c)]\} > 0$$

$$\frac{dS}{d\pi} = \frac{1}{\Delta}\{(1-p)U''(W_1)SV_{cS} + (1-p)U'(W_1)V_{cc} - (1-p)S\pi U''(W_1)V_{cc}\} \tag{26}$$

$$= \frac{1}{\Delta}\{(1-p)^2U'(W_1)U''(W_1) + p(1-p)U'(W_1)U''(W_0)[1-L'(c)]^2$$

$$+ p(1-p)U'(W_1)U'(W_0)L'' - p(1-p)U'(W_0)U''(W_1)S\pi L''\} < 0$$

where we have substituted $\pi(1–L'(c)) = –1$ from (17).

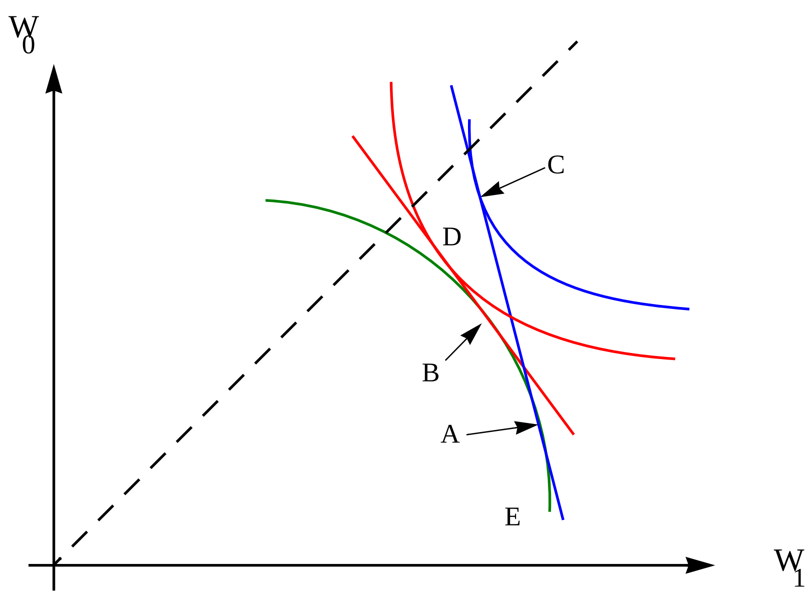

Figure 3: The effect on self-insurance of a change in the price of market insurance

- In particular, (25) and (26) imply that an increase in the price of market insurance π increases self-insurance c and decreases the purchase of market insurance S. Market insurance and self-insurance are in this sense substitutes. The effect of a change in π on self-insurance is illustrated in

Figure 3. In Figure 3, A represents the initial self-insurance point and B the self-insurance point when the price of market insurance is raised. The initial quantity of market insurance purchased is AC while the final quantity is the smaller amount DB.

• Also observe from Figure 4 that self-insurance is reduced by the introduction of market insurance. Before market insurance is available, the individual will self-insure at D. An insurance firm basing its premium on the initial situation as depicted at D will find the size of payments after insurance greater than it anticipated since the pre-insurance state incomes will change from D to A as individuals reduce the degree of self-insurance and purchase market insurance to take them to post-insurance state incomes as at C.

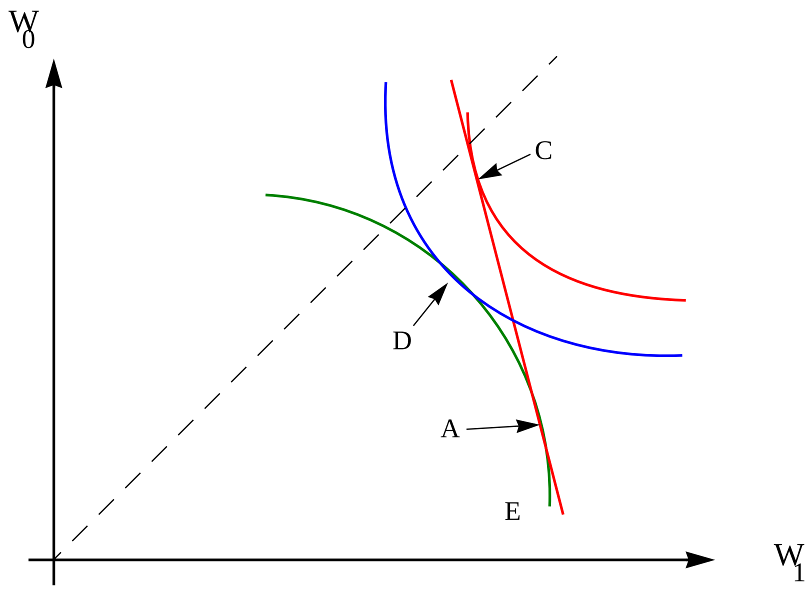

Figure 4: The effect on self-insurance of introducing market insurance

Self–Protection

• Self-insurance and market insurance both redistribute income toward hazardous states, whereas self-protection reduces the probabilities of these states occurring.

• Let the probability of occurrence of the event be

$$p = p(r),\ p'(r) \le 0,\ p''(r) \ge 0, \tag{27}$$

where r is expenditure on self-protection. To begin with assume no market or self-insurance is available. Then r will be chosen to maximize

$$V = [1-p(r)]U(W-r) + p(r)U(W-d-r) \quad (28)$$

For convenience, again denote wealth in the two states after expenditure on self-protection by

$$W_1 = W-r \text{ and } W_0 = W-d-r \quad (29)$$

- The first order condition for a maximum of V in (28) with respect to r is

$$-p'(r)[U(W_1)-U(W_0)] = (1-p(r))U'(W_1) + p(r)U'(W_0) \quad (30)$$

The left hand side of (30) represents the marginal benefit of a reduction in the probability of the accident occurring, while the right hand side measures the decline in utility due to the decline in *both* incomes as a result of increased expenditure on self-protection – or the marginal cost of self-protection. The second order sufficient condition for a maximum is

$$V_{rr} = -p''(r)[U(W_1)-U(W_0)] + 2p'(r)[U'(W_1)-U'(W_0)] + (1-p(r))U''(W_1) + p(r)U''(W_0) < 0 \quad (31)$$

Observe that $U'' < 0$ is neither necessary nor sufficient for the SOSC (31) to hold. The incentive to self-protect, unlike the incentive to self-insure, is not so dependent on attitudes toward risk.[3]

- We can represent self-protection for a risk averse individual with Figure 5. The move from E to F reduces income in both states by the same amount r and thus the move is parallel to the 45° line. However, it also "tilts" the indifference map since it reduces the probability of the adverse event occurring. The expected utility level V_2 exceeds the expected utility level V_1 since along the 45° line expected utility is just equal to the utility of income. Then since V_2 intersects the 45° line to the right of the intersection point for V_1, it represents a level of expected utility greater than V_1. Thus self-protection reduces expected utility by moving the endowment point E toward the origin but increases expected utility by "tilting" the indifference map making the negative event less

3. Thus criminals might be risk loving, since they take action to *increase* the variation in their income in the loss (capture) and non-loss (escape) states, but they may still take action to decrease the probability of the loss state occurring (that is, they will still try to evade the police or cover-up their crime) even if they are risk loving.

probable. Expected utility is maximized by trading off these two effects at the margin.

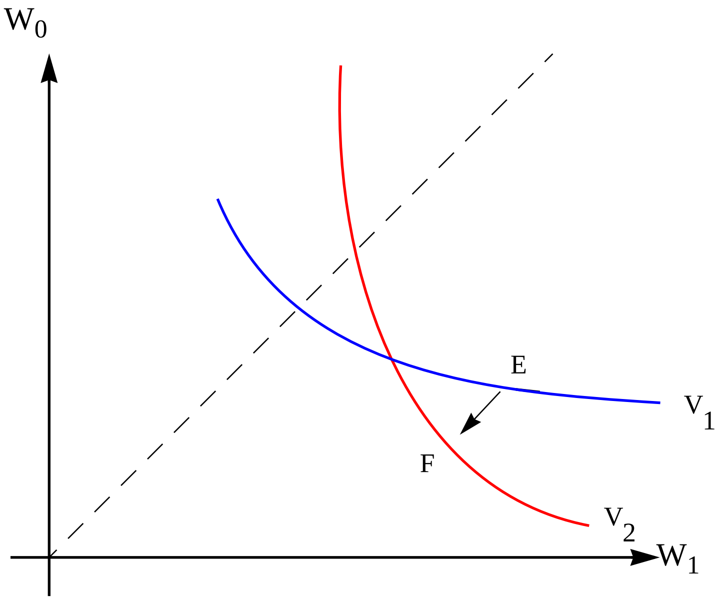

Figure 5: The effect of self-protection for a risk averse individual

We can see from Figure 6 that a risk-lover may also engage in self-protection.

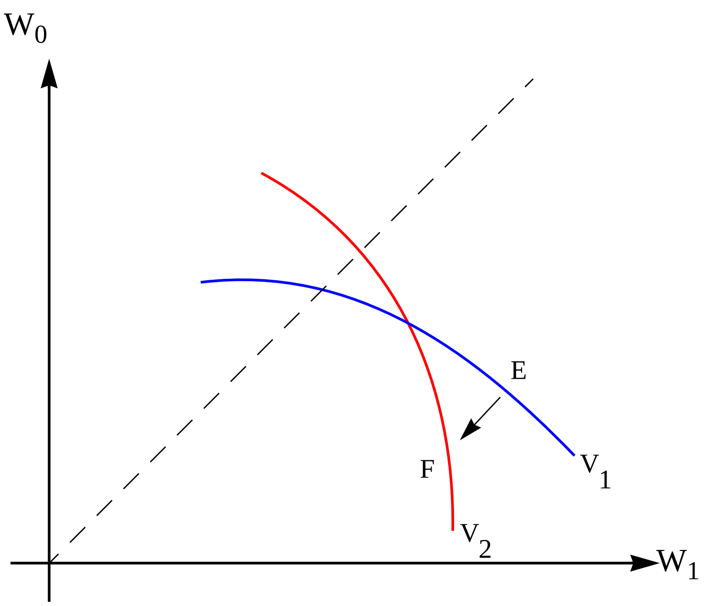

Figure 6: The effect of self-protection for a risk loving individual

• Now consider the effect on self-protection of an increase in damages d in the loss state 0. Do this by differentiating the first order condition (30) with respect to d:

$$V_{rr}\frac{\partial r}{\partial d} - p'(r)U'(W_0) + p(r)U''(W_0) = 0 . \quad (32)$$

Equation (32) can be rearranged to yield

$$\frac{\partial r}{\partial d} = \frac{p'U'(W_0) - pU''(W_0)}{V_{rr}}. \qquad (33)$$

Since the SOSC (31) implies $V_{rr} < 0$, the derivative in (33) is positive if and only if the numerator is negative:

$$p'U'(W_0) < pU''(W_0) \qquad (34)$$

Recall that $p' < 0$ and we are assuming $U' > 0$. Hence, if $U'' < 0$, a decrease in the size of the loss *may or may not* decrease the demand for self-protection. If $U'' > 0$, on the other hand, an increase in d *will* increase the demand for self-protection.

- For both risk averse and risk loving individuals, an increase in d raises the marginal benefit of self-protection which is given by $-p'(r)[U(W_1)-U(W_0)]$. For risk lovers, an increase in d also lowers the marginal cost of self-protection, which is given by $(1-p(r))U'(W_1)+p(r)U'(W_0)$, and so produces an unambiguous decline in r.[4] For risk averse individuals, the decline in the size of income loss in the loss state reduces the marginal cost as well as the marginal benefit of self-protection so the net effect on r can be either positive or negative.

- In terms of Figure 5 and Figure 6, an increase in d holding W constant amounts to a move of E in the vertical direction. The algebraic analysis tells us that such a move in E will necessarily reduce self-protection for risk lovers but may increase or decrease self-protection for risk averse individuals.

<u>Effect of market insurance on self–protection</u>

- The key issue we are interested in from the point of view of moral hazard is the effect of the availability of market insurance on self protection. The key factor in determining this effect is the response of the market insurance premium to the degree of self-protection.

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[4]. Again if criminals are risk lovers, this says that an increase in the severity of a penalty will unambiguously increase the criminal's efforts to avoid capture.

• Since self-protection reduces the probability of occurrence of the loss, it also reduces the cost of providing market insurance. The insurance firm might charge lower premiums for individuals who engage in self-protection – either because the insurance firm can monitor expenditure on self-protection, or it allows individuals to self-select different policies (adverse selection).

• For example, fire insurance premiums could be lower for firms that have installed a sprinkler system or moved combustible materials away from their buildings; or car or house theft insurance premiums could be lower for individuals who have installed alarms. Health or life insurance premiums might be lower for individuals who can prove they do not smoke.[5] Alternatively, lower deductible policies might be offered with the expectation that only individuals who have greater opportunities for self-protection will find those policies attractive. The premiums on the high deductible policies will reflect the claims history and therefore be lower for individuals who practice more self-protection.

• Although one means of allowing insurance premiums to respond to self-protection might involve adverse selection, we shall not impose the self-selection constraint on policies for low risk individuals. Combining analysis of self-protection with adverse selection makes the problem much more difficult.

• With market insurance available at a price $\pi(r)$, expected utility becomes

$$V = (1 - p(r))\,U(W - r - S\pi(r)) + p(r)U(W - d - r + S) \tag{35}$$

Now the individual chooses S *and* r to maximize V.

• We allow for the possibility that the availability of market insurance will result in zero expenditure on self-protection. If a non–zero expenditure on self-protection is (locally) optimal, the partial derivative of V with respect to r will be zero at some non–zero value of r. We shall call such a solution an *interior solution* of the maximization problem. If zero expenditure is a local maxi-

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[5] The insurance company might simply ask people if they smoke – and use blood or saliva tests on a sample of self-declared non-smokers to test their veracity. If someone obtains health insurance by lying about their smoking habits, the insurance company can refuse to pay later claims that can be shown to result from smoking-related illnesses.

mum of V, then the partial derivative of V at r = 0 is negative (so increases in r decrease V). The first order conditions for an *interior* maximum of V are

$$-(1-p)\pi U'(W_1) + pU'(W_0) = 0 \tag{36}$$

$$-p'(r)[U(W_1)-U(W_0)] - (1-p)U'(W_1)(1+S\pi'(r)) - pU'(W_0) = 0 \tag{37}$$

• From the first order condition for r (equation (37)) we can see that the availability of market insurance has two opposite effects on self-protection. On the one hand, self-protection is discouraged because its marginal benefit is reduced by the reduction in $U(W_1)-U(W_0)$. On the other hand, it is encouraged if the price of market insurance is negatively related to the amount spent on self-protection. We shall examine the two polar cases where π responds to changes in p one–for–one and where π is independent of expenditures on r. In both cases, we restrict attention to the case where consumers are risk averse $U'' < 0$.

Case (i) – π is independent of expenditures on self-protection

• Suppose the insurance premium matches the probability of someone who spends nothing on self-protection

$$\pi = \frac{p(0)}{1-p(0)} \tag{38}$$

and $\pi' = 0$.

• From (36), $W_1 = W_0$ at r = 0 (using $U'' < 0$). Then from (37) evaluated at r = 0 we get

$$\left.\frac{\partial V}{\partial r}\right|_{r=0} = -(1-p(0))U'(W_1) - p(0)U'(W_0) = -U'(W_1) < 0 \tag{39}$$

with

$$\left.\frac{\partial^2 V}{\partial r^2}\right|_{r=0} = (1-p(0))U''(W_1) + p(0)U''(W_0) < 0 \quad \text{for } U'' < 0 \tag{40}$$

Hence, r = 0 is a local maximum. To show it is a global maximum it is sufficient to show that

$\partial^2V/\partial r^2 \leq 0$ for any interior maximizing choice of S and r. But $V_{rr} \leq 0$ is one of the sufficient conditions for the solution to the first order conditions to be a maximum rather than a minimum. As with the case where there is no market insurance, $U'' < 0$ is neither necessary nor sufficient for this condition to hold.[6] In general, we need to further restrict p(r) or U to ensure the sufficient conditions for a maximum hold. However, once we do that, we will also have that $V_{rr} \leq 0$ and hence that r = 0 will be a global maximum in the case where π does not adjust to r.

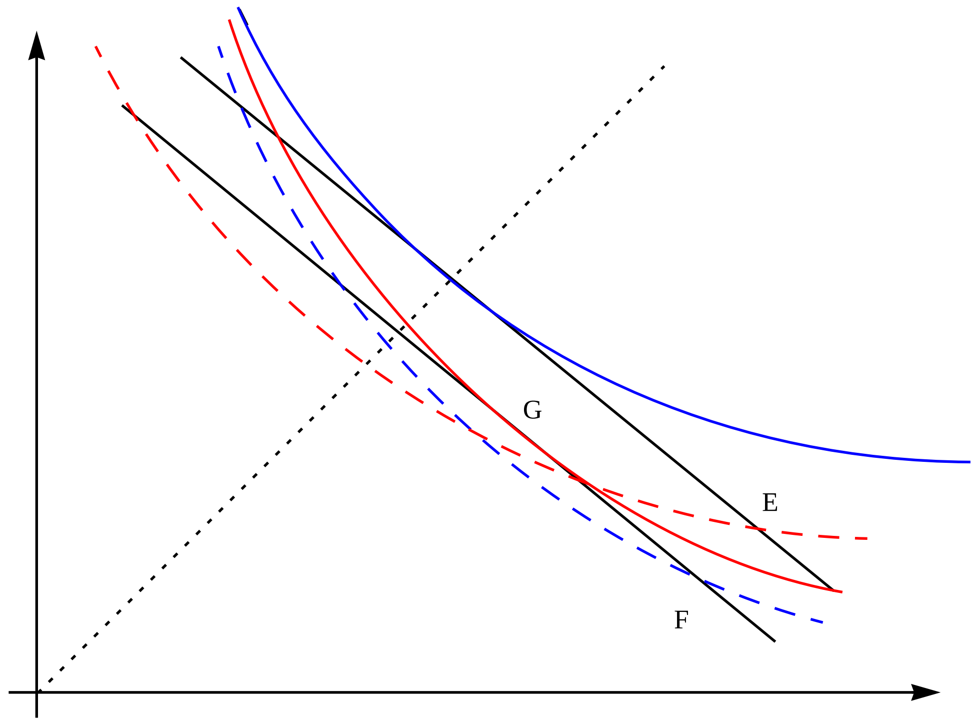

Figure 7: Insurance prices do not adjust to reflect self-protection

- *Thus, if the price of market insurance does not reflect the lower probability associated with expenditure on self-protection, the individual will not engage in any self-protection*. There will be moral hazard associated with the supply of market insurance. Market insurance lowers the marginal benefit of self-protection by reducing $U(W_1)–U(W_0)$. If $\pi' = 0$, there is no offsetting reduc-

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[6]. Specifically, differentiating (37), $V_{rr} = – p''(r)[U(W_1) – U(W_0)] – 2p'(r)[U'(W_0) – U'(W_1)] + (1–p)U''(W_1) + pU''(W_0)$ and from (36) above we have $\frac{U'(W_0)}{U'(W_1)} = \frac{\pi(1-p)}{p} > 1 \Rightarrow U'(W_0) > U'(W_1) \Rightarrow W_0 < W_1$, while from (37) we have $p[U'(W_0) – U'(W_1)] = –p'(r)[U(W_1) – U(W_0)] – U'(W_1)$. Risk aversion implies $U'' < 0$, while we also have $p' \leq 0$ and $p'' \geq 0$. Also, $W_1 > W_0$ and $U' > 0$ together imply $U(W_1) > U(W_0)$. Therefore, the only term in $\partial^2V/\partial r^2$ which is positive is $-2p'(r)[U'(W_0)-U'(W_1)]$.

tion in marginal cost so the individual abandons self-protection.

- We can illustrate the result with Figure 7. Here E is the initial endowment point. With no market insurance, the individual would self-protect by moving to F. With market insurance, the individual would fully insure from E. Market insurance at odds corresponding to p(0) is no longer "fair" at F so the individual would not fully insure after self-protecting. The best he could do with self-protection and market insurance is G, which is inferior to the expected utility obtainable buying fair insurance from E.

Case (ii) – π adjusts to fully reflect expenditures on self-protection

- Again the first of the first order condition (36) will imply $U'(W_1) = U'(W_0)$ and hence $W_1 = W_0$. Now, however, we have

$$\pi(r) = \frac{p(r)}{1 - p(r)} \tag{41}$$

and hence

$$\pi'(r) = \frac{p'(r)}{(1 - p)^2} \tag{42}$$

Substitute $W_1 = W_0$ and (42) into the second first order condition (37) to get

$$-(1 - p)U'(W_1)\left[1 + \frac{Sp'(r)}{(1 - p)^2}\right] - pU'(W_1) = 0 \tag{43}$$

for an interior solution for self-protection r. Equation (43) can be rearranged to yield

$$p(1-p) + (1-p)^2 = -Sp'(r)$$

or

$$p'(r) = -\frac{1 - p}{S} \tag{44}$$

- Now observe that, since $W_1 = W_0$ at the maximum,

$$W - r - S\pi(r) = W_1 = W_0 = W - d - r + S$$

or

$$S(1 + \pi(r)) = d \tag{45}$$

Now use the expression (41) for $\pi(r)$ in (45) to get

$$S = (1-p)d \tag{46}$$

Thus, (44) and (46) together imply that at the maximum

$$p'(r) = -\frac{1}{d} \tag{47}$$

It can be shown, however, that (47) is the condition to maximize expected income.[7]

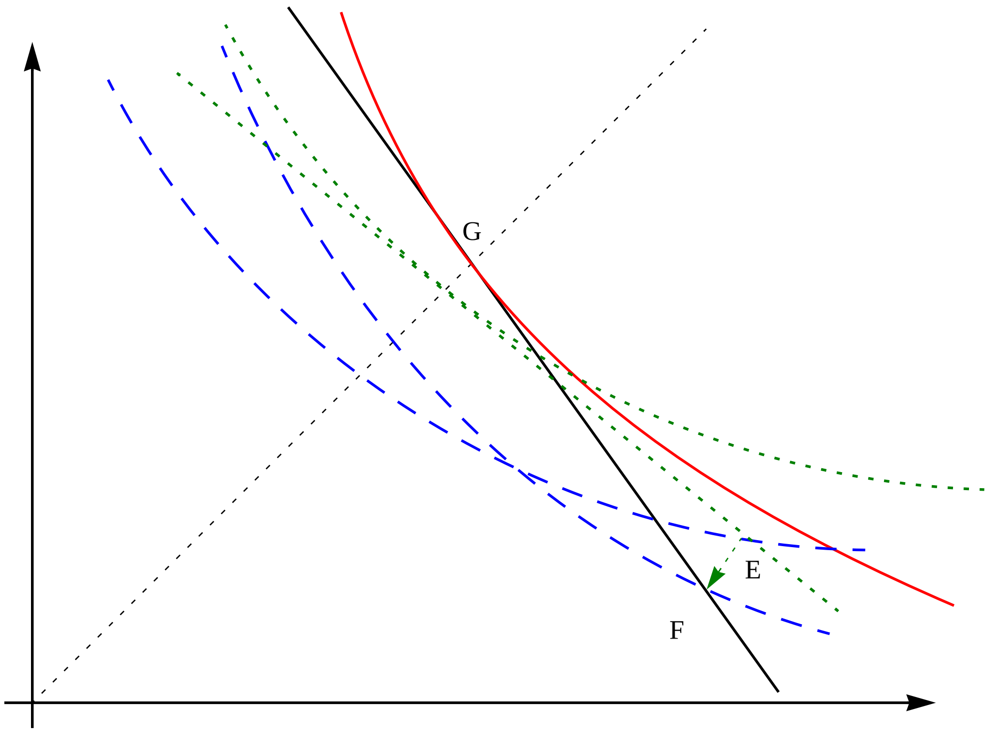

Figure 8: Insurance prices fully reflect expenditures on self-protection

- We can represent the situation graphically as in Figure 8. Here, the price of market insurance adjusts to reflect the reduction in probability so that the individual can buy full insurance both before and after self-protecting.

- As with self-insurance, a "fair price" of market insurance encourages expenditure on self-protection that maximizes expected income. Moral hazard does not in this case increase the cost of in-

[7]. Expected income is $(1-p(r))(W-r-S\pi(r)) + p(r)(W-d-r+S)$. Differentiate with respect to r to find the maximizing r $-(1-p)-S(1-p)\pi'-p'(W-r-S\pi)-p+p'(W-d-r+S) = 0$. But $-S(1-p)\pi' + S\pi p' + Sp' = Sp'\left[-\frac{1}{1-p} + \frac{p}{1-p} + 1\right] = 0$.

Thus the first order condition for a maximum of expected income is $p'(r) = -\frac{1}{d}$.

surance. Further, the maximizing r for this case can be larger than the amount spent on self-protection when market insurance is unavailable.

<u>Concluding Remarks</u>

- Moral hazard can be a problem when insurance rates cannot be adjusted to reflect the probability of occurrence of an adverse event of a given sized loss. However, when insurance rates *do* reflect the cost of providing insurance coverage to the individual, adjusting the degree of self-insurance and self-protection represents an efficient use of the alternative mechanisms for reducing risk, including risk pooling and the use of diversification on the stock market.

- How can insurance firms adjust insurance premiums to reflect the expected loss of an adverse event? They use experience rating to adjust premiums in response to the claims history. They offer lower premiums for firms or individuals engaging in easily monitored self-insurance or self-protection such as the installment of safety devices, sprinklers, alarms etc. They can categorize individuals into different risk classes and then offer policies that more closely reflect the individual accident probabilities – so giving individuals the appropriate incentives to self-insure or self-protect.

- Often, however, insurance firms are prevented from using some of these mechanisms. Governments might object to experience rating in some circumstances – such as for health insurance – on the grounds that it “financially penalizes” the unlucky or the chronically afflicted. Also, governments might attempt to enforce a pooling equilibrium, maybe (for political motives) to overcome categorization of customers, or to avoid the under-insurance of low risk customers when customers cannot be explicitly categorized.

- In a pooling equilibrium, both the high risk and low risk customers will face an insurance rate different from their true accident probabilities and hence will not face the right incentives to self-insure or self-protect. Such inefficiency may, of course, be a price a government is prepared to pay to achieve distributional objectives. It might be less than the costs of achieving the same redistribution through the tax system. After all, taxes also lead to efficiency losses. On the other hand, the policy might be favored even if it is less efficient than alternative, more explicit redistribution, precisely because the redistribution through pooling is “hidden” from many voters.