

Decision Making Under Uncertainty and Asymmetric information

Expected Utility

Insurance Premium

Risk Return Analysis

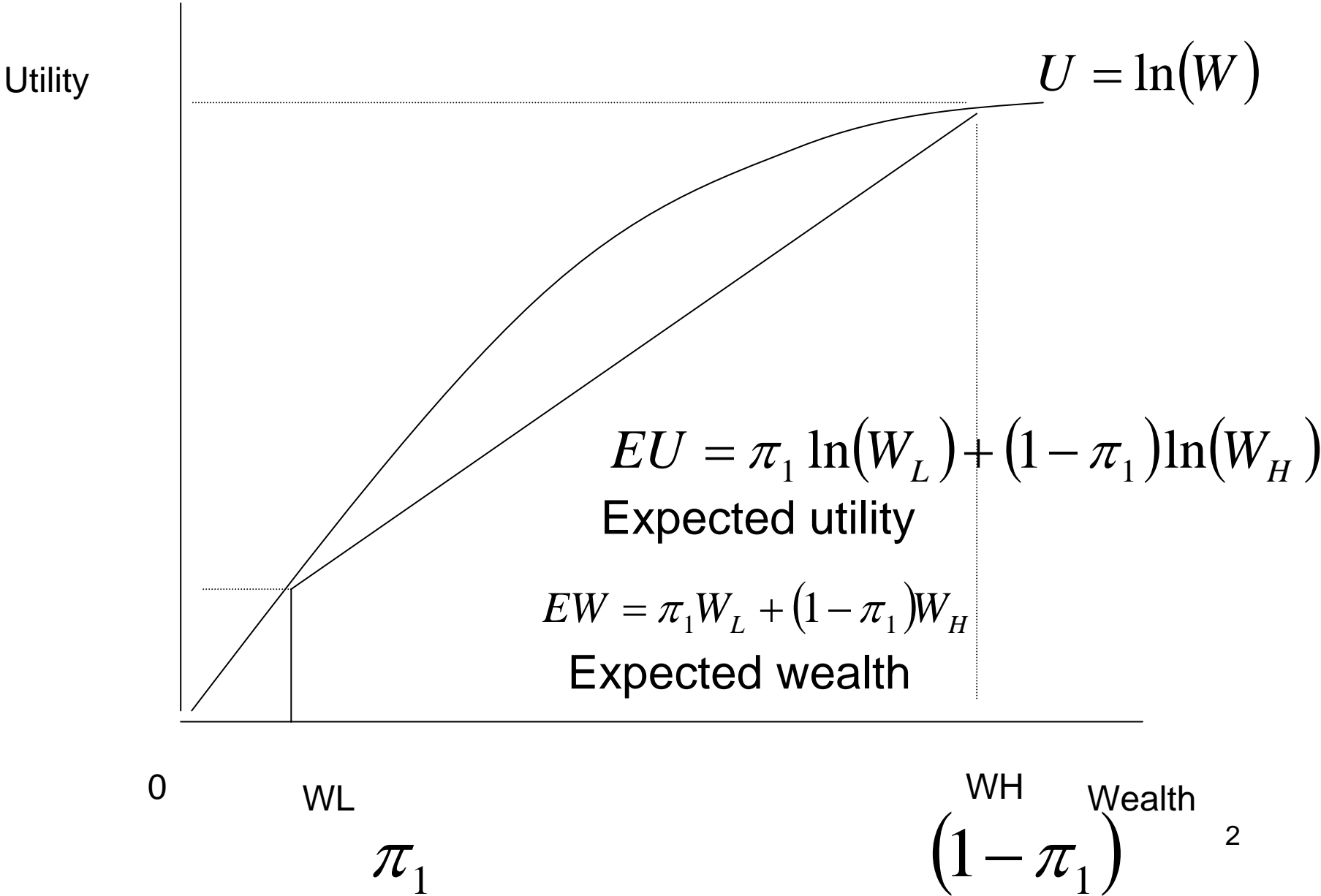
Asymmetric information

Moral Hazard (Hidden action)

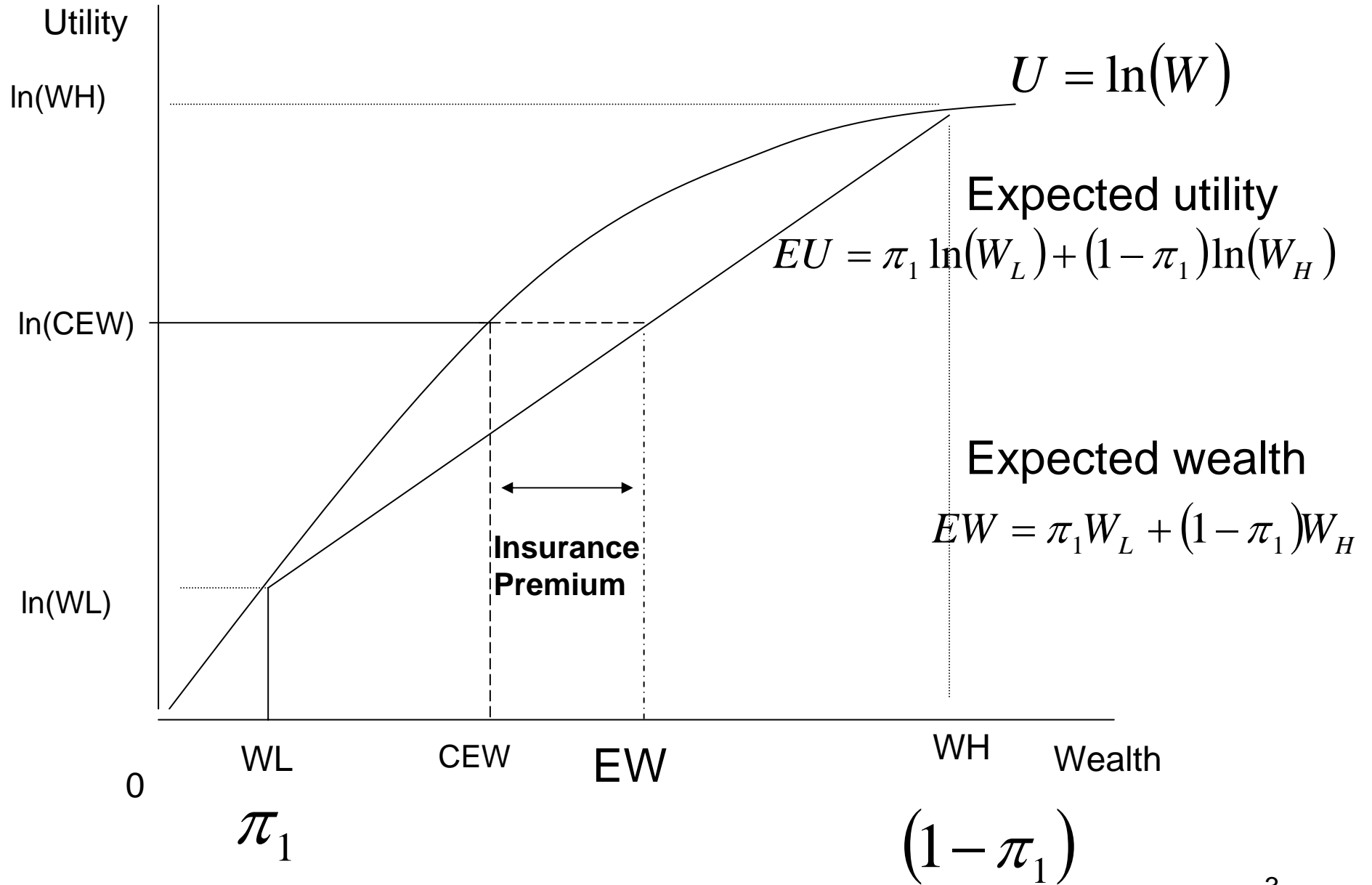
Adverse Selection (Hidden information)

<http://cepa.newschool.edu/het/home.htm>

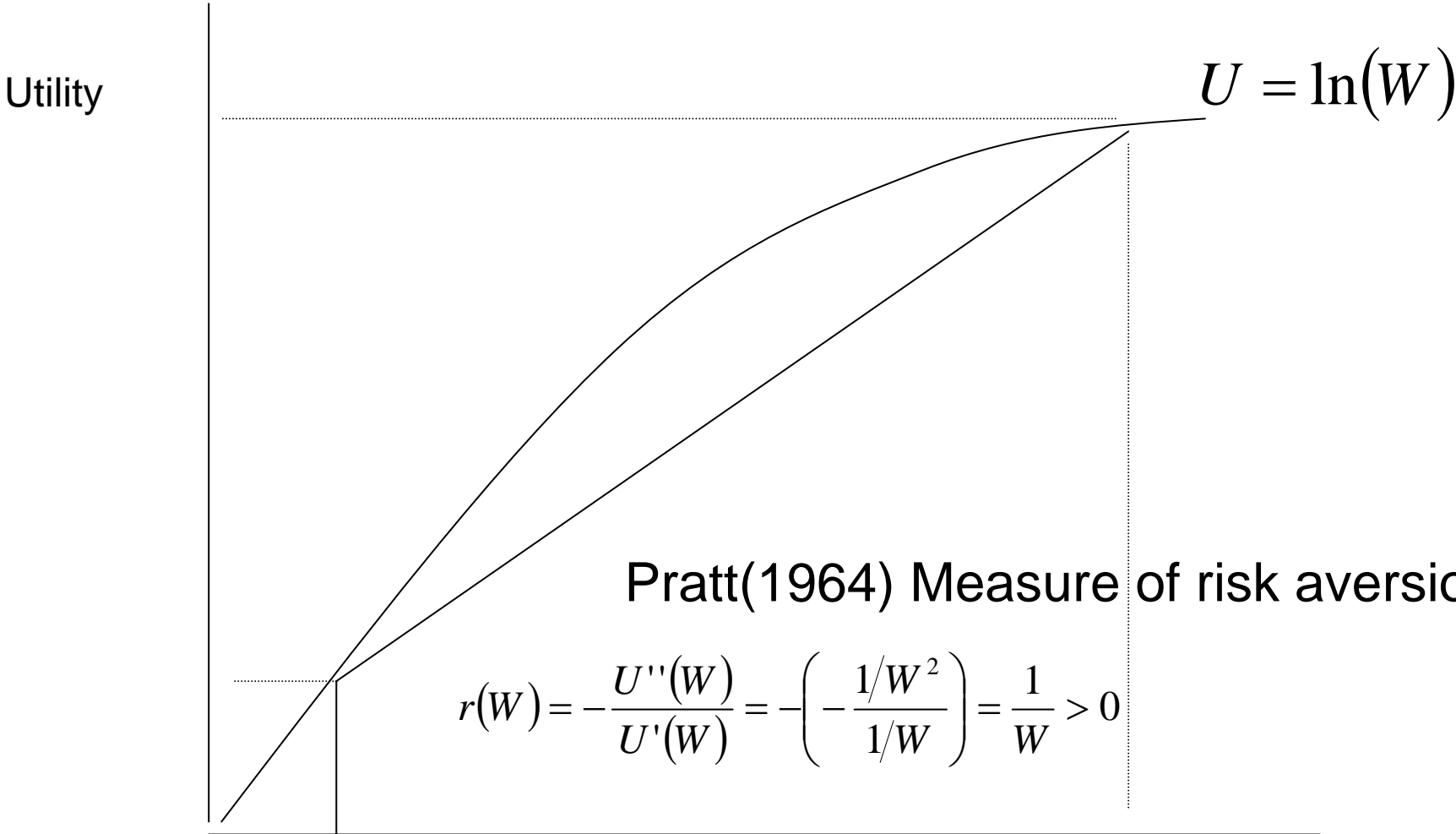
Utility Function for Risk Averse Individual



Utility Function for Risk Averse Individual



Utility Function for Risk Averse Individual



0

WL

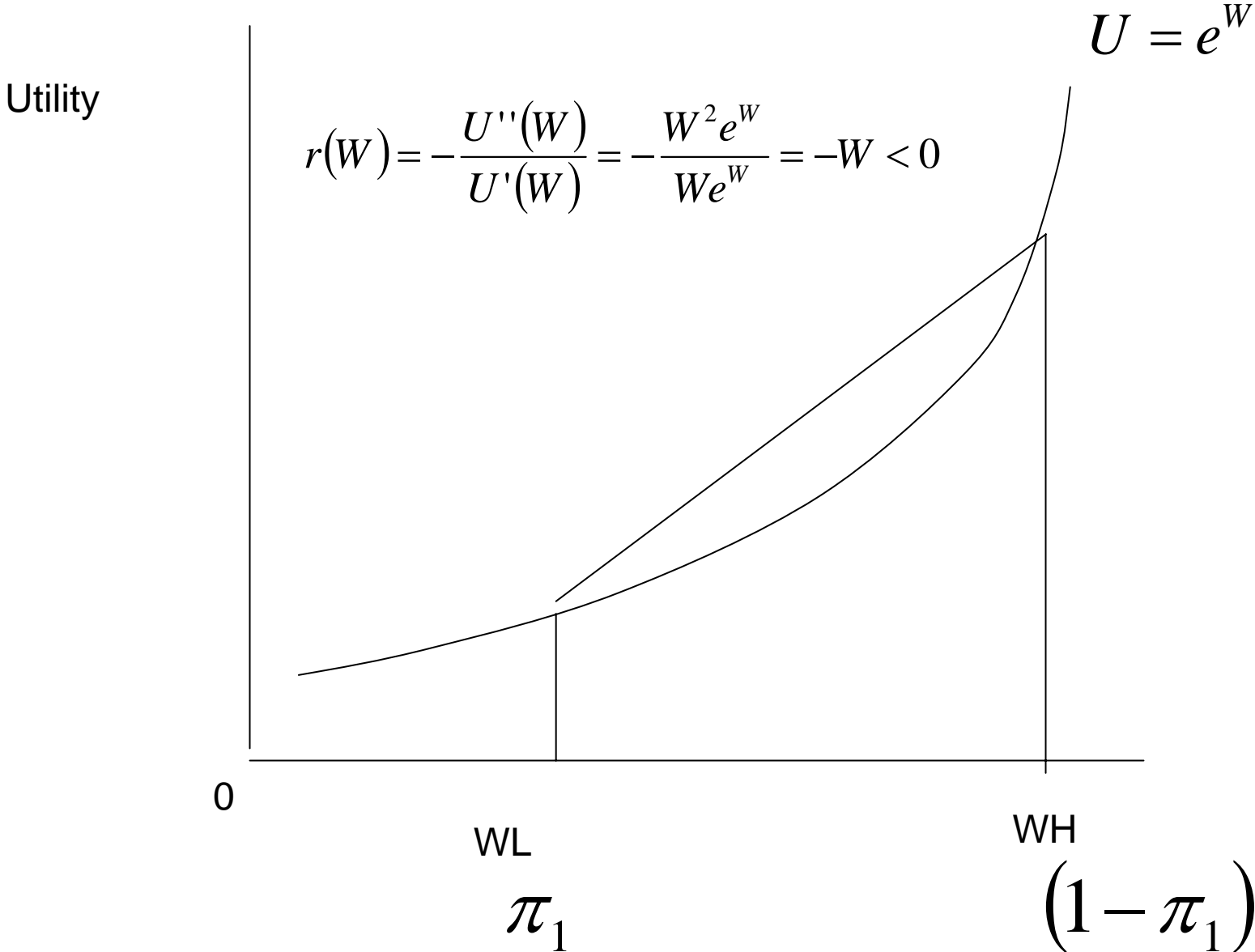
π_1

WH

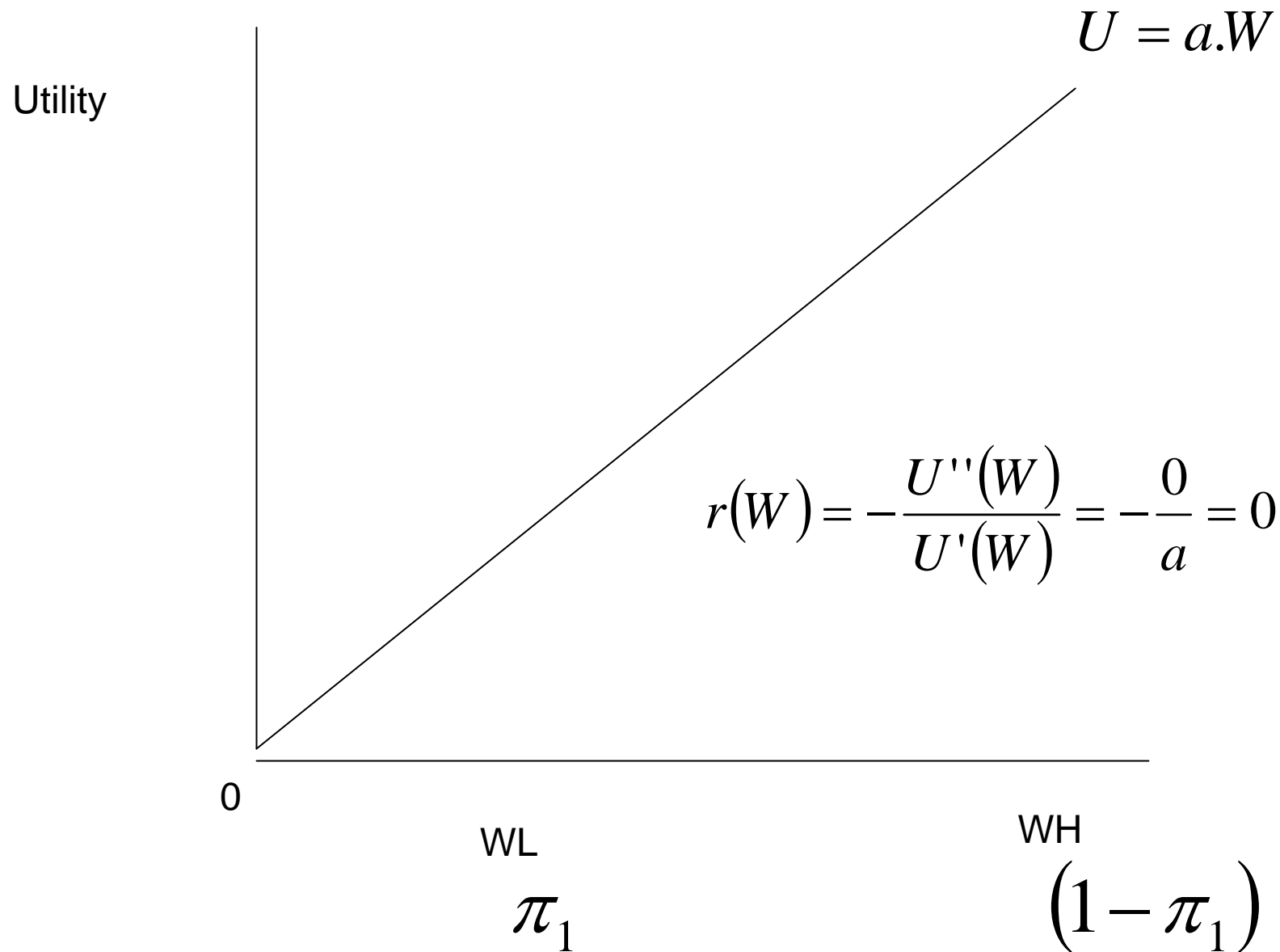
Wealth

$(1 - \pi_1)$

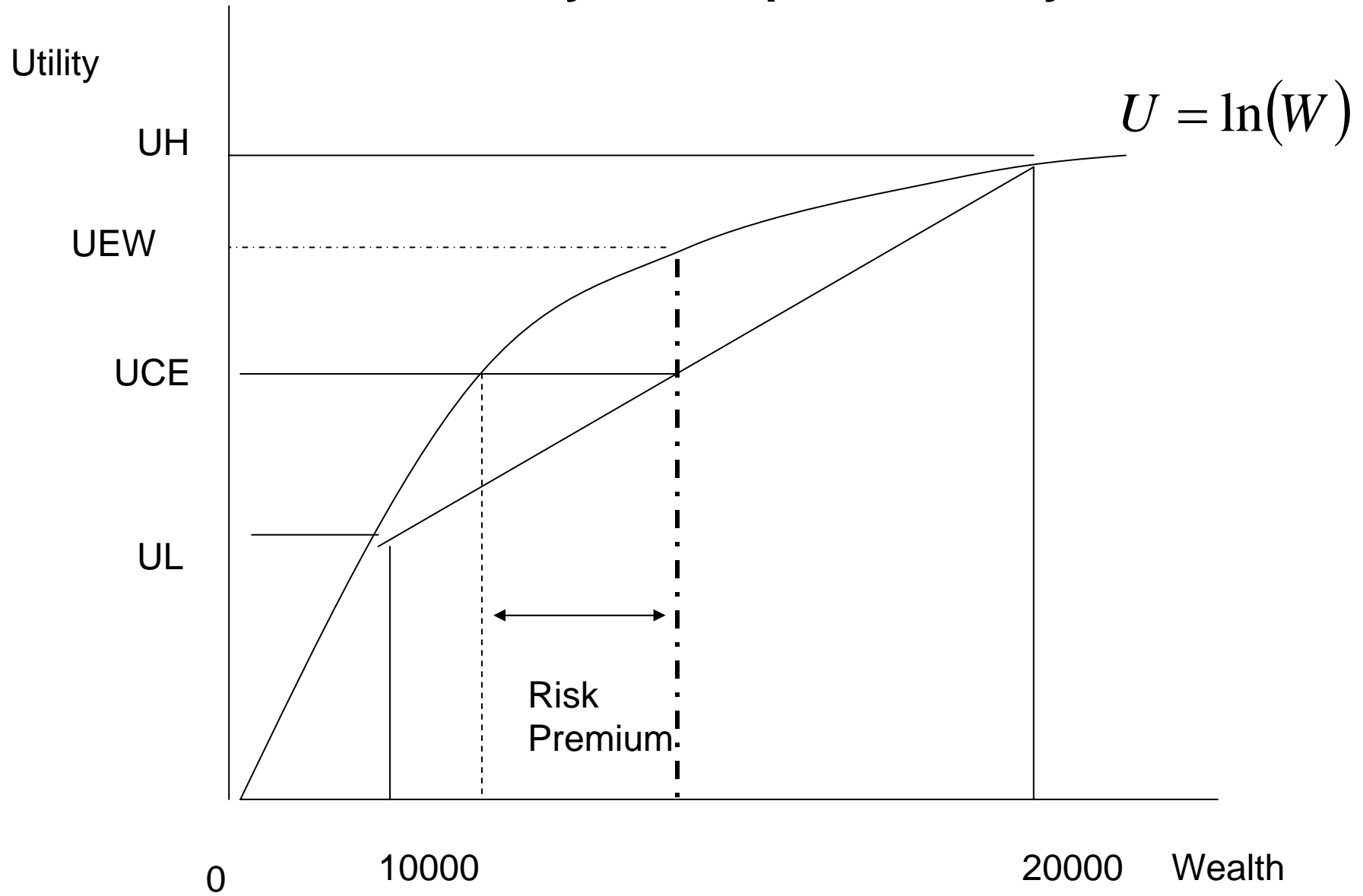
Utility Function for Risk Loving Individual



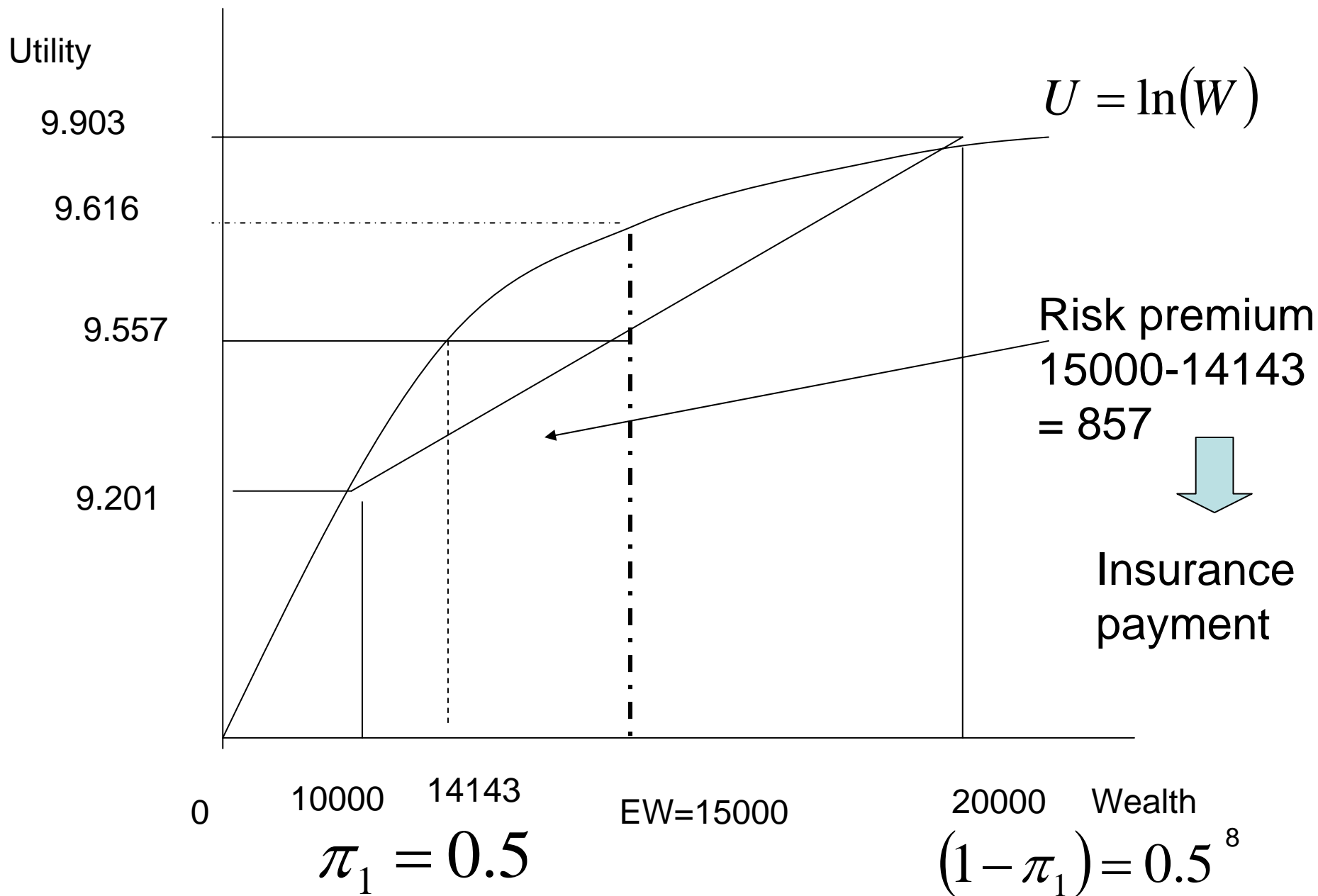
Utility Function for Risk Neutral Individual



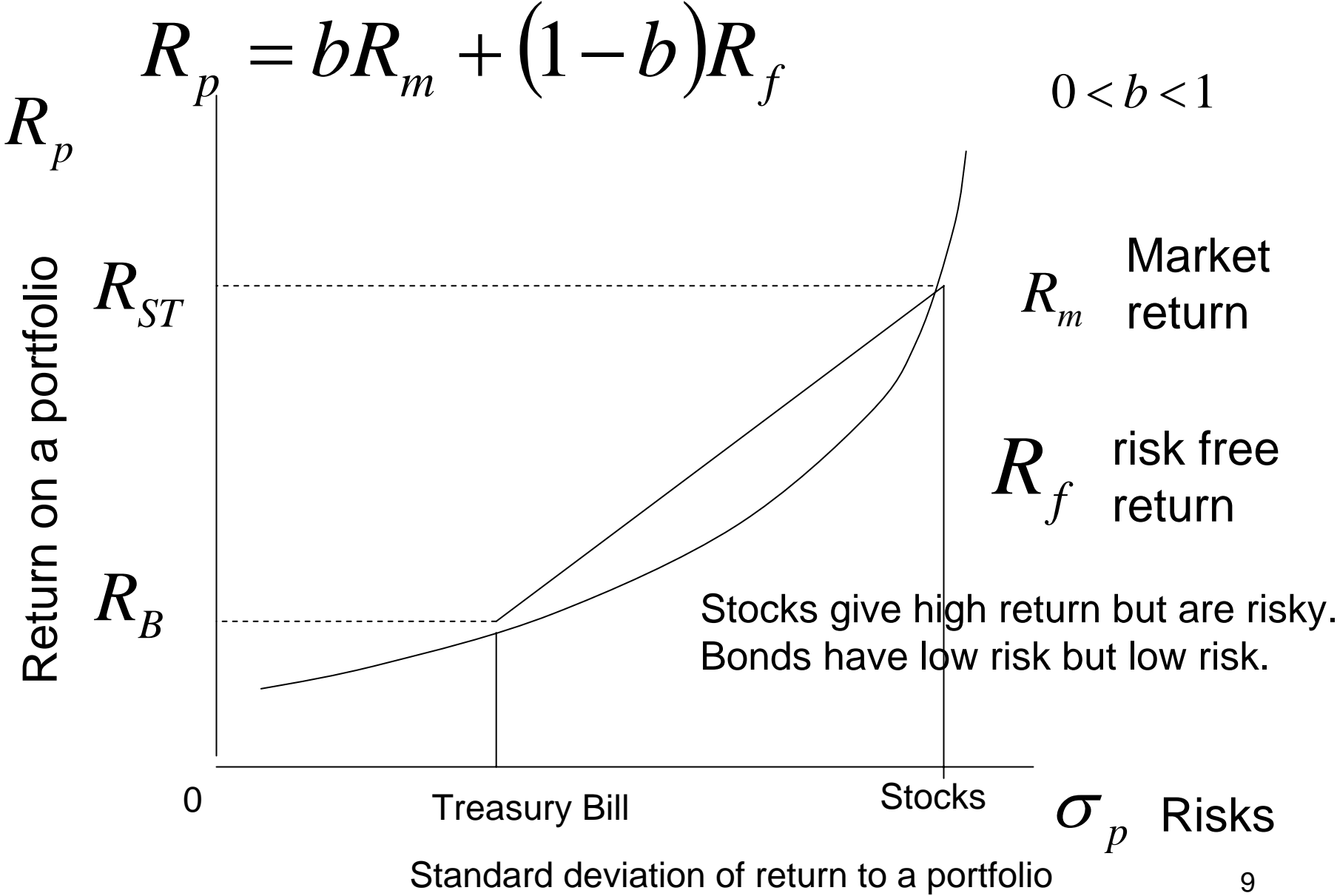
Uncertainty and Expected Utility



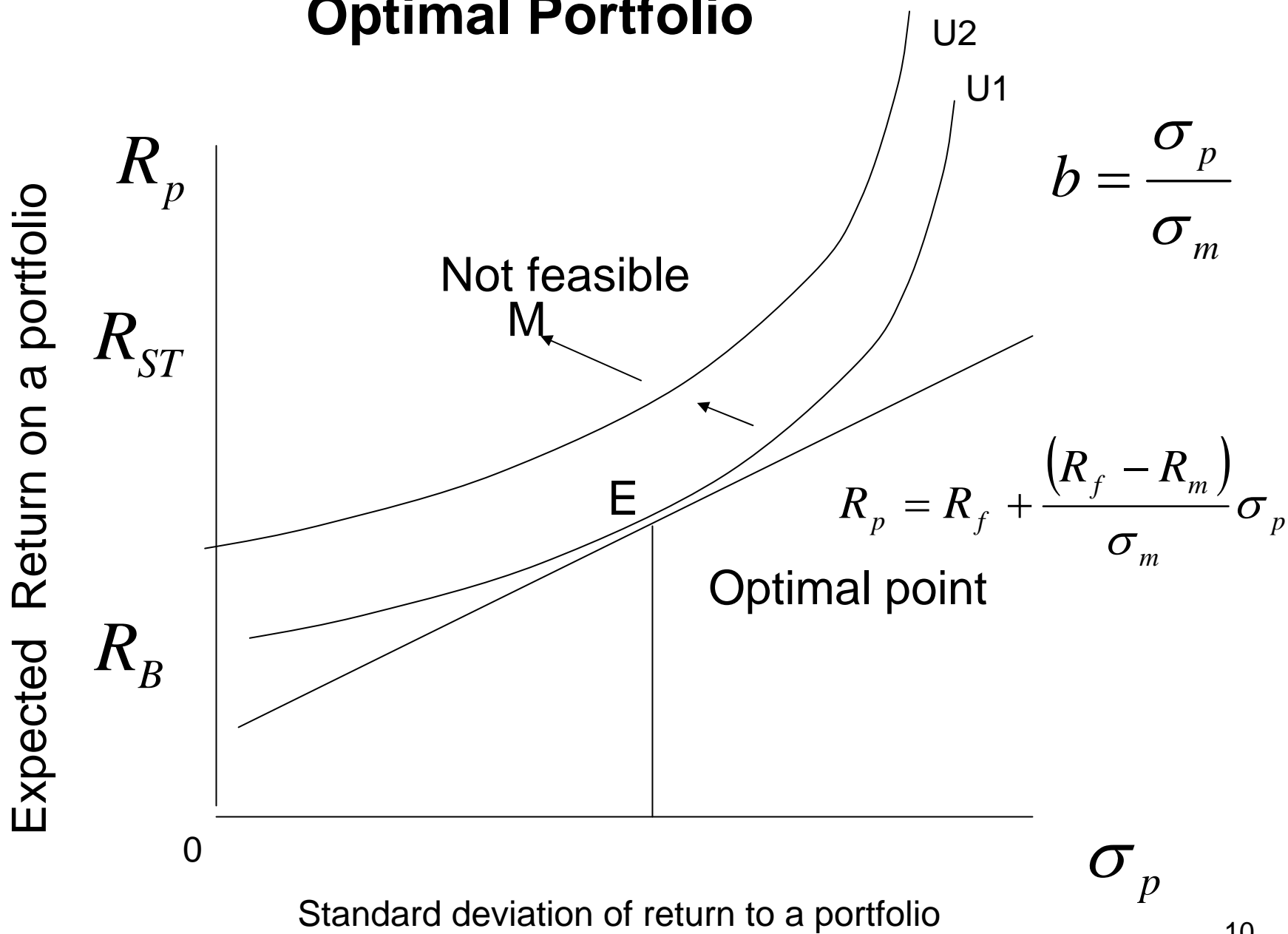
Uncertainty and Expected Utility and Insurance Payment



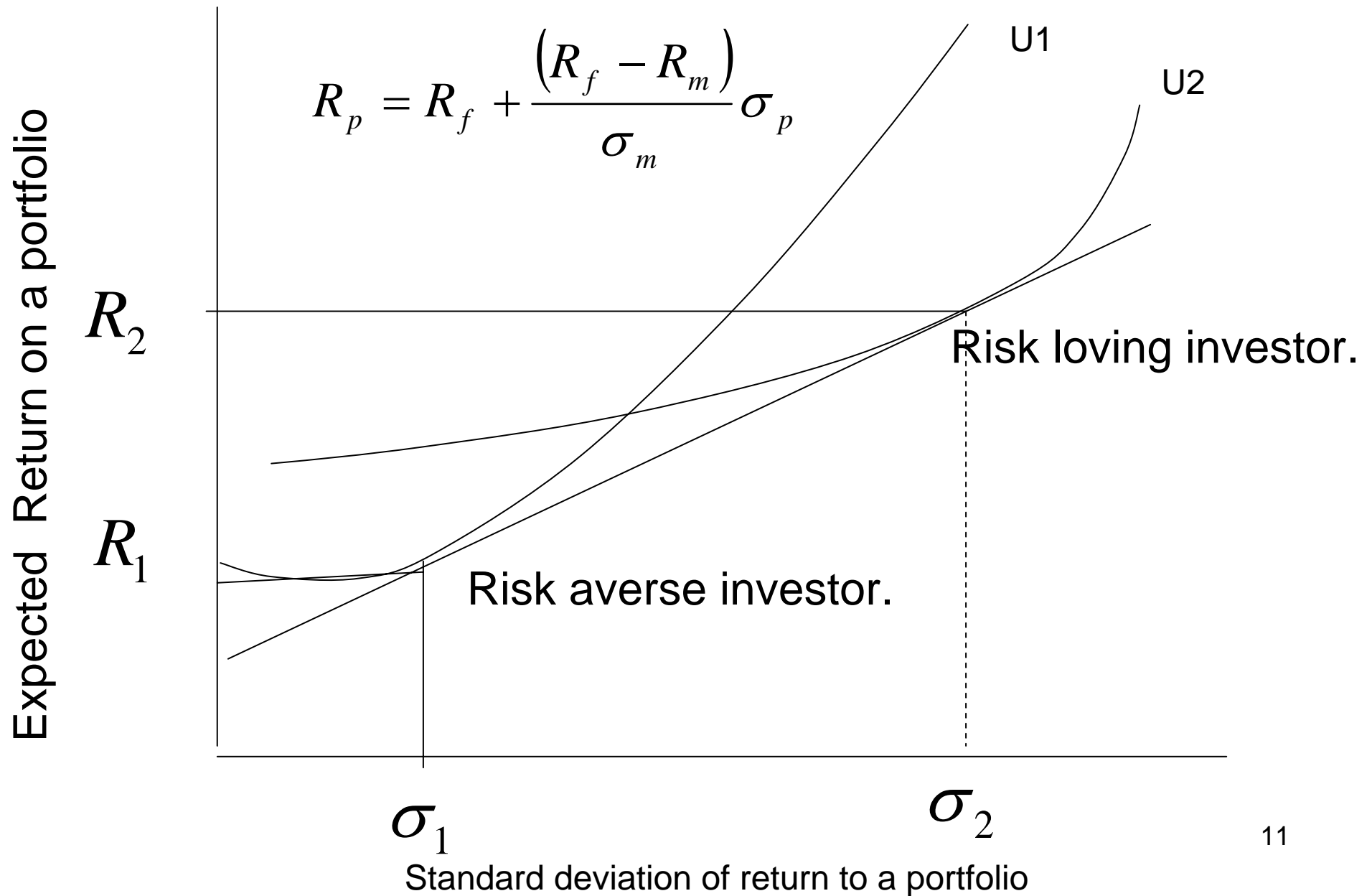
Preference of an Investor Toward Risks Returns



Optimal Portfolio



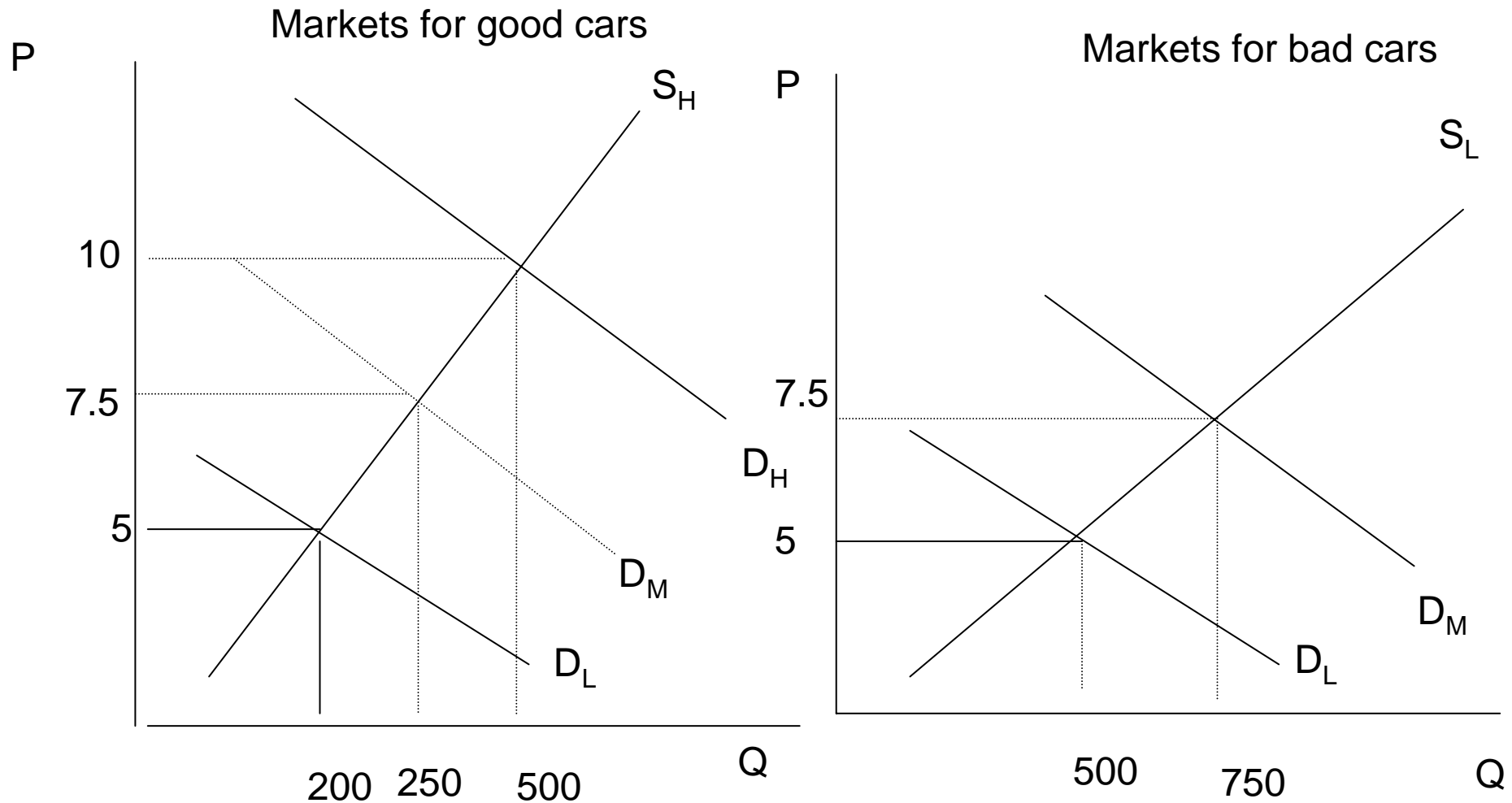
Choices of Risk Averse vs Risk Lover in a Financial Market



Asymmetric information

- Equilibrium is affected when some economic agents have more information than others.
 - Market of used cars
 - Plums: good cars
 - Lemons: bad cars
- Seller knows his quality of cars but buyers does not
- Market for good cars disappear because of existence of bad cars in the market

Akerlof's Model of Asymmetric Information



Sellers know exactly quality of cars but buyers do not.
 Demand for high quality car falls and that for low quality rise, ultimately all
 Low quality cars remain in the market.

Signalling for high quality

- Warranty and Guarantee

Providing warranty less costly for high quality cars

They last long.

warranty is costly for low quality cars as they frequently break down.

- Principal agent problem

Adverse Selection (hidden information) Problem

- Uncertainty about the quality of good
 - low quality items crowd out high quality items;
 - Theft insurance; health insurance;
 - risky vs. gentle borrowers in the financial market.
 - Healthy people are less likely to buy health insurance,
 - people from safe area are less likely to buy theft insurance
 - honest borrowers less likely to borrow at higher interest rates.

Moral hazard (hidden action):

- People who have theft insurance are likely to have easy to break locks in their bicycle (car) and most likely to claim insurances.
- Probability of event is affected by the action of the person
- Remedy: deductible amount; to ensure that some customers take care in security.

Impacts of Asymmetric information

- Equilibrium is inefficient relative to full information
- Government can improve the market by setting high standards
- Signalling: Warranty

Education as a signal of quality of workers:

- Type 1 is less productive than type 2 worker but an employer cannot distinguish off-hand.
- The marginal productivity of type 1 is less than that of type 2, $a_1 < a_2$

Production function $y = a_1 L_1 + a_2 L_2$

Equilibrium in Perfect information World: $w_1 = a_1$ $w_2 = a_2$

World: $w = b w_1 + (1 - b) w_2$

Education as a Signalling Device

- Market is inefficient, it drives out more productive workers.
- If workers can signal their quality by the level of educational attainment, then market may work well.
- Low quality workers may find obtaining certain education costlier than high quality workers,

$$c_1 e^* \geq c_2 e^* \quad c_1 \geq c_2$$
$$\frac{a_2 - a_1}{c_1} < e^* < \frac{a_2 - a_1}{c_2}$$

Education as a Signalling Device

- It is costly for low quality worker to get the specified education.
- It is beneficial for high quality worker to get education.
- so the low quality worker gets no education, but the higher quality worker gets education.
- Employers pay according to the level of education.
- Therefore education works as a signalling device and makes the market efficient.
- Education separates the equilibrium.

$$(a_2 - a_1) < c_1 e^*$$

$$(a_2 - a_1) > c_2 e^*$$

Incentive System: “How can I get someone to do something for me?” :Spence Model

- If a worker puts x amount of effort, the land produces

$$y = f(x)$$

- Then the land owner pays worker $s(y)$.

- The land owner wants to maximise profit

$$\pi = f(x) - s(y) = f(x) - s(f(x))$$

- Worker has cost of putting effort $c(x)$ and has a reservation utility, \bar{u}

- The participation constraint is given by .

$$s(f(x)) - c(x) \geq \bar{u}$$

- Including this constraint, the maximisation problem becomes

$$\text{Max } f(x) - s(f(x))$$

- subject to

$$s(f(x)) - c(x) \geq \bar{u}$$

Incentive compatible contract

(Varian Chapter 36)

- (a) renting the land where the worker pays a fixed rent R to the owner and takes the residual amount of output, at equilibrium $f(x^*) - c(x^*) - R = \bar{u}$
- (b) Take it or leave it contract where the owner gives some amount such as, $B^* - c(x^*) = \bar{u}$
- (c) hourly contract $s(f(x)) = wx + K$
- (d) sharecropping, in which both worker and owner divide the output in a certain way.
- In (a)-(c) burden of risks due to fluctuations in the output falls on the worker but it is shared by both owner and worker in (d).
- Which of these incentives work best depends on the situation.

Readings

- Biswas T.K. (1997) Decision-Making Under Uncertainty, MacMillan.
- Nicholson W (1989) Microeconomics Principles and Extensions, Chapter 9.
- Pindyck and Rubinfeld (2005) Microeconomics, Chapter 5 and 17.
- Varian H (2003) Microeconomics, Chapters 12-13; 36.