Social Insurance:
General Introduction

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DEFINITION

Insurance is payment of premium to get payment in case of adverse event (e.g., auto insurance)

Social insurance programs: Government provided insurance against adverse events funded by taxation:

(a) health insurance (Medicaid, Medicare, Obamacare)

(b) retirement and disability insurance (Social Security),

(c) unemployment insurance

Growth in government over the 20th century is mostly due to the growth of social insurance (health and retirement benefits)

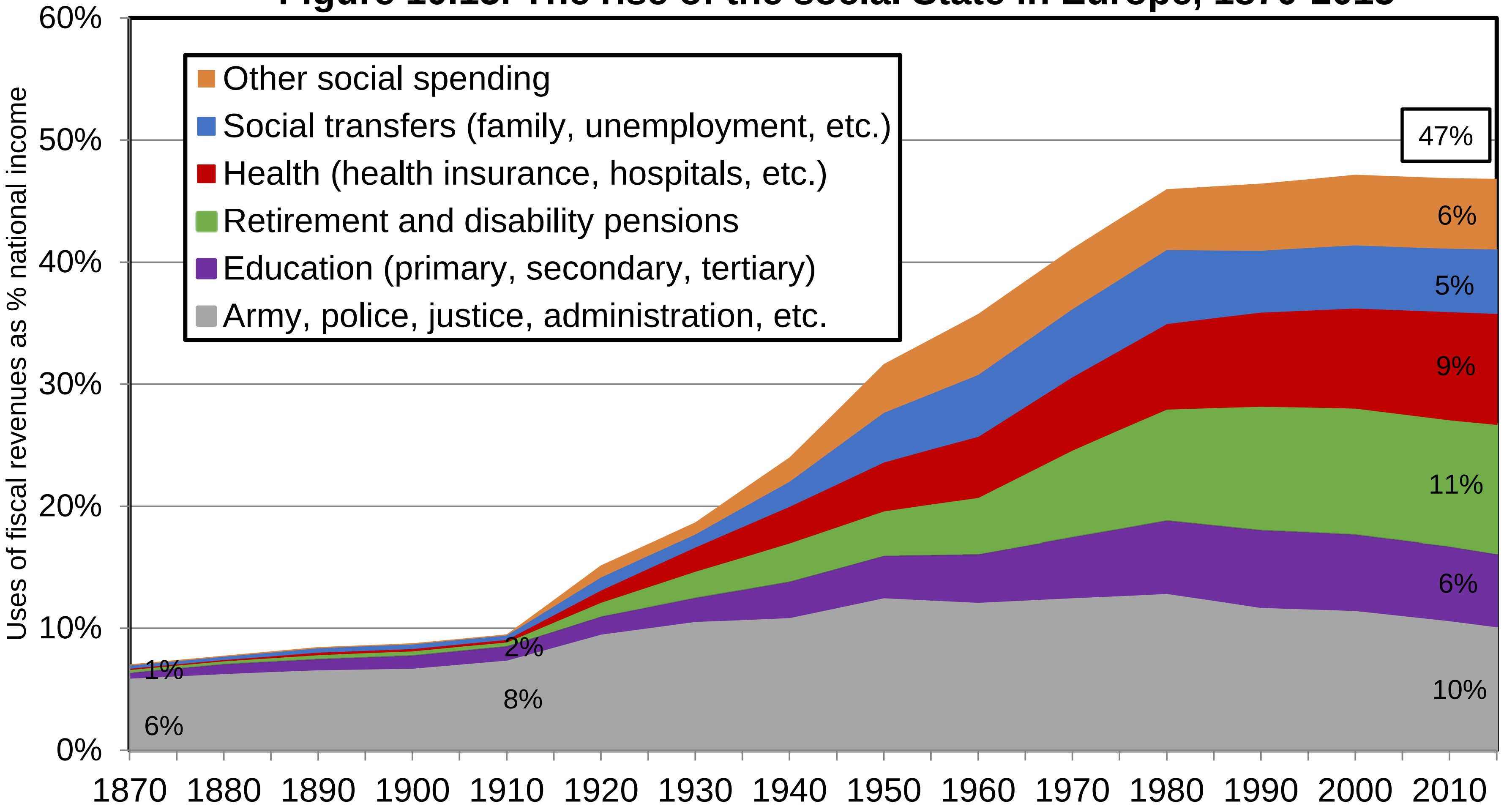


Figure 10.15. The rise of the social State in Europe, 1870-2015

Interpretation. In 2015, fiscal revenues represented 47% of national income on average in Western Europe et were used as follows: 10% of national income for regalian expenditure (army, police, justice, general administration, basic infrastructure: roads, etc.); 6% for education; 11% for pensions; 9% for health; 5% for social transfers (other than pensions); 6% for other social spending (housing, etc.). Before 1914, regalian expenditure absorbed almost all fiscal revenues. **Note.** The evolution depicted here is the average of Germany, France, Britain and Sweden (see figure 10.14). Sources and séries: see piketty.pse.ens.fr/ideology.

EXPECTED UTILITY MODEL

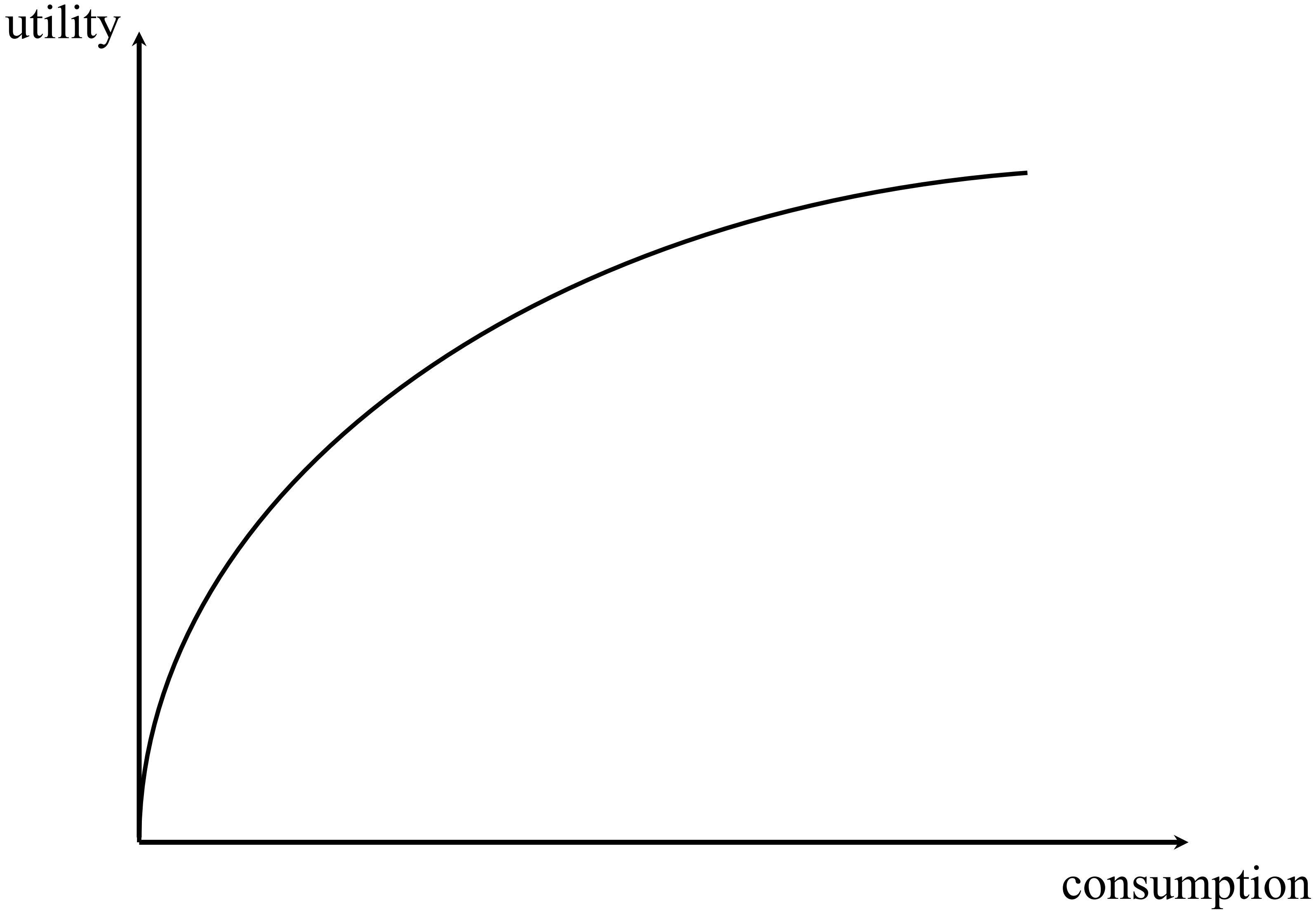
Utility function $U(c)$ increasing in consumption c and concave in consumption c: $U'(c) > 0$ and $U''(c) < 0$

Expected utility model: Individuals want to maximize expected utility defined as the weighted sum of utilities across states of the world, where the weights are the probabilities of each state occurring.

If q is probability of adverse event, expected utility (EU) is:

EU=(1-q) · U(consumption with no adverse event)+
q · U(consumption with adverse event)

Actuarially fair premium: Insurance premium that is set equal to the insurer's expected payout.


utility
consumption

EXPECTED UTILITY MODEL

Person has income W (regardless of health)

Person is sick with probability q

If sick, person incurs medical cost d to get better

Insurance contract: pay premium p always, and receive payout b only if sick

Expected utility:

$$EU = (1 - q) \cdot U(W - p) + q \cdot U(W - p - d + b)$$

Expected profits of insurers: $EP = p - q \cdot b$

Competition among insurers $EP = 0 \Rightarrow b = p/q$

This is called **actuarially fair** insurance

EXPECTED UTILITY MODEL

Individual chooses the level of premiums p to maximize:

$$EU = (1-q) \cdot U(W-p) + q \cdot U(W-d-p+p/q)$$

First order condition:

$0 = dEU/dp = -(1-q)U'(W-p) + q[-1+1/q]U'(W-d-p+p/q)$

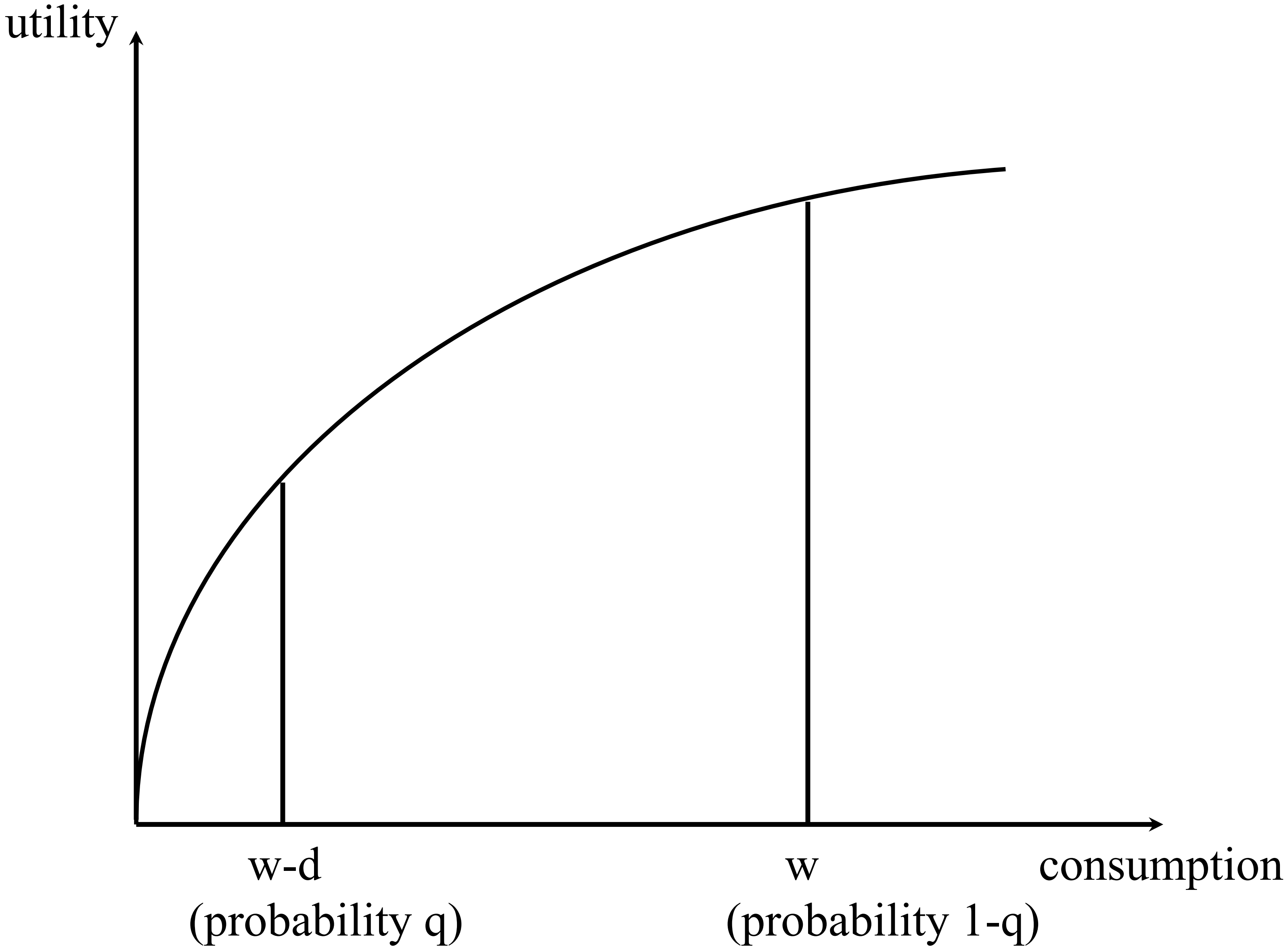
$\Rightarrow U'(W-p) = U'(W-d-p+p/q)$

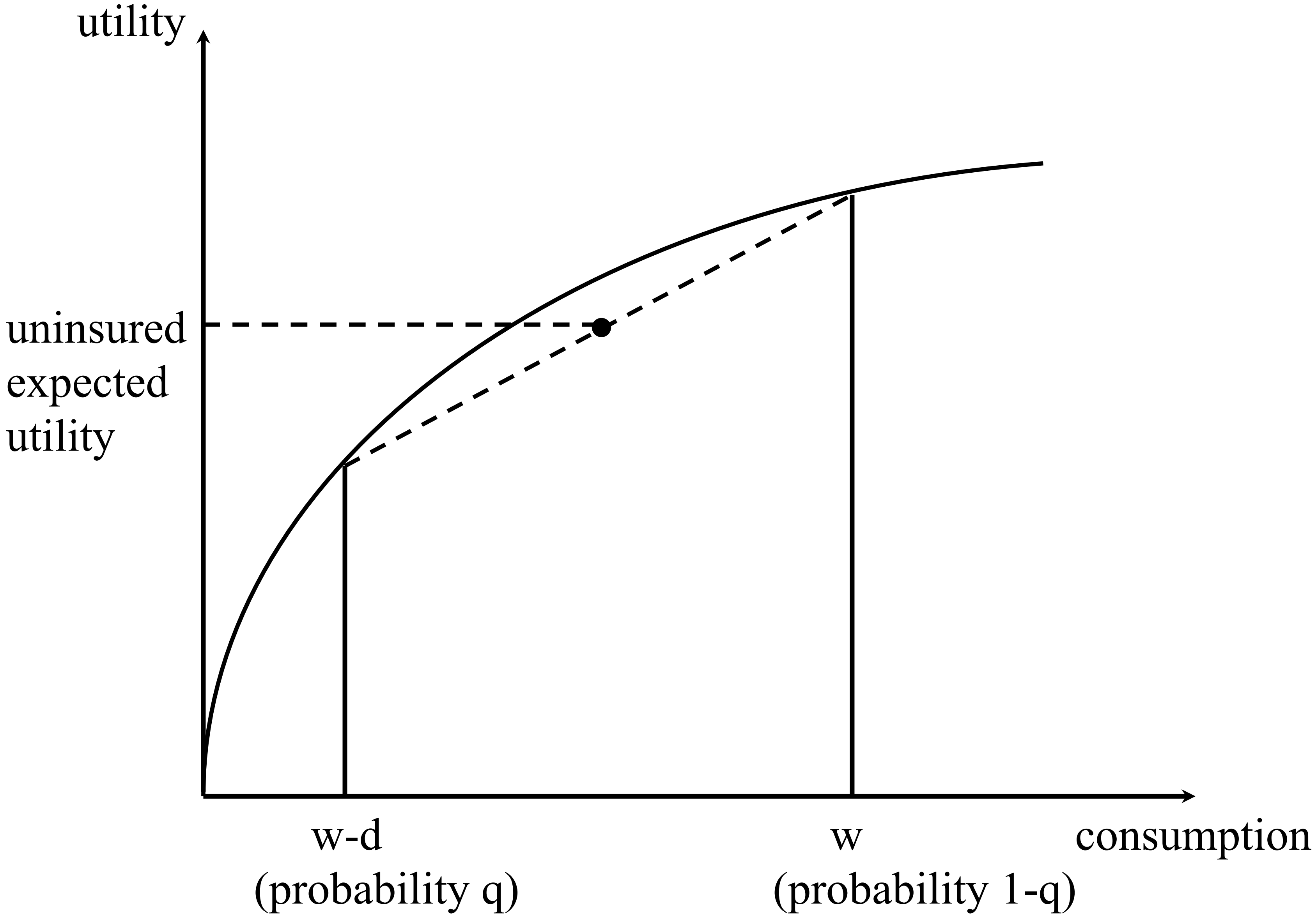
$\Rightarrow W-p = W-d-p+p/q$ (because U is concave and hence U' is strictly decreasing and hence invertible)

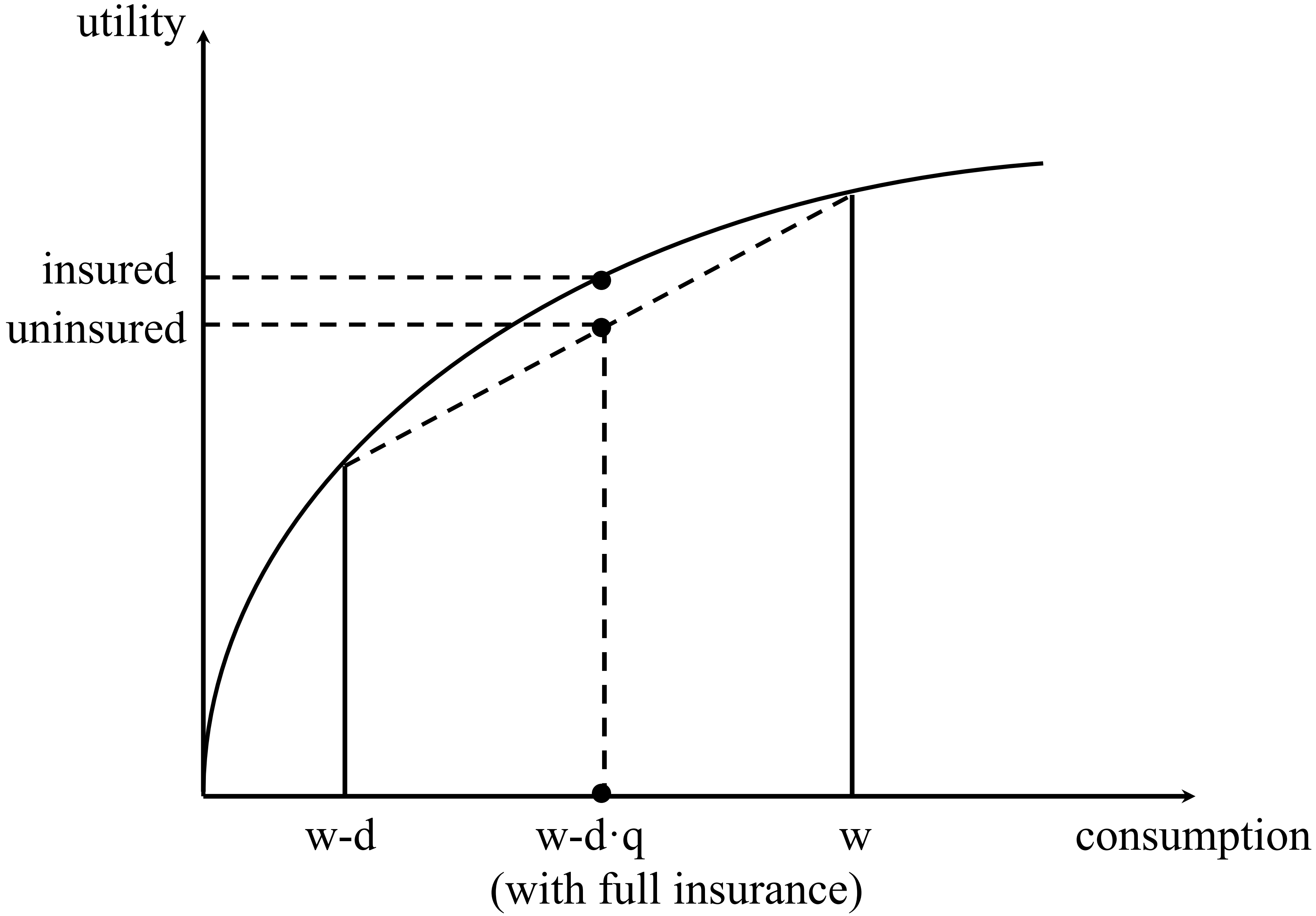
$\Rightarrow 0 = -d + p/q \Rightarrow p = d \cdot q$

This implies that the person is perfectly insured: consumption is the same in both states and equal to $W - d \cdot q$

Intuition: with concave utility, marginal utility decreases and it is always desirable to reduce consumption in high income states to increase consumption in low income states


utility
w-d
(probability q)
w
(probability 1-q)
consumption


utility
uninsured expected utility
w-d
(probability q)
w
(probability 1-q)
consumption


utility
insured
uninsured
w-d
w-d·q
(with full insurance)
w
consumption

Introducing heterogeneity in risk across individuals

Suppose now that there are two types of individuals: sickly and healthy Sickly have $q = q_S$ and Healthy have $q = q_H$ with $q_S > q_H$

First scenario: Symmetric Information: Insurance companies and individuals can observe q_H vs. q_S types (for example, could be age status)

Then insurance companies will charge 2 policies, each actuarially fair:

$p_S, b_S = p_S/q_S$ for the sickly

$p_H, b_H = p_H/q_H$ for the healthy

Each type will still choose to buy perfect insurance $b_S = b_H = d$ and $p_S = q_S \cdot d, p_H = q_H \cdot d$

Sickly always consume $W - q_S \cdot d$

Healthy always consume $W - q_H \cdot d$

Private insurance does not equalize incomes across types only within types

Pre-existing conditions will lead to inequality in insurance premia and welfare but no failure in the insurance market

What if $W - q_S \cdot d < 0$? Sickly person cannot afford insurance and dies (or starves) if sick

Introducing heterogeneity in risk across individuals

Second scenario: Asymmetric Information: Insurance companies cannot observe (or cannot price on) q_H vs. q_S types but individuals do

If insurance companies charge the same two policies as before

$p_S = q_S \cdot d, b_S = d$ for the sickly

$p_H = q_H \cdot d, b_H = d$ for the healthy

Then everybody wants to buy the healthy insurance which is cheaper ⇒ Insurance company will make losses ⇒ cannot be an equilibrium [this is called **Adverse Selection**]

Two equilibrium possibilities:

1) Pooling equilibrium: Insurance companies offer a contract based on average risk [good deal for sickly, mediocre deal for healthy but better than no insurance]

2) Separating equilibrium: Insurance companies offer two contracts: one expensive contract with full insurance for the sickly, one cheap contract with partial insurance for the healthy: each type self-select into its contract ⇒ Outcome not efficient as healthy as under-insured

Adverse Selection

Adverse selection is when individuals know more about their risk level than the insurer and hence individuals with higher risk are more likely to purchase insurance.

Example: people with high risk of getting sick more likely to buy health insurance on Obamacare exchanges than people with low risk of getting sick (as insurers cannot discriminate based on pre-existing conditions)

With adverse selection, market for insurance can unravel in a **death spiral**:

Insurance is offered at average fair price, bad deal for low risk people and hence only high risk people buy it $\Rightarrow$ insurers make losses $\Rightarrow$ insurers raise the price further $\Rightarrow$ only very high risk people buy it $\Rightarrow$ insurers make losses again $\Rightarrow$ no insurance contract is offered at all even though everybody wants full actuarially fair insurance

This inefficiency (market failure) arises because of **asymmetric information**

How Does the Government Address Adverse Selection?

The government can address adverse selection and improve market efficiency but this involves redistribution

Natural solution is to impose a **mandate**: everybody is required to purchase insurance ⇒ If price is the same for everybody, low risk people end up subsidizing high risk people

From a social perspective, being high risk (e.g. having a sickly constitution) is rarely consequence of individual choices ⇒ Society might want to compensate individuals for this

⇒ Explains why all OECD countries (except US) have adopted universal health insurance paid for by government

Obamacare three-legged-stool (a) forbids insurers from charging based on pre-existing conditions, (b) mandates that everybody needs to get insurance, (c) subsidizes health insurance for low income families

In 2019+, mandate (b) weakened by eliminating fine for not having insurance (Obamacare exchanges prices went up but still subsidized at bottom)

WHY SOCIAL INSURANCE: OTHER REASONS

Health Care is a Right: Access to quality health care (regardless of resources) is perceived as **right**. Low income families can't pay for it so need for government funding.

Redistribution: Private insurers cannot provide insurance against pre-existing conditions so those with high risk have to pay more: society may want to compensate high risk people (as being high risk is often not the fault of the person)

$\Rightarrow$ Universal health insurance funded by taxation effectively redistributes from high-risk people to low-risk people

Externalities: Your lack of insurance can be a cause of illness for me, thereby exerting a negative physical externality (flu vaccine example)

WHY SOCIAL INSURANCE: OTHER REASONS

Individual Failures: Individuals may not appropriately insure themselves against risks if the government does not force them to do so (myopia, lack of information, self-control problems)

If individuals understand their own failures, they will support social insurance (e.g., Medicare Health Insurance for elderly is very popular). If individuals really want to be myopic, they will oppose govt social insurance (paternalism)

Administrative Costs: The administrative costs for Medicare are less than 2% of claims paid. Administrative costs for private insurance average about 12% of claims paid.

High administrative costs arise because private insurers try to screen away sickly customers and steal healthy customers from competitors.
Individuals may also not understand well products and hence be sensitive to flashy advertisements.

CONSEQUENCE OF INSURANCE: MORAL HAZARD

Moral hazard: Adverse actions taken by insured individuals in response to insurance against adverse outcomes.

Example: If you receive unemployment benefits replacing lost wages, you may not search as much for a new job ⇒ Insurance reduces incentives to remedy adverse events

Moral Hazard exists with both private and social insurance as long as insurer cannot perfectly monitor the person insured ⇒ Insurers do not offer perfect insurance

The existence of moral hazard problems creates the **central trade-off of social insurance**: insurance is desirable for consumption smoothing but insurance can create moral hazard

[similar to the problem of optimal income taxation equity-efficiency trade-off]

MORAL HAZARD

What Determines Moral Hazard?
-How hard it is to observe whether the adverse event has happened
-How easy it is to change behavior in get into or stay in the adverse event

Moral Hazard Is Multidimensional: In examining the effects of insurance, three types of moral hazard play a particularly important role:
1) Reduced precaution against entering the adverse state (example: auto insurance)
2) Increased odds of staying in the adverse state (example: unemployment insurance)
3) Increased expenditures when in the adverse state (example: health insurance)

$\Rightarrow$ Moral hazard increases the cost of providing insurance

OPTIMAL SOCIAL INSURANCE

Optimal social insurance trades-off two considerations:

1) The benefit of social insurance is the amount of consumption smoothing provided by social insurance programs

2) The cost of social insurance is the moral hazard caused by insuring against adverse events

$\Rightarrow$ Optimal social insurance systems should partially, but not completely, insure individuals against adverse events.

CONCLUSION

Asymmetric information in insurance markets has two important implications:

1) It can cause adverse selection in private insurance provision (as insurers cannot perfectly observe risk types) hence the need for **social** insurance

2) It can cause moral hazard (as insurer cannot perfectly monitor behavior), hence the need to **limit generosity** of insurance

The ironic feature of asymmetric information is, therefore, that it simultaneously motivates and undercuts the rationale for government intervention through social insurance.

REFERENCES

Jonathan Gruber, Public Finance and Public Policy, Fourth Edition, 2019
Worth Publishers, Chapter 12