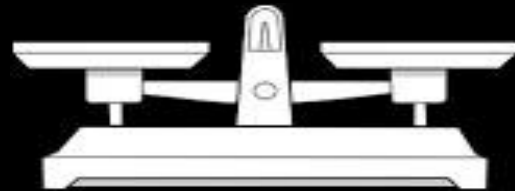# Reflection on Cost Benefit Analysis

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This lecture is about

Part 1:

— Methods of ethics

— CBA grounded in ethical theory

Part 2:

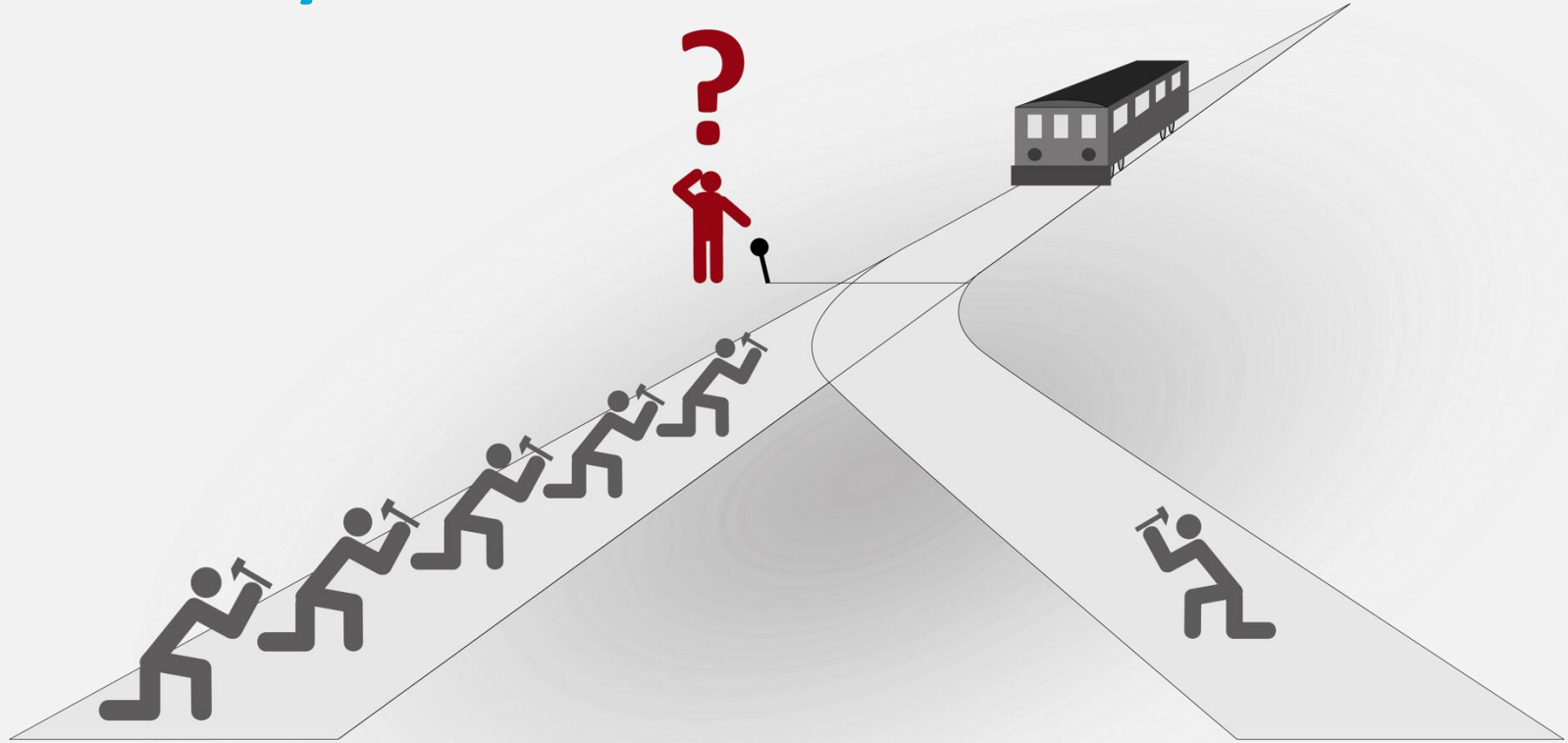— Several (philosophical) problems of CBA

Part 1:
Methods of ethics: basic *math* in ethical reasoning

A thought experiment

The Trolley Problem

Method of Ethics

The method in ethics is *reasoning* and *argumentation*

Three main methods for ethical reasoning (your 'basic math' in ethics)

1) Consequentialism (more specifically) utilitarianism
– Jeremy Bentham (1748–1832)
2) Deontology: rights and duties
– Immanuel Kant (1724-1804)
3) Virtue ethics: virtues and character
– Dates back to Aristotle (384 BC – 322 BC)

Consequentialism

An action is morally right when it creates net positive consequences

It requires that we tally both the good and bad consequences of an action and then determine if the good outweighs the bad

Utilitarianism is a specific type of consequentialism
- an action is morally right if the consequences of that action increase the overall happiness/utility/well-being
- A Cost Benefit Analysis is grounded in utilitarianism

The Trolley Problem: revisited
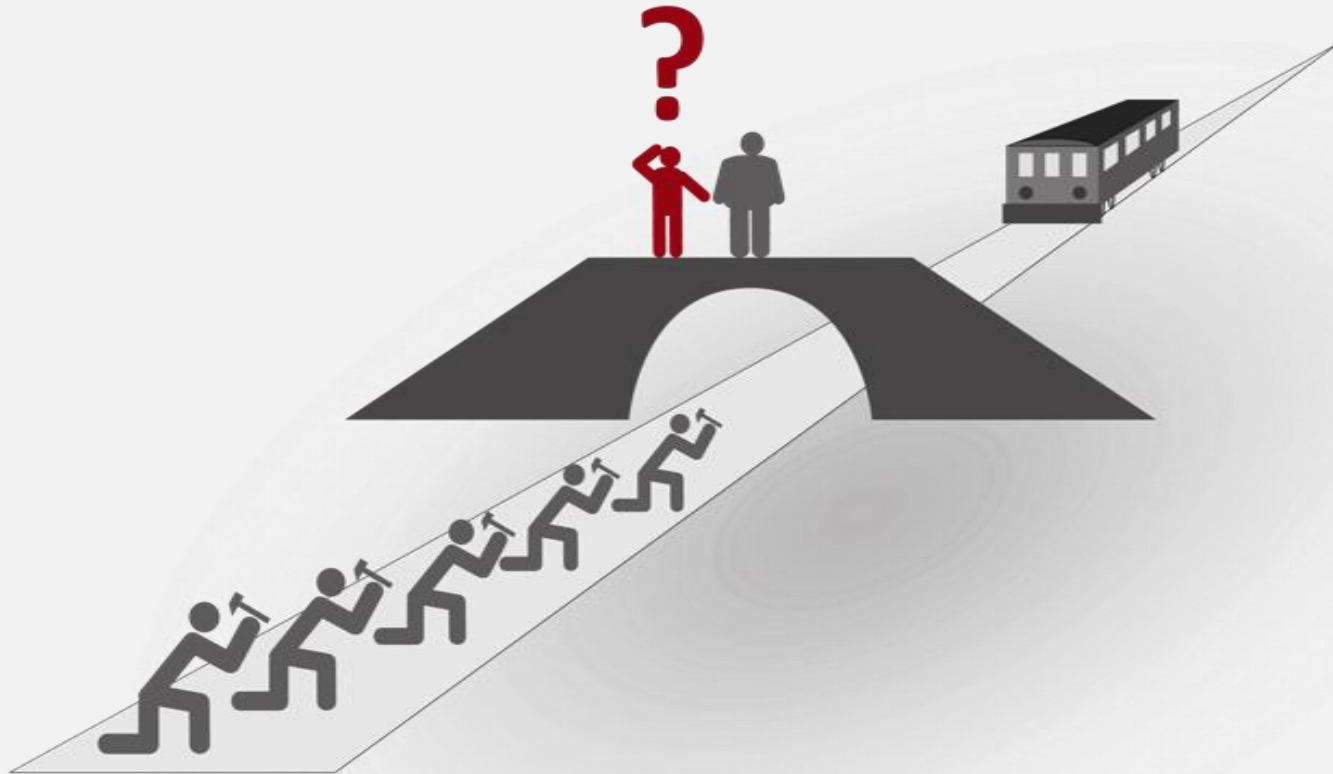
Deontology or duty-based ethics

Some base morality on foundational principle of duty

- That we owe each other

According to Kant, there is a self-evident principle of reason that he calls the "categorical imperative"

- Act only according to that *maxim* by which you can at the same time will that it becomes a universal law

Virtue ethics

Here, the driving force of ethical behavior is the **moral agent**

- – One of the oldest normative traditions in Western philosophy and rooted in ancient Greek civilization

Plato emphasized four virtues

- – Wisdom, prudence, temperance and justice

Aristotle: virtues are good habits which temper our emotions

- – E.g. natural feelings of fear help us develop the virtue of courage

Part 2:

Several philosophical problems of Cost Benefit Analysis

1) Topic selection

For obvious reasons of resource limitations a CBA can't be performed for each decision

CBA is much more common in public than in private sector

- – Business decisions with pollution is not subjected to CBA, while regulatory decisions reducing pollution is

How to include the social and environmental effects in this CBA

2) Choosing perspectives

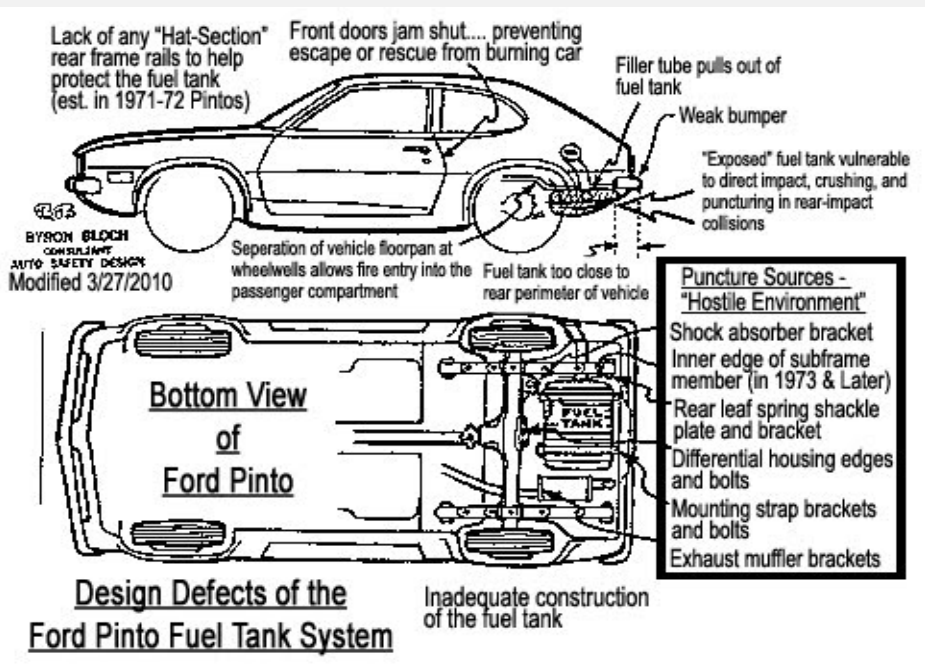Whether we choose the local, regional or national perspective, different conclusions could follow

- For instance about CO_2 reduction

CBA is sometimes used to assess the costs and benefits of a certain regulation or a change in design: e.g. Ford Pinto

- The judge advised the jury that Ford should be convicted of "reckless homicide"
- Fords defense: technical improvement was not "cost-effective"

Ford Pinto

Lack of any "Hat-Section" rear frame rails to help protect the fuel tank (est. in 1971-72 Pintos)

Front doors jam shut.... preventing escape or rescue from burning car

Filler tube pulls out of fuel tank

Weak bumper

"Exposed" fuel tank vulnerable to direct impact, crushing, and puncturing in rear-impact collisions

BYRON BLOCH
CONSULTANT
AUTO SAFETY DESIGN
Modified 3/27/2010

Seperation of vehicle floorpan at wheelwells allows fire entry into the passenger compartment

Fuel tank too close to rear perimeter of vehicle

Bottom View of Ford Pinto

Puncture Sources - "Hostile Environment"
Shock absorber bracket
Inner edge of subframe member (in 1973 & Later)
Rear leaf spring shackle plate and bracket
Differential housing edges and bolts
Mounting strap brackets and bolts
Exhaust muffler brackets

Design Defects of the Ford Pinto Fuel Tank System

Inadequate construction of the fuel tank

Ford's Cost-Benefit Analysis

Benefits	
Savings:	180 burn deaths, 180 serious burn injuries. 2,100 burned vehicles
Unit Cost:	$200,000 per death, $67,000 per injury, $700 per vehicle
Total Benefit:	180 x $200,000 + 180 x $67,000 + 2,100 x $700 = $49.5 million

Costs	
Sales:	11 million cars, 1.5 million light trucks
Unit Cost:	$11 per car, $11 per truck
Total Cost:	11,000,000 x $11 + 1,500,000 x $11 = $ 137 million

Different perspectives are chosen in constructing this CBA

3) Prediction

Social and technical predictions are very difficult
- This hampers forecast oriented technology assessment

This is particularly the case for CBA
- And the consequences far off from the action (both spatial and temporal) depend on complex causal mechanisms
- Especially when there are indirect consequences

4) Moral exclusion

Should we include positive consequences of *immoral* acts?
  – How to assess what is moral? Deontology?

Example: time gain in road construction projects
  – Time gains from exceeding speed limits
  – How should we include this taking into account that
    • speeding could lead to the death of innocent victims

5) Distribution

CBA (and consequentialism in general) is egalitarian
- – Bentham: everybody counts for one and no more than one

While intuitively compelling, some people are *more equal*
- – E.g. those living next the road and exposed to the risks

CBA (and consequentialism) deny distributional effects
- – Some scholars proposed to add the distribution test to CBA

6) Valuation I

The most discussed problem of CBA is **incommensurability**

- – How to assign economic values to what we find invaluable
- – Such as human life, animal species or the environment

Even when we remove money from analysis, how to compare entities such as death, disease and environmental damage

Monetary values could drastically affect the conclusion

- – E.g. Valuation of human life in Ford's CBA in 1971

Human life in Ford's CBA

Component	1971 Costs
Future productivity losses	
Direct	$ 132,000
Indirect	41,300
Medical costs	
Hospital	700
Other	425
Property damage	1,500
Insurance administration	4,700
Legal and court	3,000
Employer losses	1,000
Victim's pain and suffering	10,000
Funeral	900
Assets (lost consumption)	5,000
Miscellaneous	200
Total per fatality	$ 200,725

Human life in EU calculations

EU calculated in 2000 that a measure that will spare one life, 8 serious injuries, 26 light injuries and 200 material damage could spare one million euro as benefits (medical costs, material costs, less productivity etc.)

6) Valuation II

Discounting: calculating costs and benefits over time
- Undisputed and desirable for short-term decision-making
- Controversial in long-term planning

Serious contention about the discount rate of climate change
- One group chooses 1,4% (e.g. Stern Review) or lower, advocating mitigation (CO_2 cuts)
- Another group choose 6% (e.g. Nordhaus) or higher advocating adaptation

In Sum

Part 1:
- There are three important ethical theories
  - Consequentialism, deontology and virtue ethics
- CBA is rooted in utilitarian (consequentialist) thinking

Part 2:
- CBA is one of the most influential methods in policy
  - For its (alleged) straightforward conclusions
- When applying CBA we should be aware of its shortcomings and try to adjust it accordingly

Thank you for your attention!