

# EVALUATING POLICIES I

MPA 612: Economy, Society, and Public Policy

April 8, 2019

*Fill out your reading report  
on Learning Suite*

# PLAN FOR TODAY

---

**What is CBA?**

**Nine simple steps of CBA**

**CBA example**

**WHAT IS CBA?**

My way is to divide half a sheet of paper by a line into two columns; writing over the one Pro and over the other Con.... When I have thus got them altogether in one view, I endeavor to estimate their respective weights; and where I find two, one on each side, that seem equal, I strike them both out.... [T]hus proceeding, I find where the balance lies; and if after a day or two of further consideration... , I come to a determination accordingly.

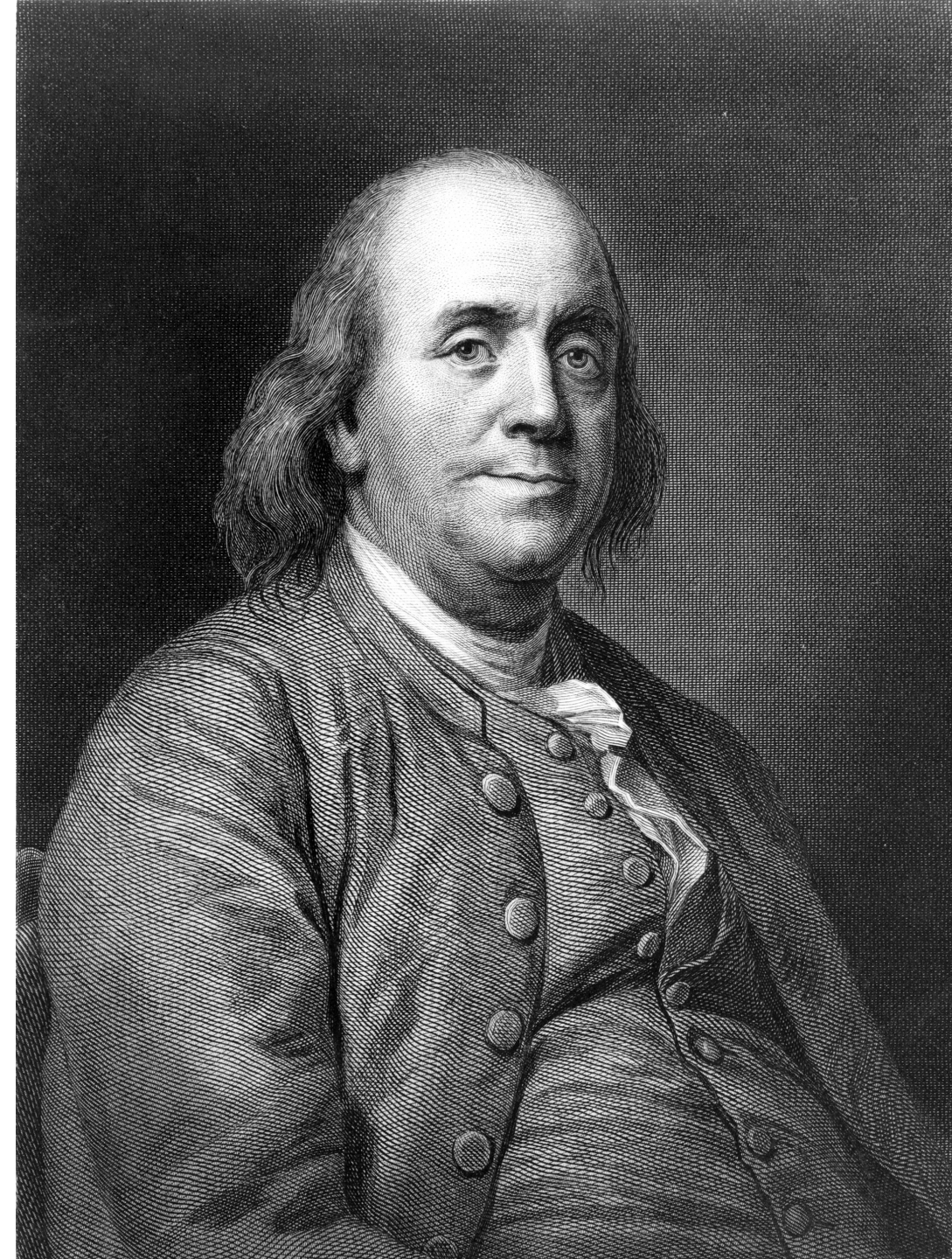
Benjamin Franklin



**At its core, CBA is just  
Franklin's pro/con list,  
but for society**

**Easy logic**

Net social benefit =  
benefits – costs



# CBA IN GOVERNMENT

---

**1936: Army Corps of Engineers**

**1950s–70s: Experimentation**

**1981: Reagan's EO 12291 and RIA**

**1994: Clinton's EO 12866**

# TYPES OF CBA

---

*ex ante*

*in medias res*

*ex post*

# WHO USES CBA?

---

**Executive agencies**

**Legislators**

**Courts**

**Cities and states**

**Nonprofits and foundations**

**Aid agencies**



**CBA is deceptively hard  
and complicated and  
expensive in real life**

...

There are benefits, of course, which may be countable, but which  
Have a tendency to fall into the pockets of the rich.  
While the costs are apt to fall upon the shoulders of the poor.  
So cost-benefit analysis is nearly always sure.  
To justify the building of a solid concrete fact,  
While the Ecologic Truth is left behind in the Abstract.

Kenneth E. Boulding, "A Ballad of Ecological Awareness" (1973)

# NINE SIMPLE STEPS OF CBA

lolz

# 1. Specify the set of alternative projects

List all the possible alternatives

Keep status quo if still viable

Asphalt or concrete

4 different routes

2, 3, 4, or 6 lanes

No tolls, low tolls, high tolls

Elk tunnels?

Begin construction now or later

## 2. Decide whose benefits and costs count

Standing

Just citizens of city/state/country?

Just people currently alive?

### 3. Identify impacts and measure them

Impacts = inputs and outputs

Think of every possible thing involved

You live in a city that currently does not require bicycle riders to wear helmets. You like riding your bicycle without a helmet.

From your perspective and society's perspective, what are the major costs and benefits of a proposed city ordinance that would require all riders to wear helmets?

How might you measure these?



## **4. Predict the impacts quantitatively over the life of the project**

Make predictions for each of the impacts from step 3

Figure out number of vehicle trips on new highway + old roads

Extrapolate and estimate driving costs saved, accidents avoided, lives saved, etc.

## 5. Monetize all impacts

Put everything in the same scale: \$\$\$

Market prices

Shadow prices

# Statistical life $\neq$ individual life

What did Colbert claim? What was wrong?

## Value of a statistical life

How much people are willing to pay for a reduction in the probability of death, extrapolated to 100%

Like a demand curve for injury and death

# Contingent evaluation

Ask people what they'd be willing to pay to lower their risk of death

Surveys, focus groups, guesses

# Revealed preferences

Look at what people pay in real life

Low risk jobs pay less than high risk jobs,  
so higher wage = WTP for reduction in risk

# Contingent evaluation vs. revealed preferences

We tend to trust people's own revealed  
safety vs. money preferences

But, it's tricky

OCTOBER 2013

## Using data from the Census of Fatal Occupational Injuries to estimate the “value of a statistical life”

*The advent of the Census of Fatal Occupational Injuries has enabled researchers to reduce measurement error in fatality rate estimates; in turn, estimates of the “value of a statistical life” that are based on labor market data have become less uncertain.*



**Table 1. Fatality rates, by industry and occupation, 2006–2008**

Occupation	Industry										
	Total	Construction	Finance, insurance, and real estate	Information	Manufacturing	Mining	Public administration	Retail trade	Services	Transportation and public utilities	Wholesale trade
Management, business, and financial	1.2	3.8	0.8	0.6	0.7	3.2	0.9	0.7	1.1	1.3	1.5
Professional and related	.9	3.5	.2	1.1	.7	7.2	1.2	.7	.8	1.5	1.3
Service	3.2	16.2	2.8	2.0	1.9	(1)	9.1	2.1	2.4	2.9	(1)
Sales	1.9	1.9	1.1	2.1	1.7	(1)	(1)	2.3	1.1	1.0	2.1
Office and administrative support	.5	.6	.3	.4	.4	(1)	.3	.6	.4	1.4	.5
Farming, fishing, and forestry	8.3	(1)	(1)	(1)	6.7	(1)	10.3	8.6	19.4	15.5	4.6
Construction and extraction	12	11.8	4.8	(1)	6.6	34.9	5.0	3.1	12.4	8.4	8.4
Installation, maintenance, and repair	6.9	13.8	6.2	3.6	6.0	16.5	1.9	3.0	6.2	8.9	11.7
Production	2.8	14.1	3.2	2.0	2.4	16.1	2.8	1.1	2.8	4.1	7.0
Transportation and material moving	15.8	21.6	15.3	28.2	7.9	25.4	13.9	5.7	14.1	22.4	11.4
Industry average	...	10.2	1.0	1.7	2.4	20.7	3.9	2.1	1.8	11.5	4.0

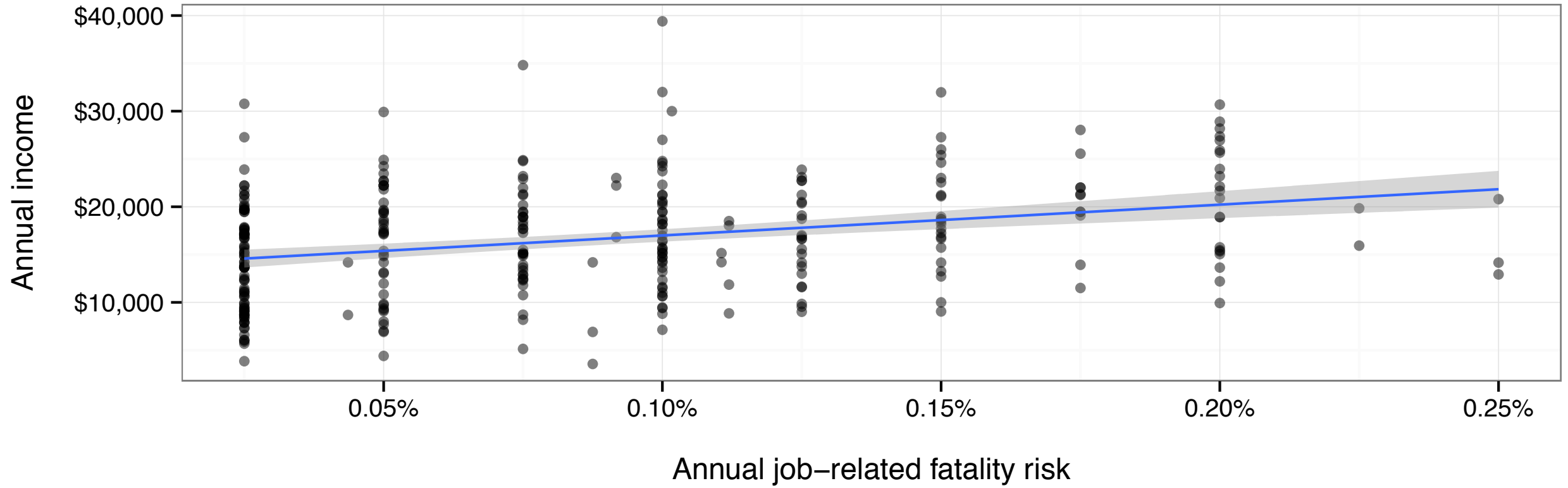


Table 3. Regression estimates of the value of a statistical life

Category	Wage equation, based on—		Logarithm of wage equation, based on—	
	Hours-based fatality rates	Employment-based fatality rates	Hours-based fatality rates	Employment-based fatality rates
Fatality rate	0.0395 (0.0078)	0.0437 (0.0067)	0.0024 (0.0003)	0.0026 (0.0003)
Value of a statistical life (in millions of dollars)	7.9	8.7	9.9	11.1
Adjusted R-squared	.3884	.3885	.4405	.4407

Note: Standard errors are in parentheses following the estimate. All coefficients are statistically significant at the 99-percent level or better. Endnote 5 in the text gives other variables included in the equation. The sample size is 126,225.

Source: Author’s calculations, based on U.S. Bureau of Labor Statistics, Current Population Survey.

potential work experience + potential work experience squared + years of education + indicator variables for male, married, Black, Native American, Asian, Hispanic ethnicity, doctorate or professional degree earned, paid hourly rate, full-time employment, union or employee association membership, government employment, six metropolitan and nonmetropolitan areas, eight regional areas, nine largely blue-collar occupations, and professional occupational group

Coefficient ×  
100,000 ×  
average hours  
worked per year

$0.0395 \times 100,000 \times (42.57 \times 52) =$   
\$8.74 million

Off because of rounding

Others, like NHTSA



## AN ECONOMIC ANALYSIS OF A DRUG-SELLING GANG'S FINANCES\*

STEVEN D. LEVITT AND SUDHIR ALLADI VENKATESH

**VSL = \$50,000**

## 6. Discount benefits and costs to obtain present values

Present value = value of an amount that occurs in the future

$$PV = \frac{FV}{(1 + r)^t}$$

# Why discount?

Costs of public projects  
are front loaded

Benefits occur over a  
long period of time

How do we know if the benefits  
over time are worth the initial costs?

# Discount rates

Opportunity costs

Time value of money

OMB Circular A-94 Appendix C

1%, 3%, 7%, then sensitivity analysis

World Bank uses 10%



## 7. Compute the net present value of each project

$$PV = \frac{FV}{(1 + r)^t}$$

$$TPV = \sum_{t=0}^n \frac{X_t}{(1 + r)^t}$$

$$NPV = TPV(\text{benefits}) - TPV(\text{costs})$$

## 8. Perform sensitivity analysis

Manipulate or simulate everything that is uncertain or contentious

Impacts

Discount rate

VSL

Monetizations

## 9. Make a recommendation

If  $NPV > 0$ , 

# Important CBA numbers

**Benefit cost ratio (BCR):**  
Total benefits / Total cost

**Internal rate of return (IRR):**  
Breakeven discount rate

★ **Net present value (NPV):** ★  
Benefits – costs

# Should we do a project if $NPV < 0$ ?

Sometimes, yeah, if we're comfortable with DWL or outcome

Sin taxes; Pigovian taxes; subsidies

Justify the policy on other grounds

# Standards of fairness/efficiency

## Pareto standard

Nobody made better off without someone being made worse off

## Kaldor-Hicks standard

Potential Pareto

Adopt policy iff those who gain could compensate those who lose and still be better off

Compensation doesn't have to happen; benefits could all go to one person

# CBA EXAMPLE