

# Thoughts on Teaching Benefit-Cost Analysis- Things that have worked

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Teaching Roundtable Session  
Society of Benefit-Cost Analysis Meetings  
held March 17-18, 2016 in Washington, DC

# Student Type & Course Type

- Teaching BCA for 20+ years at UK
- Mostly Public Policy & Public Administration
  - also Ag Econ, Econ, Bus & Acct., Pol Science, Geography, Engineering students
- Mostly Master's, but also PhD students
- Evaluation:
  - Homework (15%)
  - Exams: 2 exams with 5 pages notes (50%)
  - Participation/Presentations (10%)
  - BCA Critique: in lieu of final exam *JBCA* & *JPAM* articles, Individual or mixed groups, (25%)**

# Misconceptions - Slay Dragons Early

1. **All government spending has positive net benefits; creates jobs & stimulates the economy!**
2. Only Republicans support BCA!
3. BCA is unethical!
4. Behavior doesn't matter!

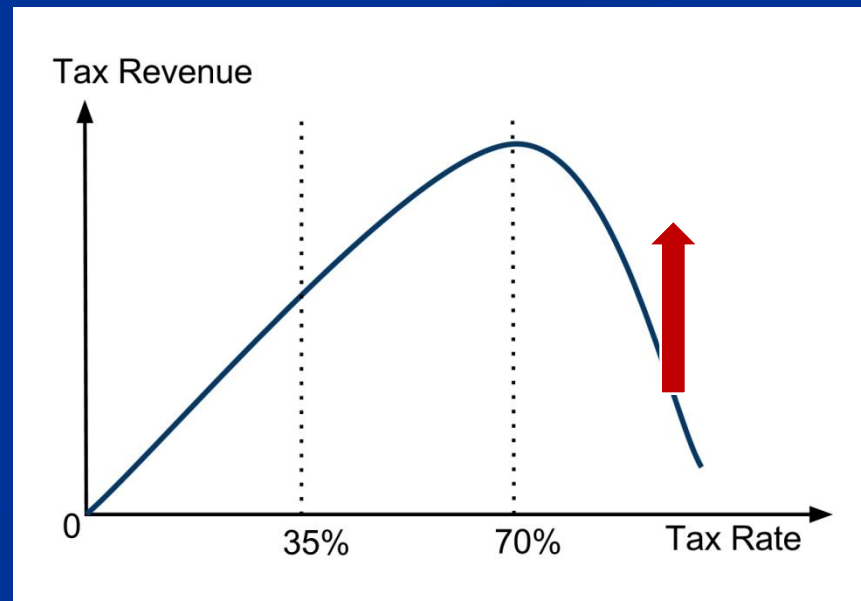
# Laffer Curve: Tax Rate & Tax Revenue

Tax revenue = (tax rate)(tax base)

Revenue is a constant proportion of base if the base does not change.

But, base usually shrinks when rate rises.

*“Voodoo supply side”*: reduce rate, base expands so much that revenue increases!



# “Voodoo Multipliers”

Barro *Economists' Voice* (2009)

- **1.5?** gov't purchase +1 → real GDP +1.5  
gov't better than private market
- **1.0?** gov't purchase +1 → real GDP +1  
no cost in private consumption of investment  
“free” because “unemployed” L & K
- **0.0?** gov't purchase +1 → real GDP +0  
Private consumption, investment, net exports ↓  
Crowd out offsets public purchases (-?)

Whatever the value of the multiplier, do BCA!

# Interstates to Nowhere I-66 & I-69

*Lexington Herald-Leader, February 3, 2013*

<http://www.kentucky.com/2013/02/02/2500783/after-millions-of-dollars-i-66.html#storylink=misearch>



# Interstates Create Jobs?

Chandra & Thompson *RSUE* (2000)

- US Interstate highway construction 1969-1993
- Non-metro counties; avoids endogeneity of building where there is growth
- **Highway counties**: +6-8% earnings over 24 years mostly service & retail industries
- **Adjacent counties**: **negative** 1-3%, retail fell 8-11%
- **Overall**, all counties, net effect  $\approx$  **ZERO**



# Job Creation & Employment Efficiency

- Bartik. Upjohn (2011): 80% of employment increases in one state due to incentives are offset by employment decreases in other states
- Bartik, *ARRE* (2012): Involuntary unemployment when unemployment rate is *high*;  
Efficiency gain = Wage paid – reservation wage – costs to employers  
Lasting effects of *local* demand shocks
- *JBCA* (2015)  
Haveman & Weimer  
Belova, Gray, Linn, Morgenstern, and Pizer



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# Executive Orders – 40 Years

- EO 11821 Ford: inflationary impact statement, COWPS, WIN
- EO 12044 Carter: CEA, COWPS & RARG
- EO 12291 Reagan: BCA & OMB
- EO 12866 Clinton: justice & kids added
- EO 13563 Obama: affirm, +retro ex post

Efficiency appeals to many, waste is worrisome

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# Ethical Basis for Benefit-Cost Analysis

**BCA:** **Teleological** systematic, formal procedure for measurement of the net economic benefit of any change in resource allocation using specific techniques derived from economic theory

# Ethics Reference

Brandt-Rauf, Sherry I. and Paul W. Brandt-Rauf.  
“Occupational Health Ethics: OSHA and the  
Courts” *Journal of Health Politics, Policy, and  
Law* 5 (Fall 1980): 523-534.



***“Hey, we all need some help from time to time!”***

Happy National Public Health Week!

# Teleology

- Ethics of ends & **consequences**
- Compare **alternatives**, choose action likely to generate the **greatest good**
- Bentham and Mill as ethical universalists
- **Utilitarians: greatest good for the greatest number**

# Implications of Teleology

- Circumstances & consequences matter
- Can consider any tradeoff, everything has a price
- Relies on social norms and laws to set boundaries (deontology with obligate moral rules?)
- **BCA** is teleological
  - Max social net benefits is morally good



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# Nonmarket/Government Failure

## ➤ **Visible hand** > Invisible hand?

Wolf *JL&E* (1979)

## ➤ **Implementation Analysis**

Who will run the program?

Incentives & resources for/against?

Unintended consequences?

Experience?

# Unintended Consequences

Kristof, Nicolas. “[Profiting from a Child’s Illiteracy](#)” *New York Times* (December 7, 2012) [video](#)

“parents here in Appalachian ... pulling their children out of literacy classes. Moms and dads fear that if kids learn to read, they are less likely to qualify for a monthly check for having an intellectual disability...

Many people in hillside mobile homes here are poor and desperate, and a **\$698 monthly check per child** from the Supplemental Security Income program goes a long way — and those checks continue until the child turns 18...”



2011 IIHS

TOP SAFETY PICK



Every FIAT® 500 created after July 2011 received a top rating based on front and side crash tests, a roof strength test, a rear-impact test, and the availability of Electronic Stability Control. Conducted by IIHS. Remember, although it was built to be safe, do not jump gators or attempt any other maneuver outside of the normal realm of driving, duh.

New 2012  
FIAT 500

\$199 Per Month

Prices Starting at

\$14,995

- 30 Mpg city
- 38 Mpg hwy





# Behavioral Economics: New Market Failures

Madrian *AnRevEcon* (2014)

Consumers' and producers' *cognitive limitations* and *psychological* biases cause market inefficiencies (failure to reach Pareto Optimality)

1. **Imperfect optimization** due to limited attention and competence – oversimplify, heuristics.
2. **Bounded self control** – intentions don't match behavior; procrastinate
3. **Context dependence** – status quo bias, framing matters, starting point matters

# Behavioral Economics: Implications for Policy

Most controversial:

**Substitute a paternalistic approach**

for the positive (consumer and producer) model placing an analyst, expert, or policymaker in the position of deciding which preferences are rational and welfare-enhancing and which are not.

**DEPARTMENT OF ENERGY**

**10 CFR Part 431**

[Docket Number EERE-2010-BT-STD-0003]

RIN 1904-AC19

**Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment**

**AGENCY:** Office of Energy Efficiency and Renewable Energy, Department of Energy.

**ACTION:** Final rule.

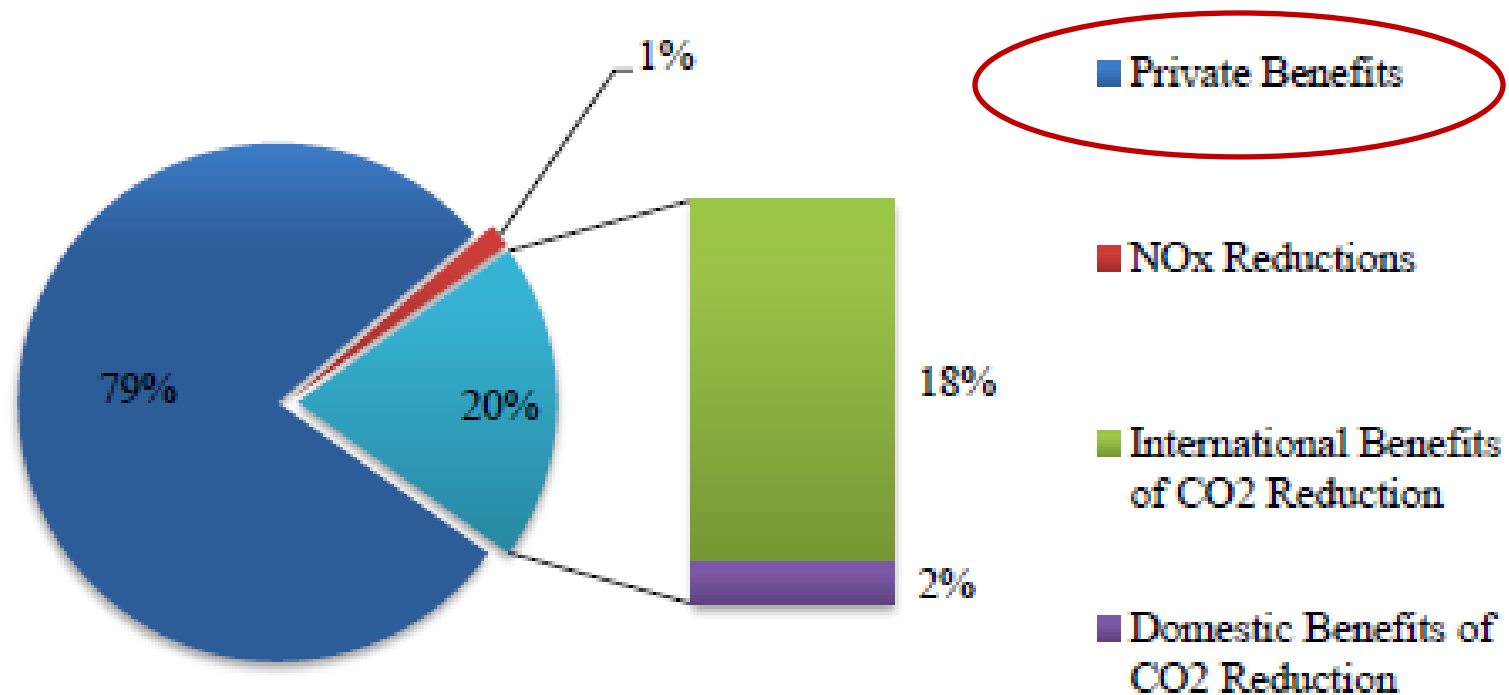
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**SUMMARY:** The Energy Policy and Conservation Act of 1975 (EPCA), as amended, prescribes energy conservation standards for various consumer products and certain commercial and industrial equipment, including commercial refrigeration equipment (CRE). EPCA also requires the U.S. Department of Energy (DOE) to determine whether more-stringent standards would be technologically feasible and economically justified, and would save a significant amount of energy. In this final rule, DOE is adopting more-stringent energy conservation standards for some classes of commercial refrigeration equipment. It has determined that the amended energy conservation standards for these products would result in significant conservation of energy, and are technologically feasible and economically justified.

**DATES:** The effective date of this rule is May 27, 2014. Compliance with the



Figure 1: Composition of Annualized Benefits for DOE's Proposed Commercial Refrigeration Rule



Source: Department of Energy's Technical Support Document for the Proposed Rule, *Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment*. Page 1-3.

# Behavioral Economics: Implications for Policy

- **Information and behavior** – provide useful information in an understandable; feedback & reflection
- **Incentives and behavior** – understand how consumers and firms will respond to specific incentives
- **Standard & behavioral models in BCA**  
sensitivity analysis

# **Behavioral Economics: BCA Quandary**

## **Robinson and Hammitt Risk Analysis (2011)**

The core issue raised by behavioral economics for BCA is whether consumer and firm choices in fact reflect welfare-enhancing preferences and objectives.

As with all market failures – how bad is failure for each issue considered?

# Small Internalities? Nudges as Shoves?

- Test: Comparing demand responses;  
if vehicle prices move as predicted with gas prices,  
consumers are not biased in evaluations of fuel economy
- Finding: Vehicle prices are highly responsive to gas  
prices and any bias is moderate at most
- Evidence: Discrepancy between engineering models  
(large internalities) & actual behavior (little or zero  
internalities)
- Allcott & Sunstein “Regulating Internalities” NBER (2015)

# Journal of Benefit-Cost Analysis

## JBCA 7,1 (**forthcoming** Spring 2016) A Special Issue

### **Introduction to the Special Issue on [Ir]rationality, Happiness, and Benefit-Cost Analysis**

Lisa A. Robinson, Guest Editor

### **The Good, the Bad, and the Ugly: A Unified Approach to Behavioral Welfare Economics (**open access**)**

B. Douglas Bernheim

### **Cost-Benefit Analysis, Who's Your Daddy? (on FirstView)**

Cass R. Sunstein

### **Do We Need a New Behavioral Baseline For BCA?**

Jason F. Shogren and Linda H. Thunström

### **Rational Benefit Assessment for an Irrational World**

Ted Gayer and W. Kip Viscusi

### **Bad Air Days: The Effects of Air Quality on Different Measures of Subjective Wellbeing**

Paul Dolan and Kate Laffan

### **Unequal Life Chances and Choices: How Subjective Well-Being Metrics Can Inform Benefit-Cost Analysis (on FirstView)**

Carol Graham

### **Behavioral Economics, Happiness Surveys, and Public Policy**

Matthew Adler



# Things that have worked

- BCA critiques for application & different technical backgrounds
  
- Slay dragons early
  1. All government spending does not have positive net benefits because it creates jobs & stimulates the economy!
  2. Republicans & Democrats support BCA!
  3. BCA has an ethical foundation in teleology
  4. Behavior matters! In avoiding unintended consequences & accounting for welfare reducing behavior





TABLE I.3—SUMMARY OF NATIONAL ECONOMIC BENEFITS AND COSTS OF AMENDED COMMERCIAL REFRIGERATION EQUIPMENT ENERGY CONSERVATION STANDARDS\*

Category	Present value Billion 2012\$	Discount rate (percent)
<b>Benefits</b>		
Operating Cost Savings .....	7.70	7
	16.63	3
CO <sub>2</sub> Reduction Monetized Value (\$11.8/t case)** .....	1.01	5
CO <sub>2</sub> Reduction Monetized Value (\$39.7/t case)** .....	4.55	3
CO <sub>2</sub> Reduction Monetized Value (\$61.2/t case)** .....	7.20	2.5
CO <sub>2</sub> Reduction Monetized Value (\$117/t case)** .....	14.05	3
NO <sub>x</sub> Reduction Monetized Value (at \$2,591/ton)** .....	0.03	7
	0.10	3
Total Benefits† .....	12.28	7
	21.28	3
<b>Costs</b>		
Incremental Installed Costs .....	2.77	7
	4.89	3
<b>Net Benefits</b>		
Including CO <sub>2</sub> and NO <sub>x</sub> † Reduction Monetized Value .....	9.51	7
	16.40	3

\*This table presents the costs and benefits associated with commercial refrigeration equipment shipped in 2017–2046. These results include benefits to customers which accrue after 2046 from the equipment purchased in 2017–2046. The results account for the incremental variable and fixed costs incurred by manufacturers due to the amended standard, some of which may be incurred in preparation for this final rule.

\*\*The CO<sub>2</sub> values represent global monetized values of the SCC, in 2012\$, in 2015 under several scenarios of the updated SCC values. The first three cases use the averages of SCC distributions calculated using 5%, 3%, and 2.5% discount rates, respectively. The fourth case represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The SCC time series used by DOE incorporates an escalation factor. The value for NO<sub>x</sub> is the average of the low and high values used in DOE's analysis.

† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to average SCC with 3-percent discount rate.

# Commercial Consumer v. Expert

The cumulative net present value (NPV) of total consumer costs and savings of today's standards for commercial refrigeration equipment ranges from \$4.93 billion (at a 7-percent discount rate) to \$11.74 billion (at a 3-percent discount rate).<sup>7</sup> This NPV expresses the estimated total value of **future operating cost savings** minus the estimated increased product costs for products purchased in 2016–2047.

Public Interest Comment<sup>1</sup> on  
The Department of Energy's Proposed Rule  
Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration  
Equipment

Docket ID No. EERE-2010-BT-STD-0003

RIN: 1904-AC19

November 12, 2013

Sofie E. Miller, Policy Analyst<sup>2</sup>

The George Washington University Regulatory Studies Center

Additionally, DOE does not explain why sophisticated, profit-motivated purchasers of commercial refrigeration would suffer from either informational deficits or cognitive biases that would cause them to purchase products with high lifetime costs without demanding higher-price, higher-efficiency products. This asymmetric information, if it exists, could be remedied by improved labeling or other types of consumer education campaigns rather than banning products

# Behavioral Economics & BCA

Hammitt *REEP* (2013):

- Jefferson (1820): “I know of no safe repository of the ultimate powers of society but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the **remedy is not to take it from them, but to inform their discretion by education.**”
- Burke (1774): “**Your representative owes you**, not only his industry, but **his judgment**; and he betrays, instead of serving you, if he sacrifices it to your opinion.”

# Choices

- **Economics**: making decisions so as to get the most possible – efficiency
- **Ethics**: philosophical discipline, study of morality
  - Reasoned analysis to clarify & resolve issues
- Ethical basis for BCA?

# Contrast with Deontology

- Moral theory comprised of **obligate moral rules** independent of consequences of acting on them
- Kant's ***categorical imperatives*** to do right
- Plato's concept of ***goodness*** and justice
- Judeo-Christian ethic, ***conscience***, Ten Commandments
- Who decides? ***Proper souls***, persons with insight

# Implications of Deontology

- Circumstances are irrelevant
- Consequences can be ignored
- Absolute! All or nothing
- Rely on wisdom & judgment of experts
- Cost-effectiveness analysis (CEA) is ok

***What ought to be?***