Comments on David Greene's
"Uncertainty, Loss Aversion, and Markets for Energy Efficiency"

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Observation

Consumers' willingness to pay for better fuel economy implies short payback periods:

Source	Implied Payback Period
Auto Manufacturers (Greene *et al.*, 2009)	2-4 years
DOE-funded study (Opinion Research Corp. Survey, 2004)	1.5-2.5 years

Questions

1. What are some plausible explanations for consumers "overdiscounting" of future fuel savings?

2. How much do consumers "overdiscount" relative to a well-informed consumer with no loss of risk aversion?

3. What are the normative (policy) implications of issue 2 above?
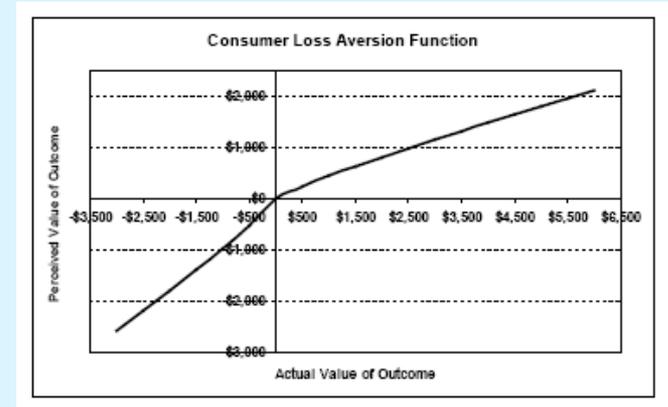   -- should public policy treat loss aversion differently from risk aversion?

1. What are some plausible explanations for consumers "overdiscounting" of future fuel savings?

- Loss aversion

$$V(x) = \begin{cases} x^{\alpha} & if \ x \geq 0 \\ -\lambda(-x)^{\beta} & if \ x < 0 \end{cases}$$

Consumer Loss Aversion Function

$\lambda > 1$ implies loss aversion

(a concave of *V(x)* implies risk aversion)

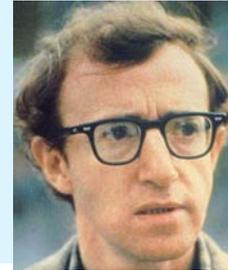Other possible reasons (not the focus of paper):
- Risk aversion
- Lack of information
- Limited cognitive processing capabilities

2. How much do consumers "overdiscount" relative to a well-informed consumer with no loss or risk aversion?
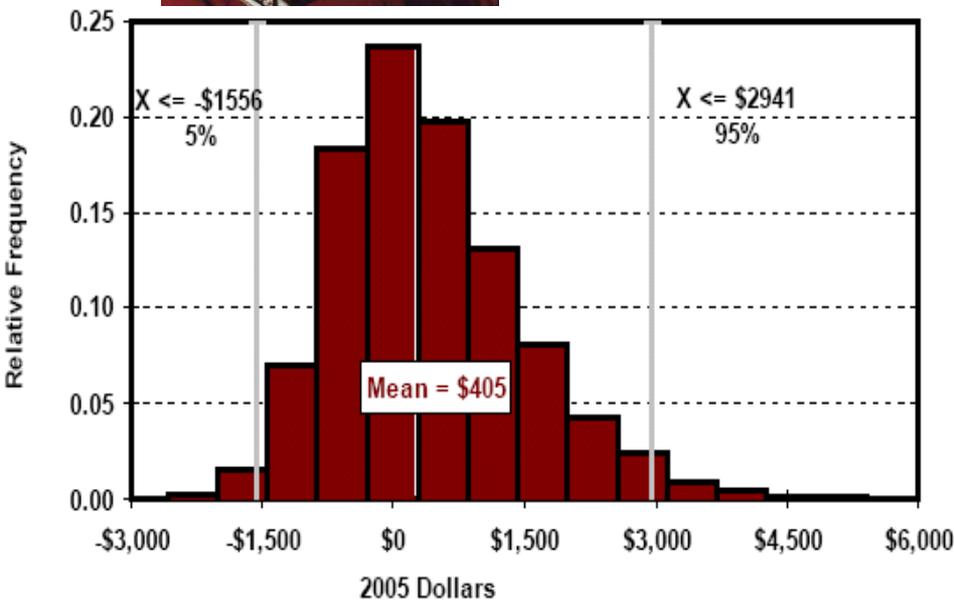
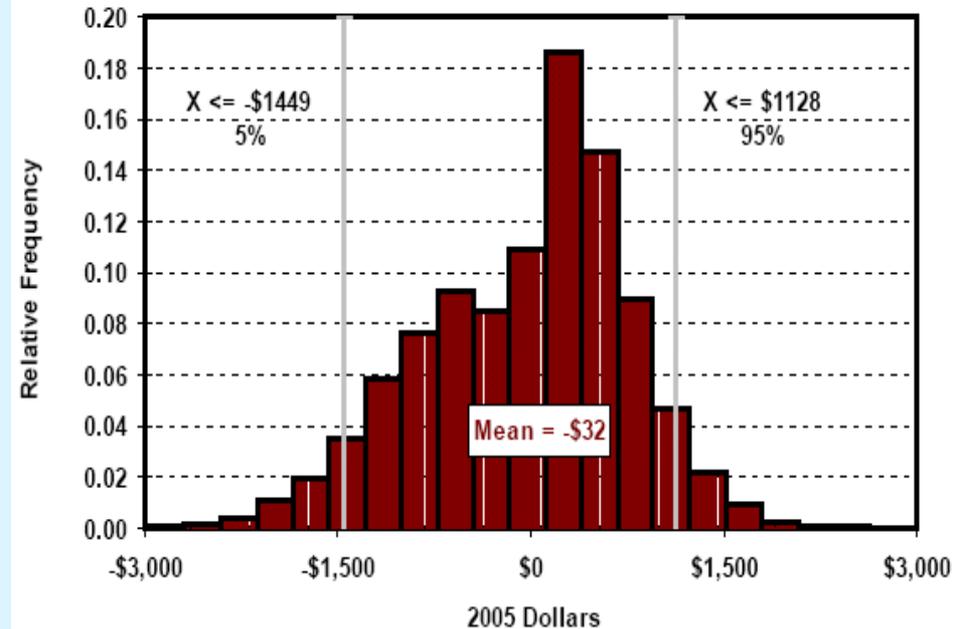Net Present Value of Fuel Economy Increase from 28 to 35 MPG

Homo Economicus

Loss and Risk Averse Guy

Mean WTP = $405

Mean WTP = $-32
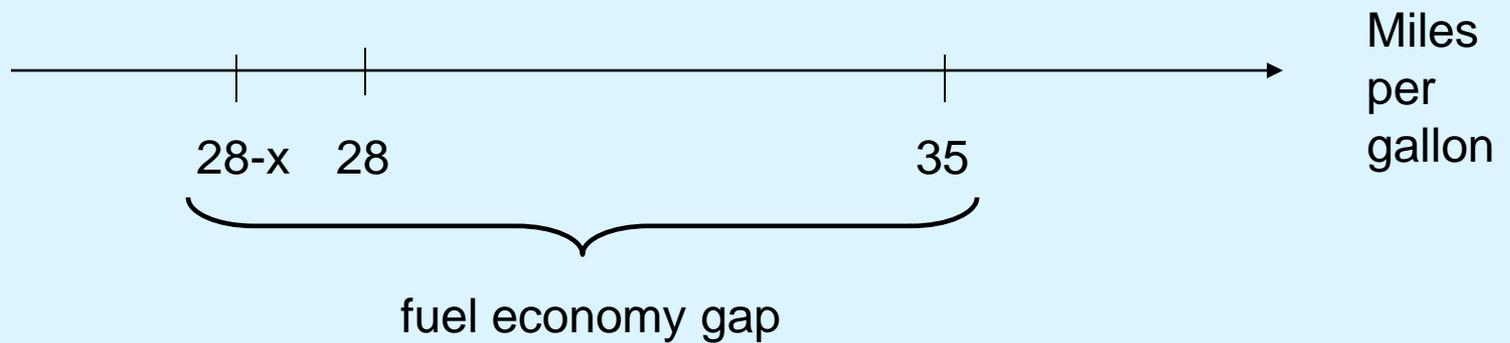
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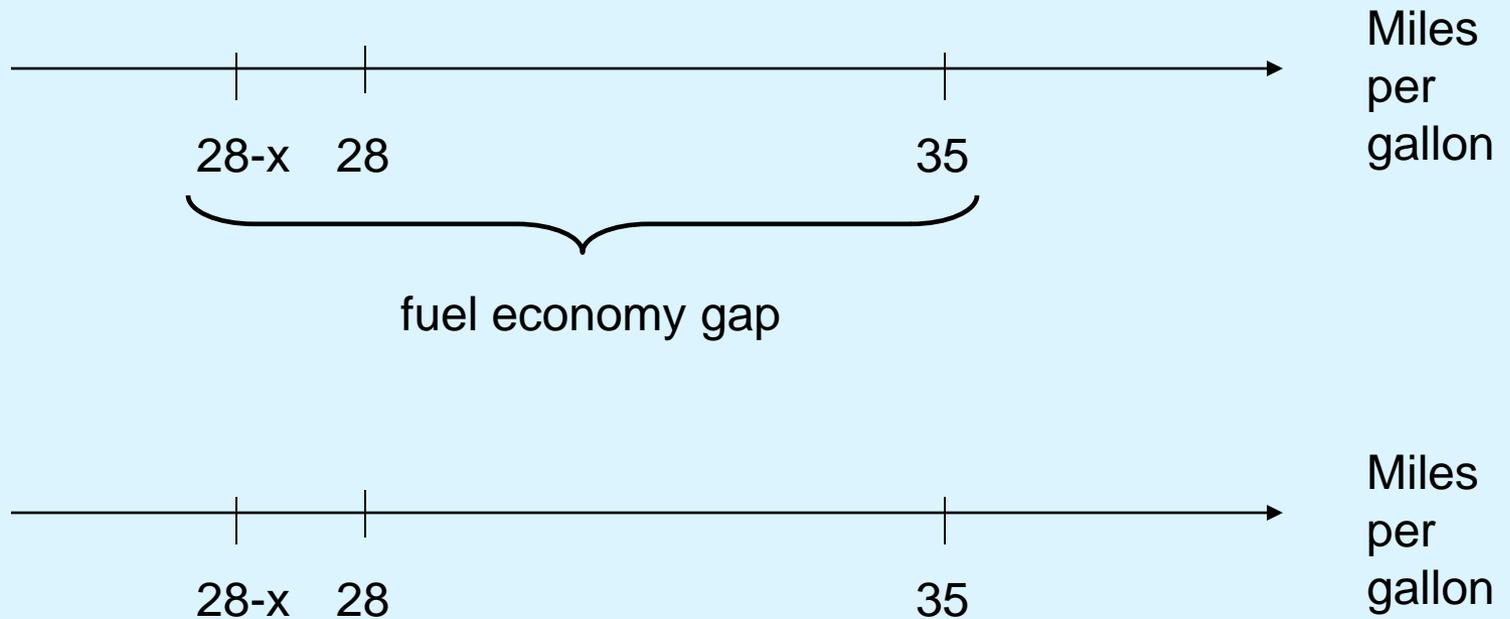
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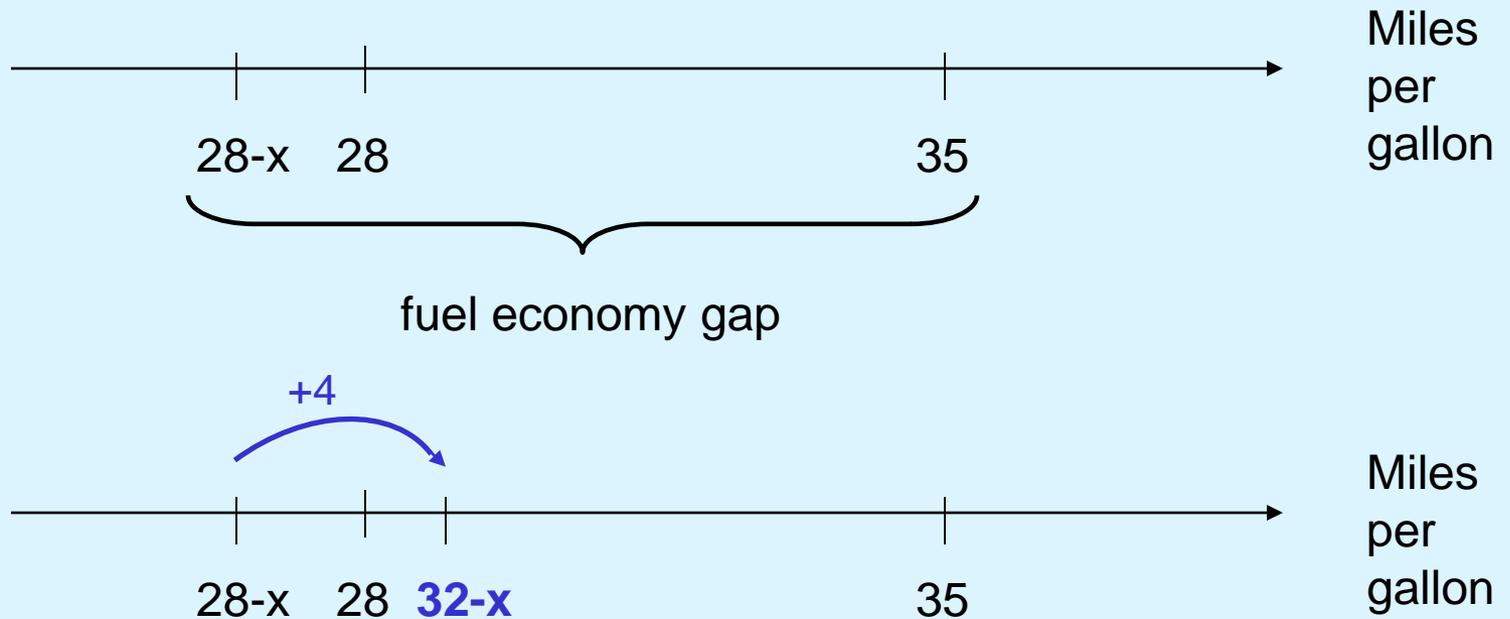
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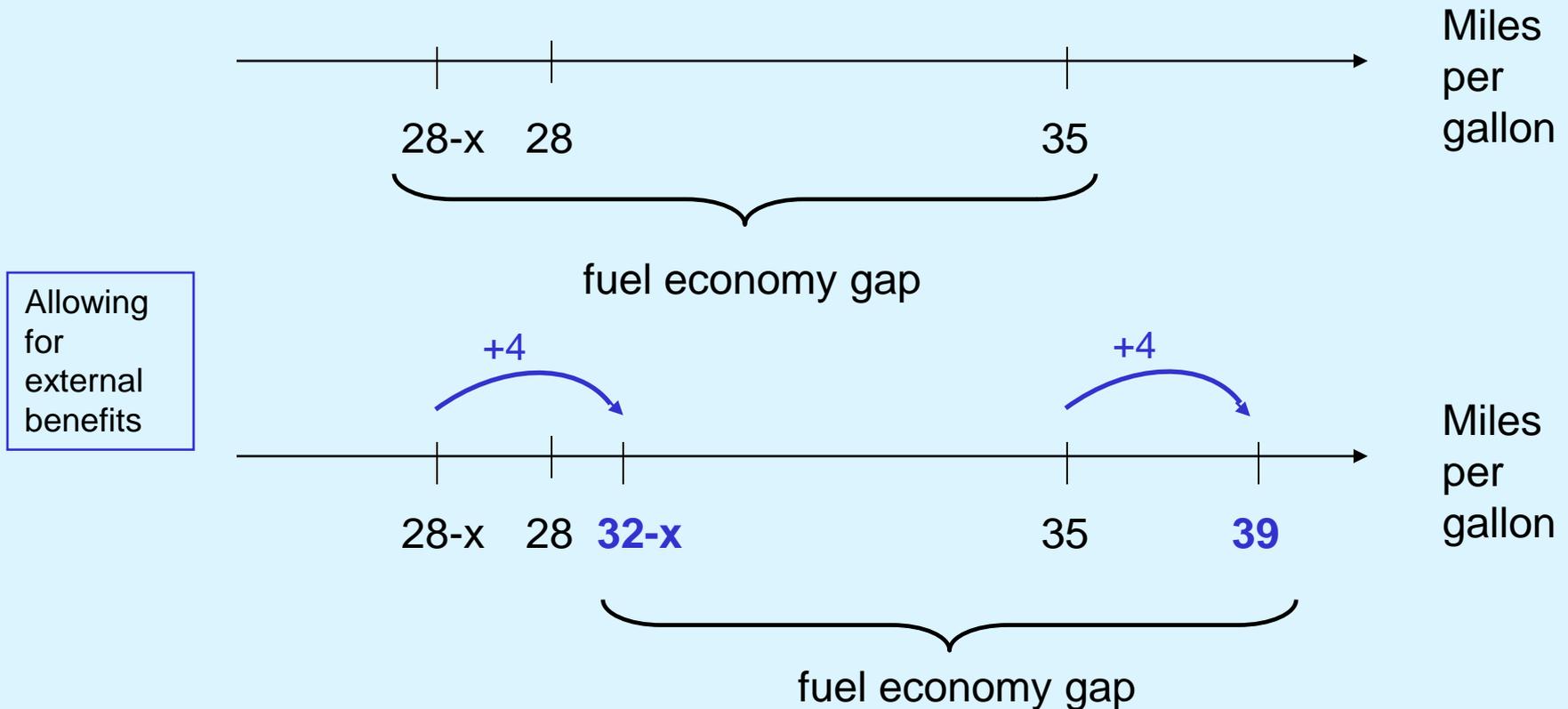

Allowing for external benefits

From DG's results, 7 mpg seems a *lower bound* on the size of the gap.

Comments/Suggestions re Issue 2:

a. Expand discussion of the "fuel economy gap" implied by the results (including "x factor").

b. Fragility/robustness of the results?
   -- how confident are we in the chosen utility function parameters (from Bernatzi and Thaler, 1995)?

c. How big of a gap would arise from pure risk aversion (and no loss aversion)?
   -- suggest applying same data and methodology with risk aversion only

$$(V(x) = x^{\alpha}, \quad \alpha < 1)$$

3. What are the normative (policy) implications of issue 2 above?

Suppose:

- ULAB is real (DG's results are right on the mark)
- consumers are well informed and suffer no limitations in ability to process the information.

Where should government set fuel economy?

+4   +4

Miles
per
gallon

28-x   28   **32-x**   35   **39**

Note that here

- externalities are accounted for
- consumers are acting according to their own loss preferences, and are not imposing *new* externalities on others

  (even though their future selves are not enjoying the largest expected gains)

- Does context-dependence of loss aversion make a difference?

Implications for Policy Analyses

1. Suggest treating loss aversion like risk aversion. Use ex ante preferences to govern policy. No need to lament the departure from expected value maximization.

2. What to do about other sources of the fuel-economy gap?

   Lack of information:
   -- introduce supplementary information-supplying policies (subject to benefit-cost test)

   Limited processing abilities:
   -- not sure; paternalism issue

Conclusions

Intriguing paper on important topic

Existing analysis well performed

Should policy makers address loss aversion differently from risk aversion?

Suggest going further:
- expand discussion of size of fuel economy gap
- consider separate contributions of risk and loss aversion
- address the uncertainties related to utility parameters chosen; perform sensitivity analysis
- expand discussion of implications for policy analysis

General Comments

1. **Entrepreneurship is good.**

2. **Large infrastructure investments are key component of transformational change.**

    - Infrastructure decisions generally not made in markets.
    - Chicken-and-egg problem important. Need consider infrastructure and private-good-production decisions simultaneously.
    - Non-convexities may apply, implying multiple equilibria. Marginal analysis can't be guaranteed to reveal optimal policy choice. Need for simulation modeling.