Nicotine Regulatory Policy: Guidance from Cost-Benefit Analysis

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Disclosures

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CBA and the economic efficiency of nicotine regulations

- CBA is a tool to evaluate whether regulations fix market failures and improve economic efficiency.
  - Economic efficiency requires that societal resources are in their most highly valued use.
  - Regulation changes the allocation of resources => winners & losers
- A regulation improves economic efficiency if the winners could potentially compensate the losers, and still be better off themselves.
  - Benefits > Costs ⇔ regulation improves economic efficiency
- More formally:
  - CBA identifies potential Pareto/Kaldor-Hicks improvements
  - Calculate the sum of the compensating variations in income for everyone who either wins or loses because of the regulation.

Market Success

"It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest..... by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention." Adam Smith, *Wealth of Nations*

Trial, Error, and Nicotine Market Success

- Medical research on risks of smoking created consumer demand for healthier nicotine products

- US market share of filtered cigs grew from 58% in 1963 to 99.8% in 2011
- US market share of ≤ 15 mg tar grew from 2% in 1967 to 94.7% in 2011

Little or no risk reduction

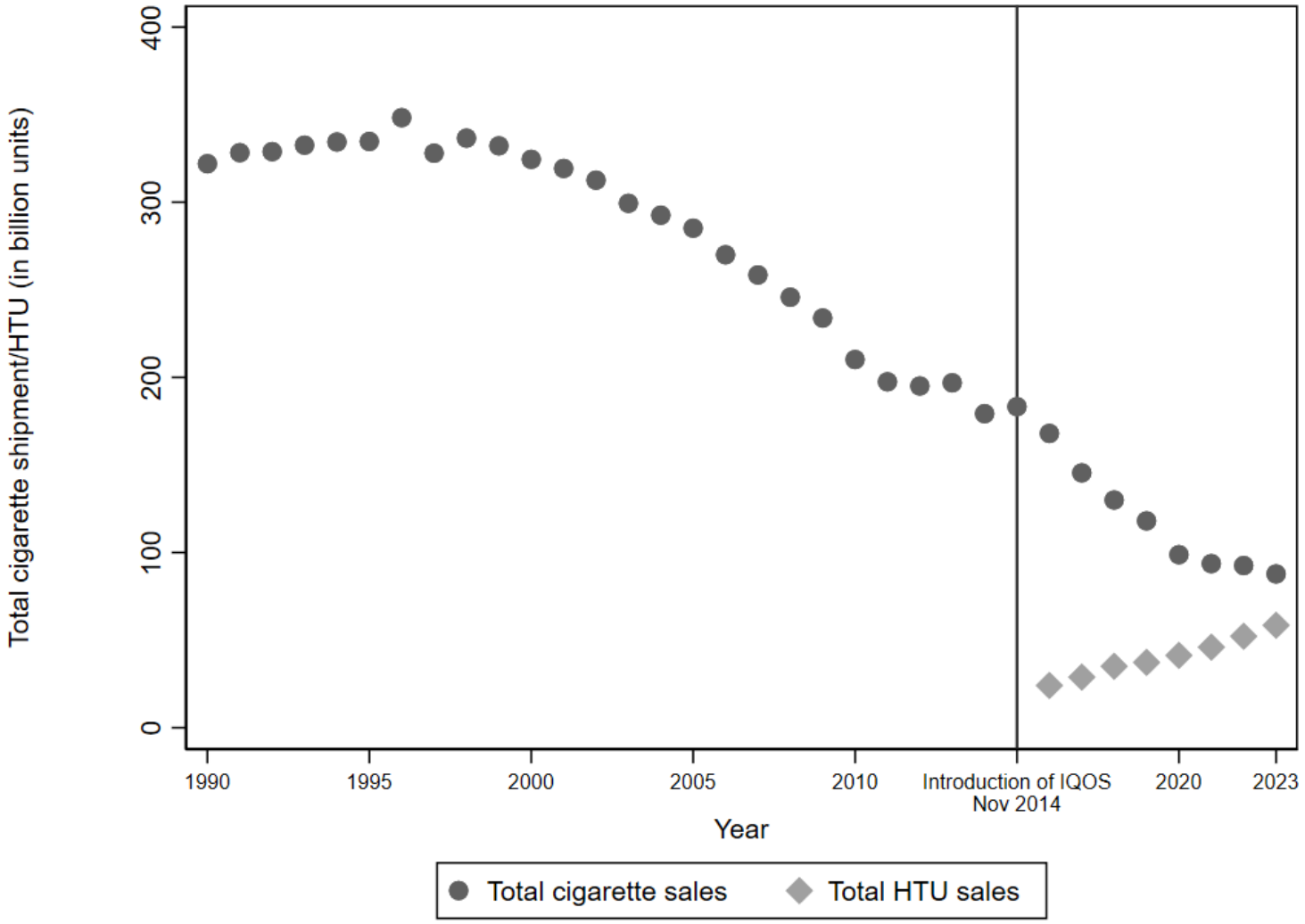
- 2022 launch of VLN™ cigarettes with 95% less nicotine than other cigs

VLN™ has very low market share

- Nicotine replacement therapy
- Snus
- E-cigarettes/ heated tobacco products
- Nicotine pouches, etc.

Success!

Total Cigarette and Heated Tobacco Shipments, Japan 1990 - 2023



Market failures limit the success of the market for reduced-risk nicotine

- Market failures => consumers make inefficient choices between smoking & reduced-risk nicotine products
  - Smokers impose negative externalities through secondhand smoke.
  - Smokers are misinformed about the relative and absolute risks of vaping.
- Smokers' decision-making errors (individual failures to optimize) impose "internalities" on their future selves.
  - Errors could be due to lack of information or decision-making "errors" explored in behavioral economics research
  - Addiction isn't necessarily irrational, but addiction => past decision-making errors can continue to affect addictive consumption choices through the consumption capital stock (adjacent complementarity)

Nicotine regulatory policy should try to shift smokers into reduced-risk nicotine markets

- Policies to improve consumer information about the relative risks of e-cigarettes and other non-combusted nicotine products correct market & individual failures.
  - My colleague Alan Mathios will talk more about consumer information.
- Market & individual failures are a necessary but not sufficient condition for regulatory policy to increase economic efficiency.
  - Strict regulations could also move smoking => vaping, but will B > C?
- Work-in-progress: CBA of US FDA proposal to prohibit menthol cigarettes.
  - Opportunity costs imposed on menthol smokers = $24 billion/year
  - Increased costs to supply illegal cigarettes = $10.3 billion/year
  - Benefits of reduced externalities = $18.9 billion/year
  - Benefits of reduced internalities = ?

CBA Motto

And so, having made my plea, let me salute the profession with what might well have been the title of this paper, with what is certainly the key that points to the solution of most problems in applied welfare economics, with what surely should be the motto of any society that we applied welfare economists might form, and what probably, if only we could learn to pronounce it, should be our password:

$$\text{“} \int_{z=0}^{z^*} \sum_i D_i(z) \frac{\partial X_i}{\partial z} dz. \text{”}$$

Society for Benefit-Cost Analysis

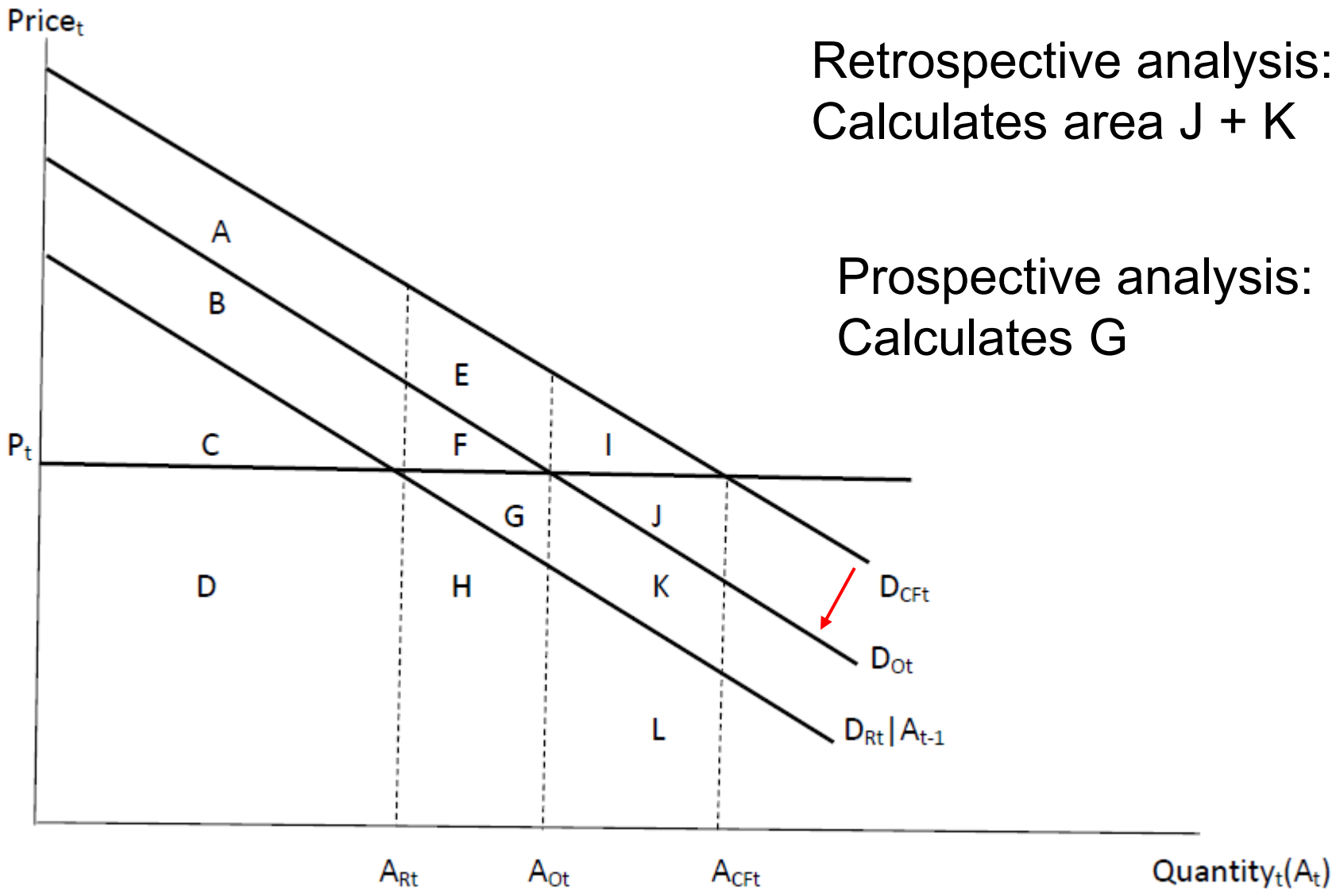



CBA of informing consumers about the risks of smoking policies

- Retrospective CBA of policies since 1964
  - Informational policies → D curve shifts inward
    - Total cig cons is 28% lower than in counter-factual where D stayed the same
  - Estimated “rational D” based on smoking behavior of college-educated smokers
  - Used areas to estimate consumer benefits = $573 bill.
  - No hard estimate of costs, maybe $6.5 bill.
- Prospective CBA of future FDA policies: less likely to have benefits > costs
- Source: Jin, Kenkel, Liu & Wang: *J. of BCA*, 2015

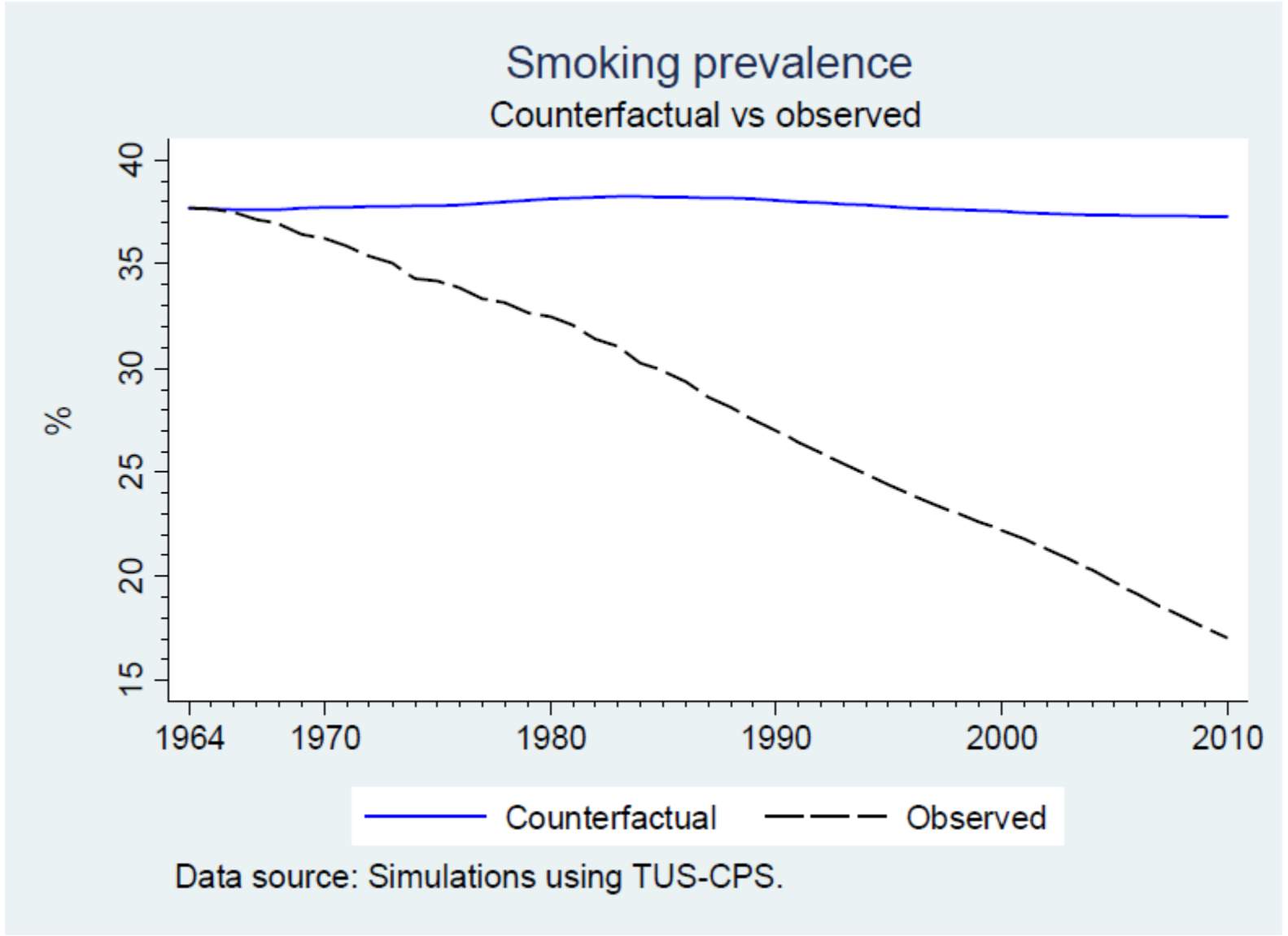
Analysis used 3 demand curves

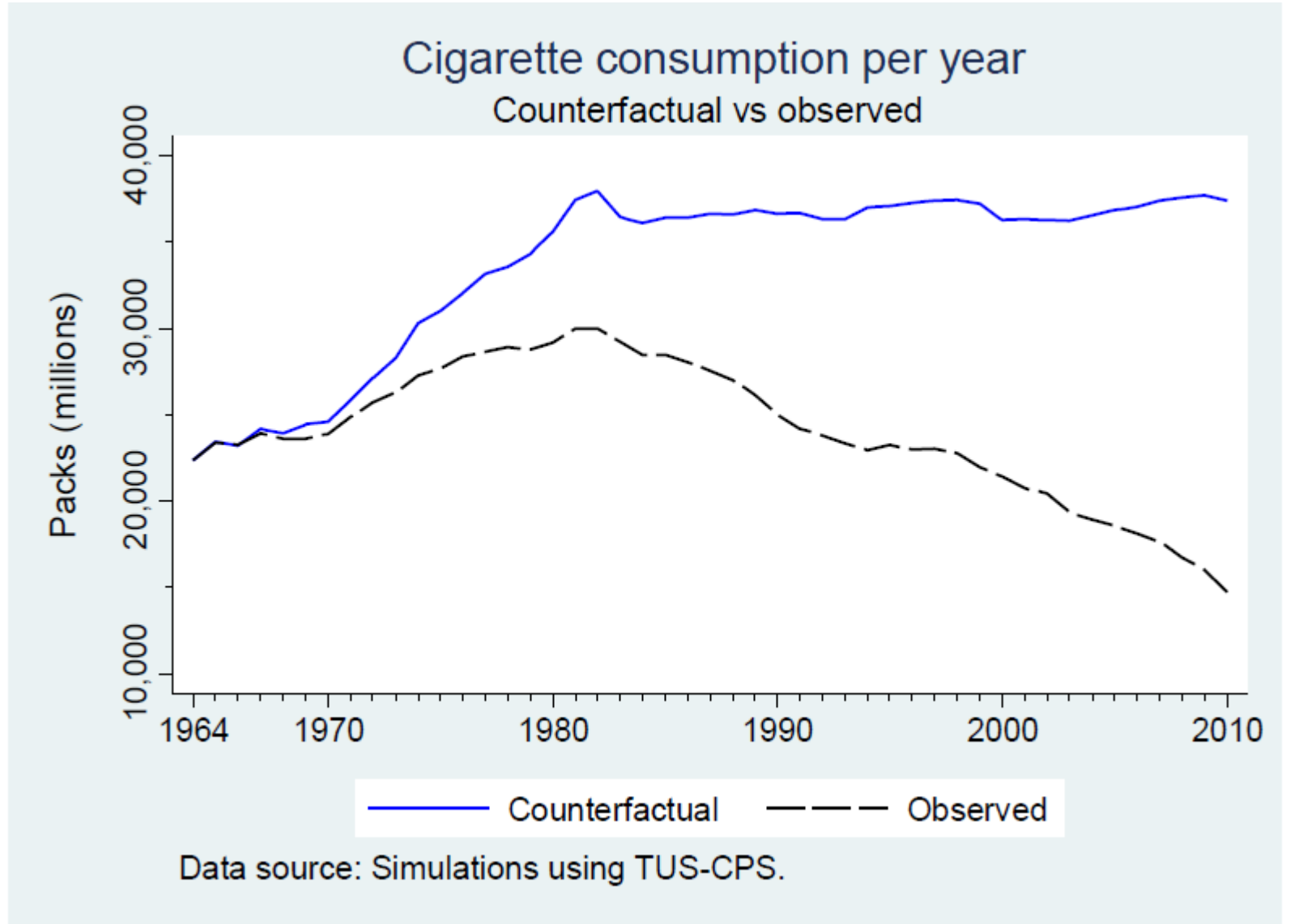
- Counter-factual D_{CF} shows cigarette demand in counter-factual world if there had never been any anti-smoking policies (based on pre-1964 demand, adjust for pop'n)
- Observed D_O is what really happened
- Rational D_R is used for CBA
- Deadweight loss in counter-factual = areas G + J + K
- Retrospective analysis: policies shifted D_{CF} to D_O
  - Policies yield benefits = areas J + K
- Prospective analysis: new policies shift D_O to D_R
  - Policies yield benefits = area G

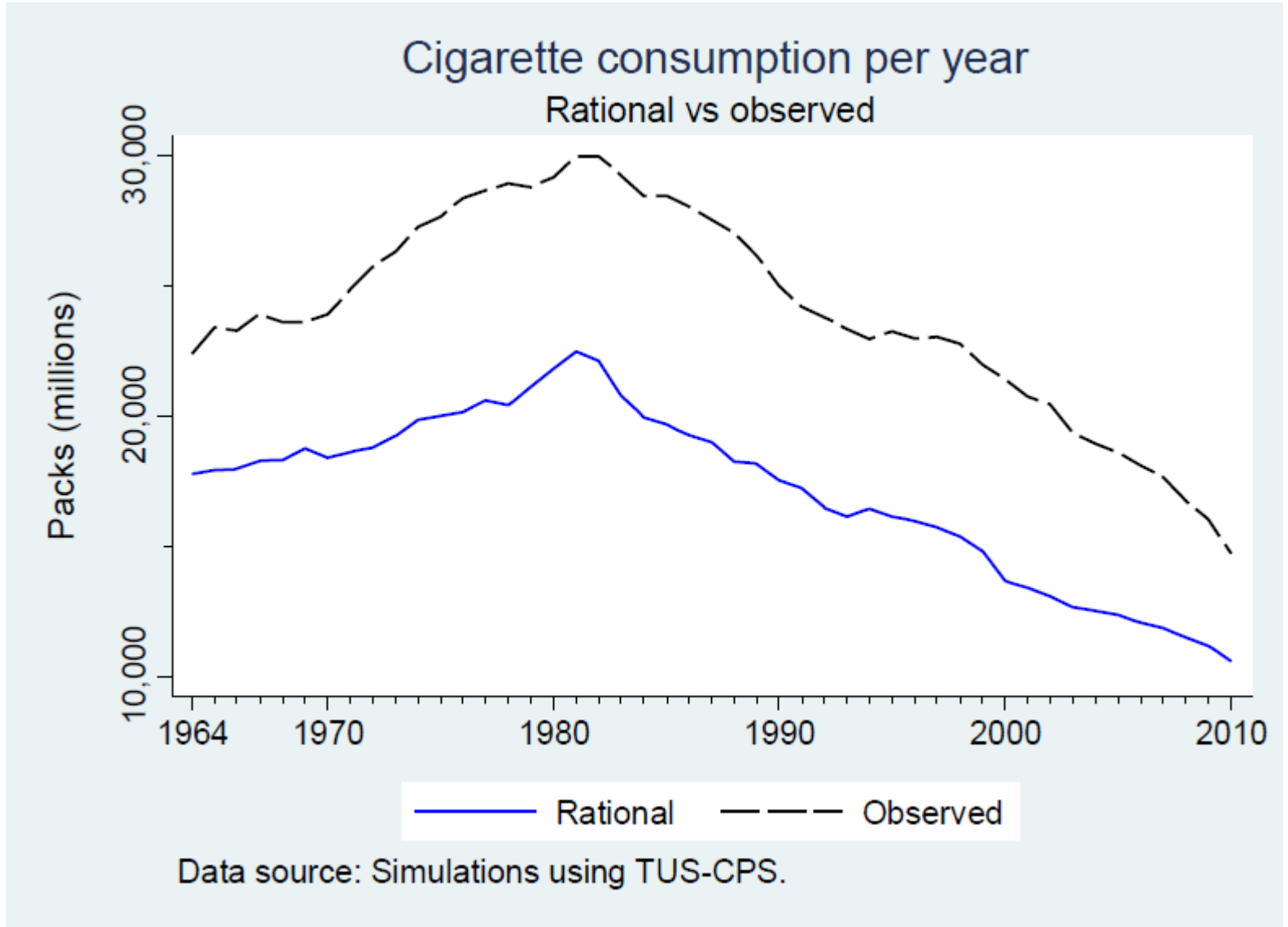


Retrospective analysis:
Calculates area J + K

Prospective analysis:
Calculates G

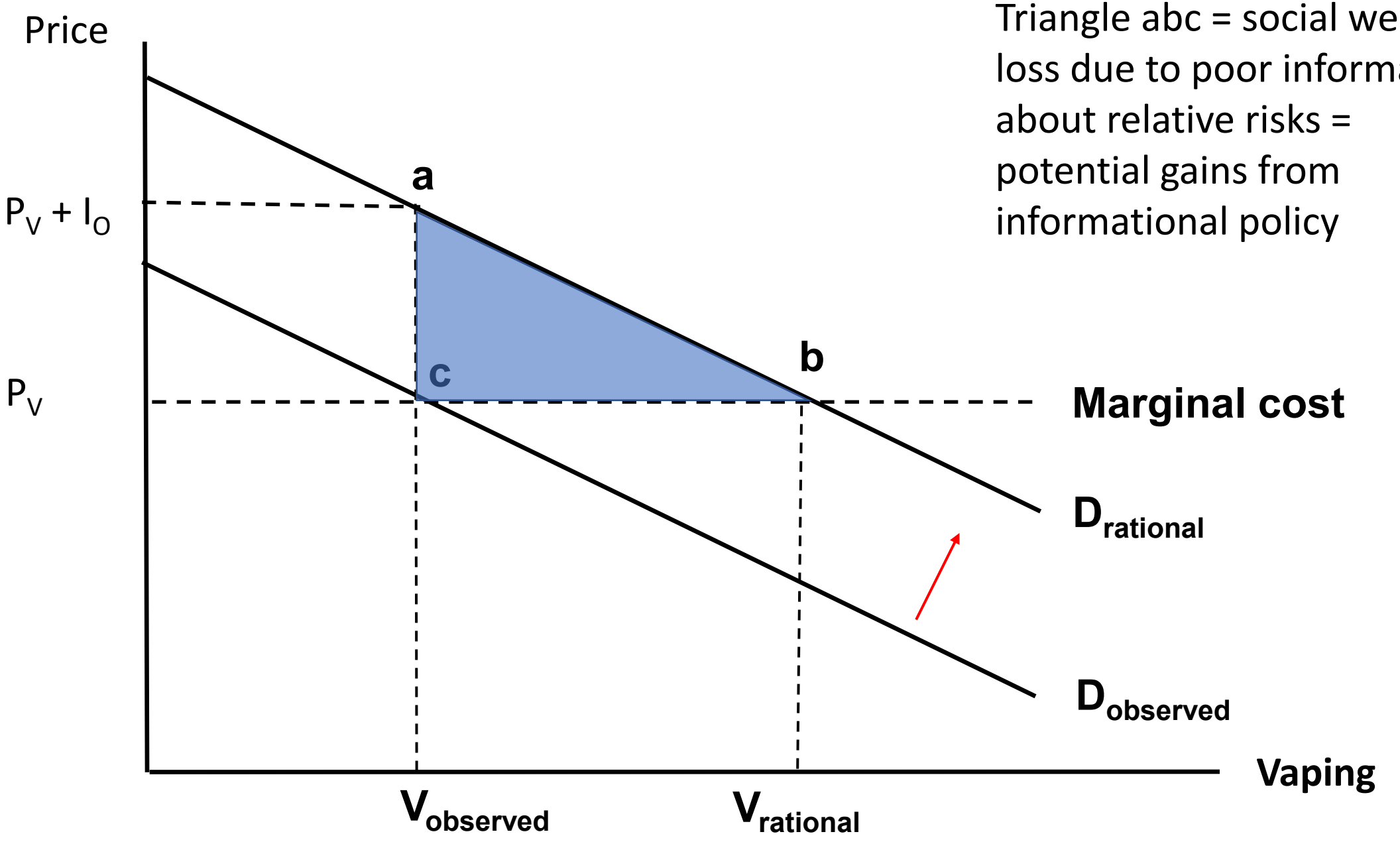

Smoking prevalence
Counterfactual vs observed
%
15
20
25
30
35
40
1964
1970
1980
1990
2000
2010
Counterfactual
Observed
Data source: Simulations using TUS-CPS.


Cigarette consumption per year
Counterfactual vs observed
Packs (millions)
10,000
20,000
30,000
40,000
1964
1970
1980
1990
2000
2010
Counterfactual
Observed
Data source: Simulations using TUS-CPS.


Cigarette consumption per year
Rational vs observed
Packs (millions)
30,000
20,000
10,000
1964
1970
1980
1990
2000
2010
Rational
Observed
Data source: Simulations using TUS-CPS.

CBA of informing consumers about the lower relative risks of vaping

- Need an estimate of how much improved information will shift demand curve.
- Conduct CBA with reference to a “rational demand curve” for vaping that shows the demand by fully informed consumers.
- Key parameters: demand elasticities, size of internality.
- Work-in-progress.



Triangle abc = social welfare loss due to poor information about relative risks = potential gains from informational policy

Predicting stakeholder impacts is not the same as estimating benefits and costs

- **Stakeholder impact analysis**: Predict impacts on major stakeholders including smokers, non-smokers exposed to secondhand smoke, tobacco manufacturers & growers, e-cigarette manufacturers, healthcare system, tax revenues.
- **Public health impact analysis**: Predict impacts on smokers' and non-smokers mortality and morbidity risks.
  - Example: dynamic population health simulation model (Mendez & Warner)
- **CBA identifies if resources are in their most highly valued use**
  - Given market failure, societal resources used to make cigarettes would be more valuable if they were used to make e-cigarettes.
- CBA ≠ maximizing government revenue; CBA ≠ maximizing manufacturer profits
- CBA ≠ maximizing public health

“There are no solutions. There are only trade-offs.”

Thomas Sowell, PhD
Senior Fellow
Hoover Institution
Stanford University.