

CTA and Medical Innovation: A Broader Economic Appraisal

*Tomas J. Philipson
The University of Chicago*

VALUE & VALUATION
OF HEALTH TECHNOLOGIES:
DEVELOPING A SWISS CONSENSUS

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Outline

- 1-The Appropriation of Value by Innovators
- 2-CEA, CER and Medical Innovation
- 3-Swiss Take Home Messages

The Appropriation of Value by Innovators

Discussed Work

- T. Philipson and A. Jena, “Who Benefits from New Medical Technologies? Estimates of Consumer and Producer Surpluses for HIV/AIDS Drugs”, *Forums for Health and Health Policy*, 2006.
 - **Popular Version:** T. Philipson and A. Jena, (2006), “Dividing The Benefits from Medical Breakthroughs”. *The Milken Institute Review*, Volume 8, No 1, pp 46-56.

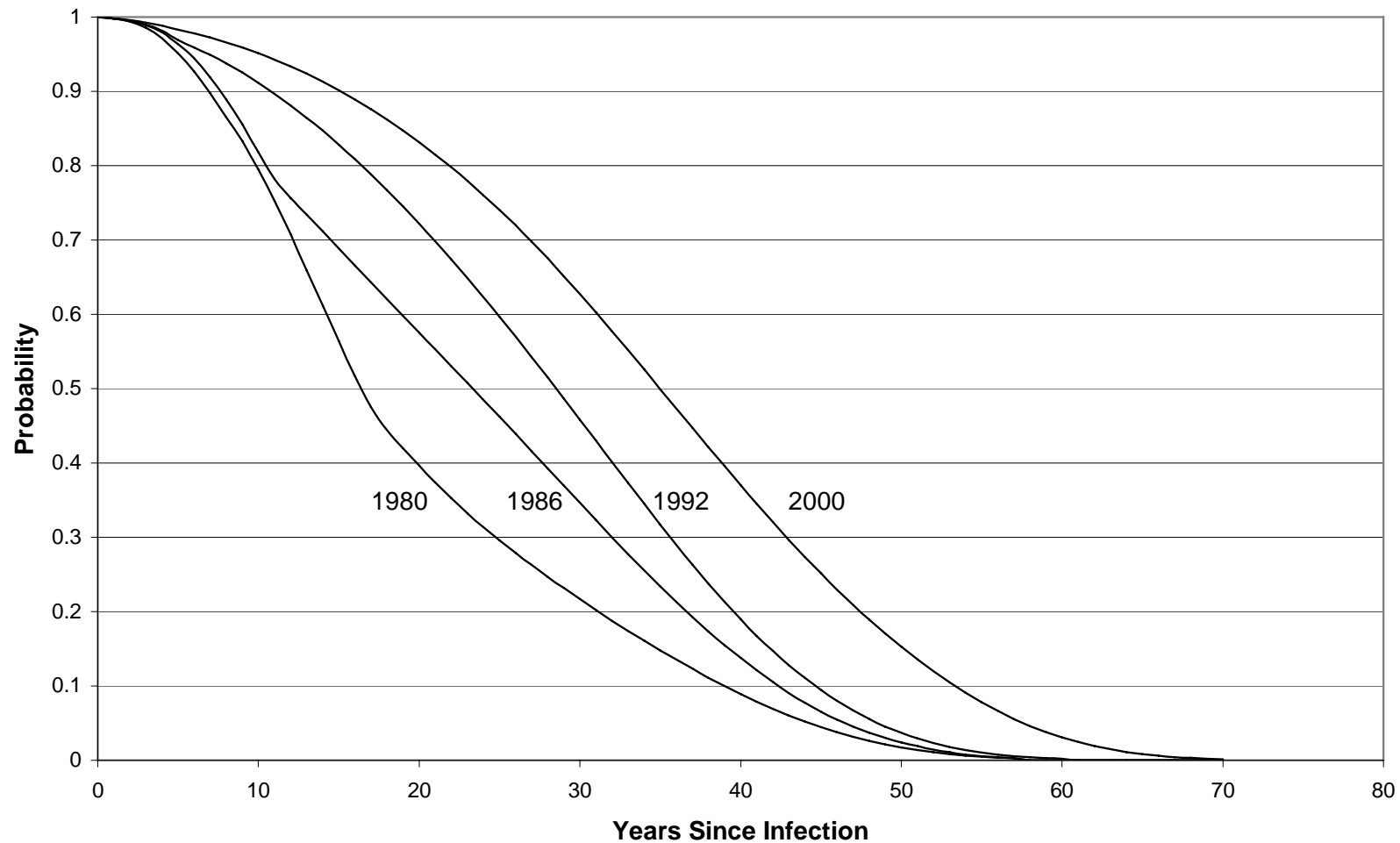
Value Division of New Technologies

Example : I-Pod

- Initially sold at price \sim \$300
- Some individuals *willing to pay* more than price
 - Average WTP among consumers $>$ \$300, say \$ 600
 - Cost of production is \$100
- Avg. Consumer gain = \$300
- Avg. Producer gain = Profit = \$200
- Social Gain (Consumer + Producer)=\$500
- Key Issue: CTA and *Pricing* Determines Division of Surplus

Surplus from HAART for HIV

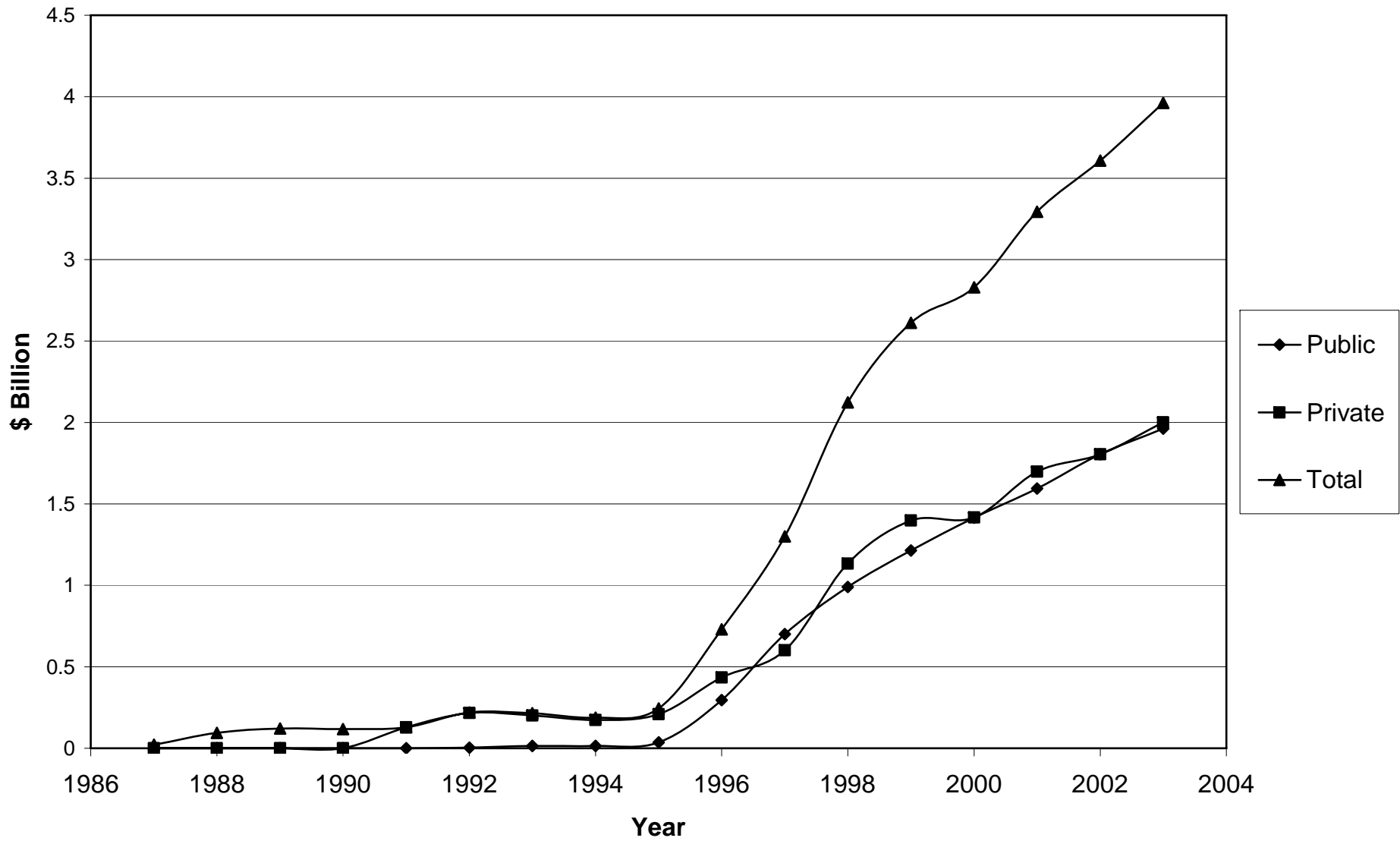
Figure 3: Survival from HIV by Year of Infection



Valuing Patient Gains in HIV-Survival

- Individually
 - How much would someone infected with HIV in 2000 have to be paid to accept the worse survival when virus was discovered in early 80's?
 - Value of a Life Year = \$100K and average increase across all infected cohorts at least 10 yrs → a gain of about \$1M per patient
- Aggregate by Cohort
 - Multiply the value of improved survival for each cohort by that cohorts incidence of HIV
 - E.g. 1 million infected to date in US → $1M \times \$1M = \$1T$

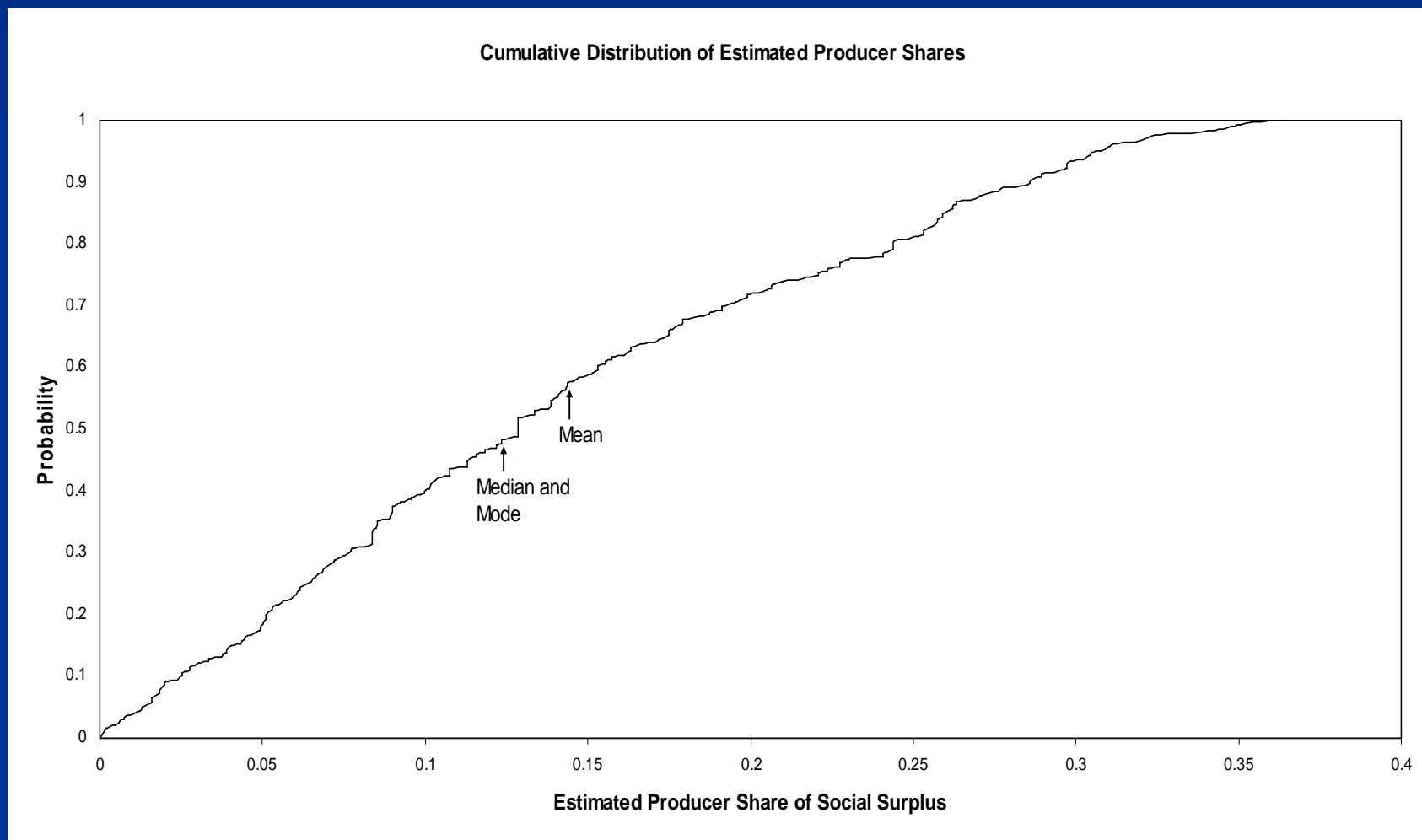
Figure 4: National Spending on HIV/AIDS Drugs



Share of Overall Value To Innovators

- Total gain was about \$1.4 trillion
- How much to innovators?
 - Estimate Profits to Producers
 - Use Product Sales Data (upper bound on profits)
 - Use Estimates of Production Costs from Generic Prices
 - Estimated \$63 billion in present value profits
- About 5% of social value arising from HIV drugs is captured by innovators

Distribution of Appropriation Across a Sample of Technologies (Harvard Registry) (Jena and Philipson, JHE, 2008)



Why does appropriation matter?

- *Short Run:* Efficient pricing at cost
 - No patients willing to pay 5K for HIV therapy at 20K
- *Long Run:* Efficient pricing above costs
 - Rationale for patent system
 - More Cost-effective care not a desirable goal
- *Basic Problem:* R&D committees focus on small share of social value
 - Median value estimated at 12%

Public Financing and Innovation

- The R&D vs Access Tradeoff
- Social Insurance
 - Two prices-producers versus consumers
 - Allows for access (“solidarity”) with innovation
 - Premium support vs central pricing
- Monopsony power reduces prices below market
 - CTA and Patents conflicting
- Solidarity to whom?
 - Innovation lowers real prices for young

Reimbursement in US v& Abroad

- US market responsible for large share of world sales and profits
 - About 50% of world drug sales occurs in US
 - US GDP is only about 22% of world GDP
- Reform Proposals abroad--different incentives
 - Innovation tradeoff in reimbursement policy different in US and Switzerland
 - Tragedy of the commons and European policy
- Solidarity and health care policy
 - With and without innovation

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CEA in Practice

- Price control through quality-adjusted prices (Housing)
- CEA in *theory* uses resource *COSTS*
 - Determines economic efficiency
- CEA in *practice* uses *PRICES*
- CEA in practice reverses intended goals of exogenous CE
 - Threshold
- Empirical analysis from NICE 1999 – 2005
- Tests for reversals across classes
- NICE accepts most appraisals
 - Not sign of pro-innovation
 - Sign of transparency
- Work: Jena, A., and T. Philipson (2010), “Endogenous Cost-Effectiveness Analysis”, NBER Working Paper.

CER in Practice

- American Recovery and Reinvestment Act dedicated \$1.1 billion for CER
- Publicly financed quality assessments long history in US
- Proponents argue that CER will:
 - Improve health & lower spending
- Recent Work:
Basu and Philipson (2009), “The Impact of CER on Health and Health Care Spending”, National Bureau of Economic Research, Working Paper (www.nber.org), forthcoming *Journal of Health Economics*.

Economic Incentives and CER

CER affects beliefs about product quality

Winners of CER perceived of higher quality

Losers of CER perceived of lower quality

Beliefs about product quality drive utilization

Higher demand for CER winners

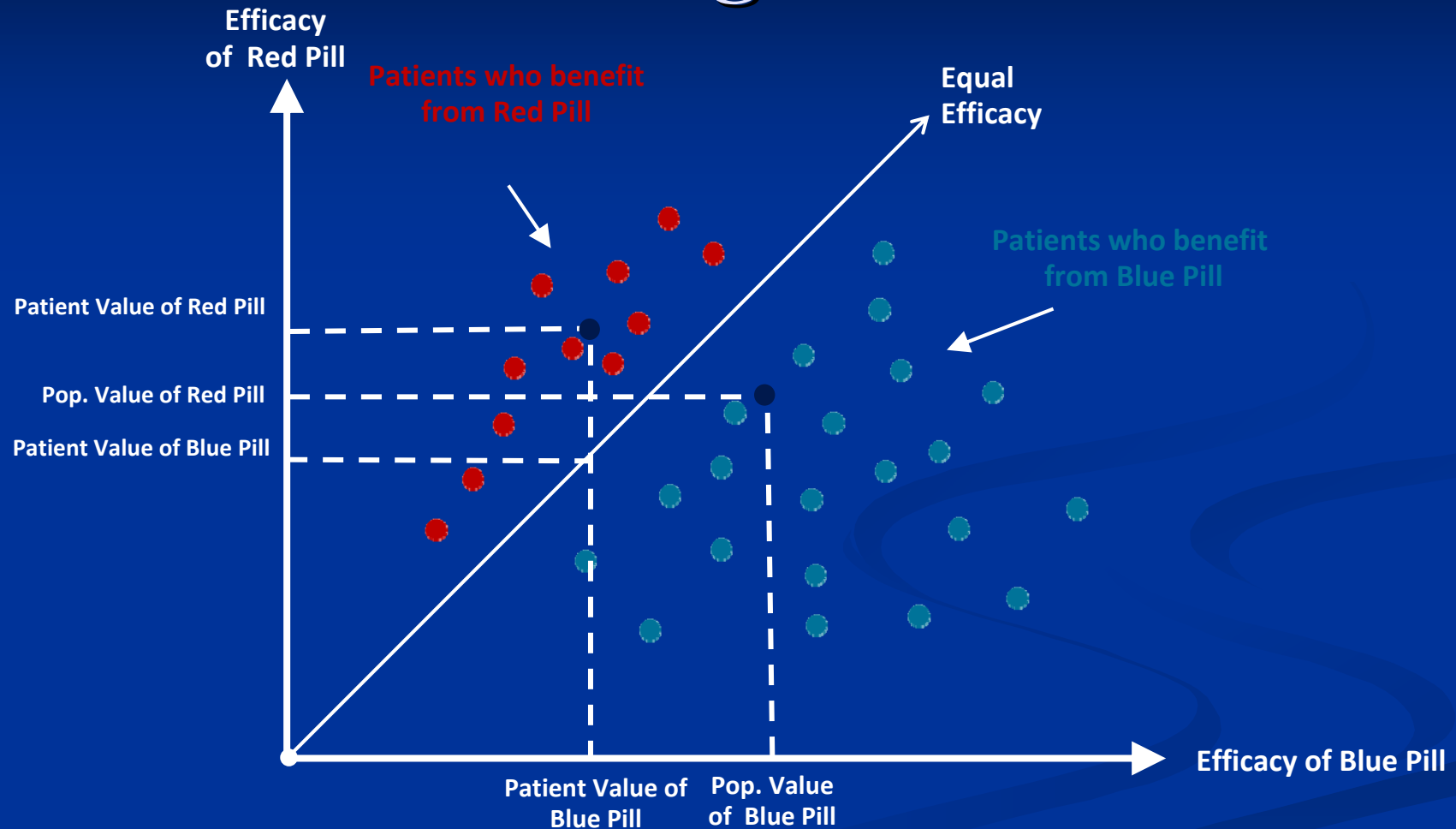
Lower demand for CER losers

Implication: Spending Effects Unclear: Rise in Spending on Winners less than fall in spending on losers

Payer Responses

- Doctor & patients responses versus payers
- Payers will use CER to determine coverage
 - CER winners expanded coverage
 - CER losers reduced coverage
- These payer responses create a ‘multiplier effect’
 - Winners of CER utilized even more
 - Losers of CER utilized even less
- Cost-effectiveness implications of CER unclear

What Happens When Patients Are Heterogeneous?



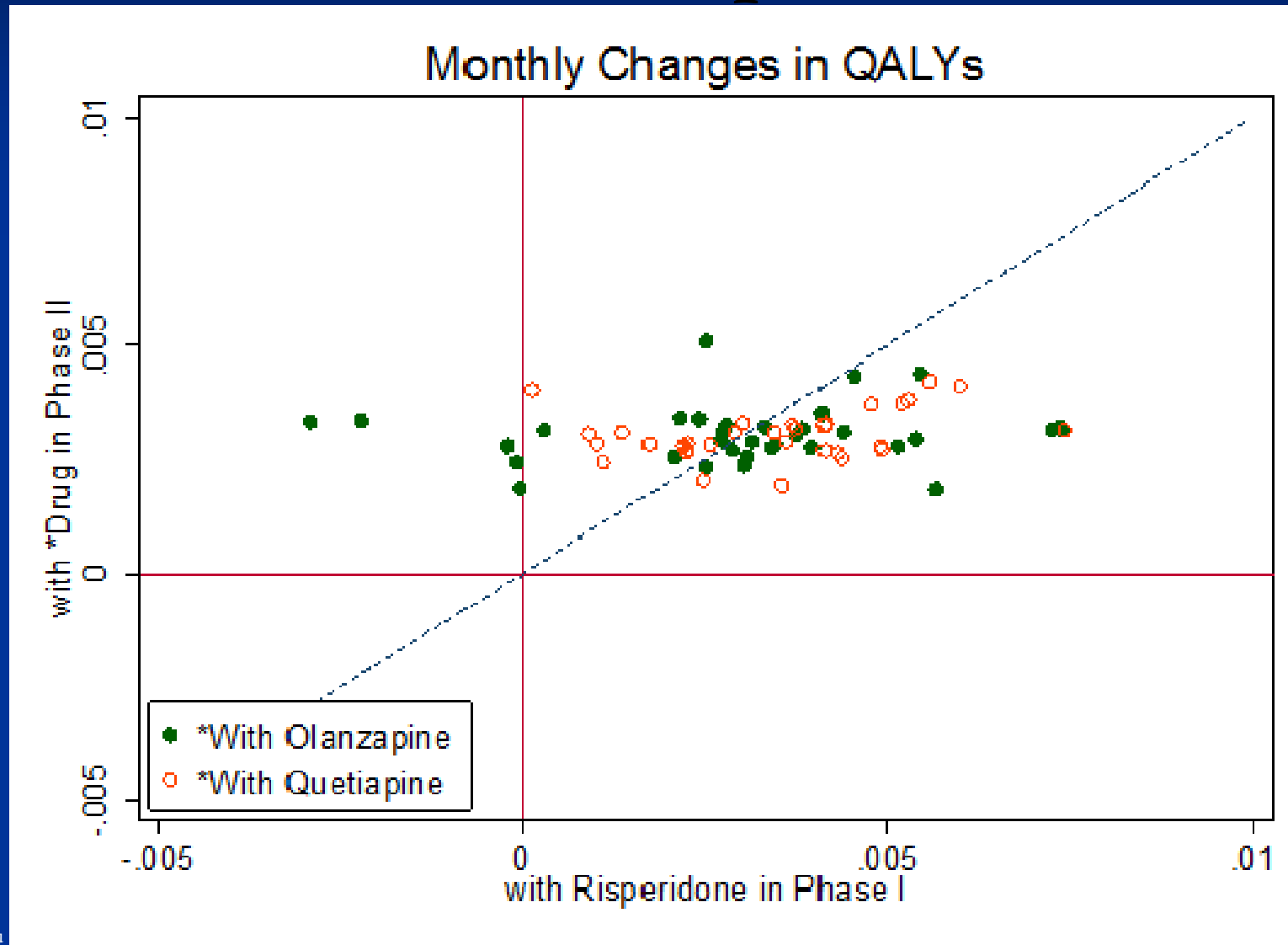
Health and Spending Implications under Heterogeneity

- Patient heterogeneity
 - Payer subsidies are *product-specific*
 - Treatment is *patient-specific*
 - Some patients will benefit more from losers
 - Losers coverage declines
 - Sub-populations may just magnify this problem
- Implications for patient welfare:
 - Indeterminate effects on health outcomes
 - Indeterminate effects on spending
- Cost-effectiveness implications of CER unclear

CER-Responsive Coverage: Medicaid Coverage based on CATIE

- Many argue Medicaid should cover the most cost-effective treatments
 - Issue at hand: more generous coverage for CER winners
- Using CATIE as CER in schizophrenia case:
 - Pay only for first generation antipsychotics in Medicaid
 - 90% reduction Medicaid annual class spending annually (currently \$1.3 billion)
- Problem:
 - Many patients fail first-line typicals but respond to 2nd line atypicals
 - Induces a loss of health valued at 98% of class spending

Heterogeneity: Fail First Line, Respond on Second?



CTA and Wave of the Future: Personalized Medicine

- Experience goods vs inspection goods
- Added-value of learning through Dx vs consumption
 - Oncology vs Allergies or ED
- Better metrics of value of personalized medicine
 - Market expansion vs market contraction
 - \$20B value of Dx for Cox2
- US incentives for medical innovation small through cost-based pricing

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Take Home Messages

- *Take Home #1:* Be explicit rather than implicit if and how you reward innovation
 - More cost-effective care not goal
 - Reference pricing and tragedy of the commons
- *Take Home #2:* Will system work as intended given the incentives it induces?
 - CEA pricing incentives defeats intended purpose
 - CER responses defeats intended purpose
- *Take Home #3:* Incorporate Heterogeneity into Product Evaluation
 - Matching vs Product Rankings

Last Take Home Message

- Are related US Models instructive?
 - Medicare Part D can be role model
 - Premium support rather than central pricing
 - Does not have to compromise solidarity
 - Competition vs central regulation holds down prices
 - Medicaid
 - Swiss style Federal and regional financing structure
 - Value determination in private markets used to set discount for public big buyers-Medicaid discounts

Q&A

- Contact information
 - Tomas Philipson: t-philipson@uchicago.edu