Discussion

Combining Complements:

Theory & Evidence from Cancer Treatment Innovation

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I used Claude to make the first draft of the slides. All silly comments are attributable to me.

Paper Summary

> Cancer combination therapies are highly effective, but combination innovation creates a market expansion externality — innovators raise profits for other firms' component drugs, leading to underinvestment.

Firms under-trial combinations

58% of cancer trials are combinations, but only 47% of firm trials are — firms trial fewer combos than publicly funded researchers

Own-drug bias is extreme

Firms are 11× more likely to trial combinations of their own drugs vs. uniform random; NCI bench tests show no efficacy difference

Generic entry reshuffles incentives

After generic entry: original owner trials ↓59%, other firms ↑42%, publicly funded ↑8% — consistent with market expansion externality

Dix & Lensman (2025)

Paper Summary (cont.)

Quantifying Externalities

Market expansion often dominates business stealing for multi-firm combos

Net profit externality avg. **~$27M/yr** per new combo (>$200M over patent life)

90% of multi-firm combinations have positive net externalities

Policy Counterfactuals

Dynamic model of combination innovation with free-riding

Redirecting public trials toward high-spillover combos minimizes crowd-out

Budget-neutral policies can generate **up to $367M** in welfare gains ($533/patient-year)

Bottom line: Missing property rights for combination therapies → market expansion externalities → firms underinvest. Smart public policy can close the gap.

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This Is a Great Paper

Policy Relevant + Takes Firm Strategy Seriously → Great RQ

Cancer is the #2 cause of death in the US; combination therapies are among the most effective treatments

The paper takes seriously how firms think about R&D portfolio decisions — not just "is there enough innovation" but "what kind, and why"

The framing around missing property rights for combinations is crisp and generates clear, testable predictions

Clear Conceptual Framework Builds Intuition

Stylized model decomposes externalities into three forces: market expansion, business stealing, and consumer surplus spillovers

Clean predictions about firm vs. public trial portfolios, own-drug bias, and generic entry effects

Each prediction maps naturally to an empirical test — the theory does real work organizing the analysis

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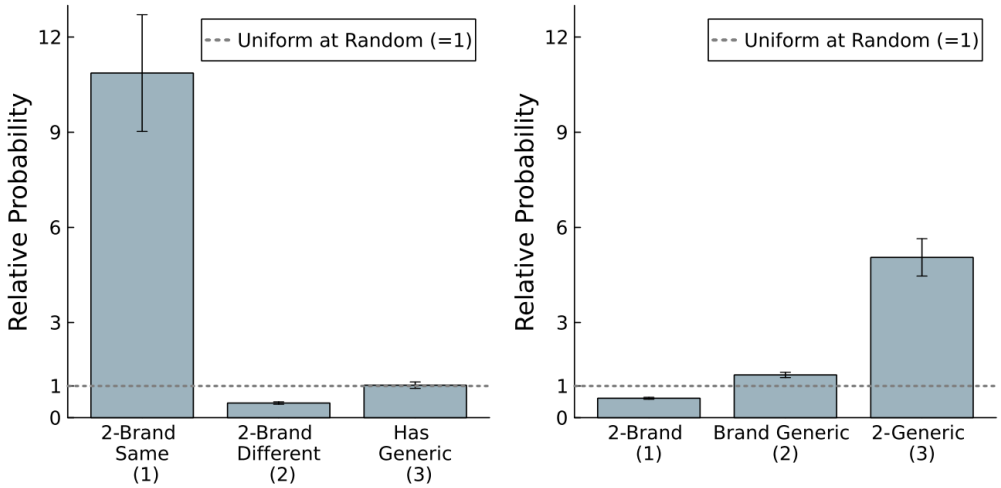
Good Data → Model-Free Descriptive Results

Firms are 11× more likely to trial their own drugs together — financial incentives, not efficacy, drive trial portfolios

Figure 2: Relative Probability of Trialing 2 Drugs Together by Drug Ownership Status



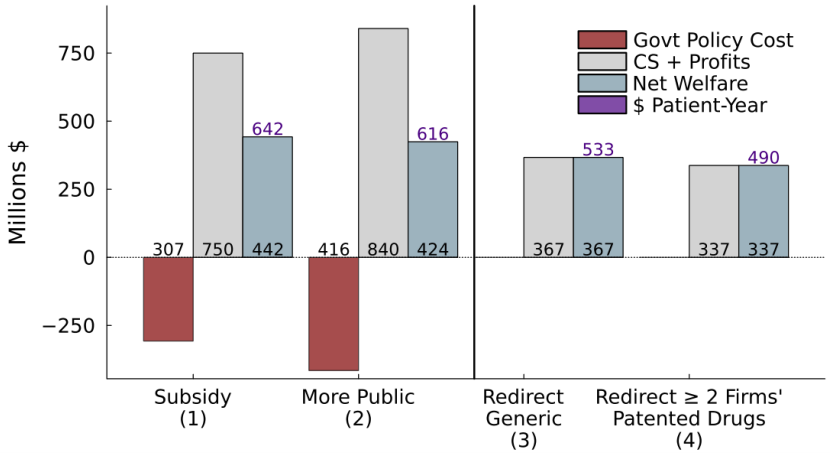
(a) Firm (b) Public

Dix & Lensman (2025) — Figure 2

Careful Modeling → Policy-Relevant Counterfactuals

Redirecting public trials toward high-spillover combinations achieves large welfare gains at minimal cost

Figure 7: Policy Cost and Welfare Gains



Dix & Lensman (2025) — Figure 7

A Few Extensions

Biggest picture

Boundaries of the firm?

M&A and licensing agreements can internalize the market expansion externality.

How does the current structure of ownership endogenously respond to these incentives?

Can firms largely solve this through the market for corporate control?

A natural and important next step!

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… and who captures the rents?

Biggest picture

Boundaries of the firm?

Follow up question: who owns the truly scarce resource/asset? How does this affect innovation incentives?

- … if biotechs want to be acquired anyway ….
- … but, ideally, want multiple bidders …

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A Few Extensions

Getting more from the model

What is the implied trial elasticity?

It might be useful to report an implied elasticity of private trials with respect to policy.

This would help benchmark against other innovation policy contexts and clarify how responsive the margin is.

For example: a 10% subsidy produces X% more [private] combination trials — how does this compare to R&D tax credit elasticities in other settings?

Would sharpen the policy punchline and make it easier for policymakers to compare instruments.

A Few Extensions

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Most in the weeds

What about more other channels for innovation?

Can we *partly* mitigate the underinvestment problem by revealing combinations worth trialing?

- Claude made these slides … can “he” pre-screen combos?
- Off-label prescribing lets physicians use drugs in unapproved combinations without formal trials.

Connects to broader questions about the direction of innovation — e.g., Budish et al. et al.

How much informal experimentation happens before (or instead of) formal trials?

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A Great Paper

Policy-relevant question in a first-order market

Sharp theory that organizes compelling descriptive evidence

Careful structural model with actionable counterfactuals

Excited to see where Rebekah heads next.