

Innovation in Agriculture: Impact Evaluation and Program Design

Christopher Udry

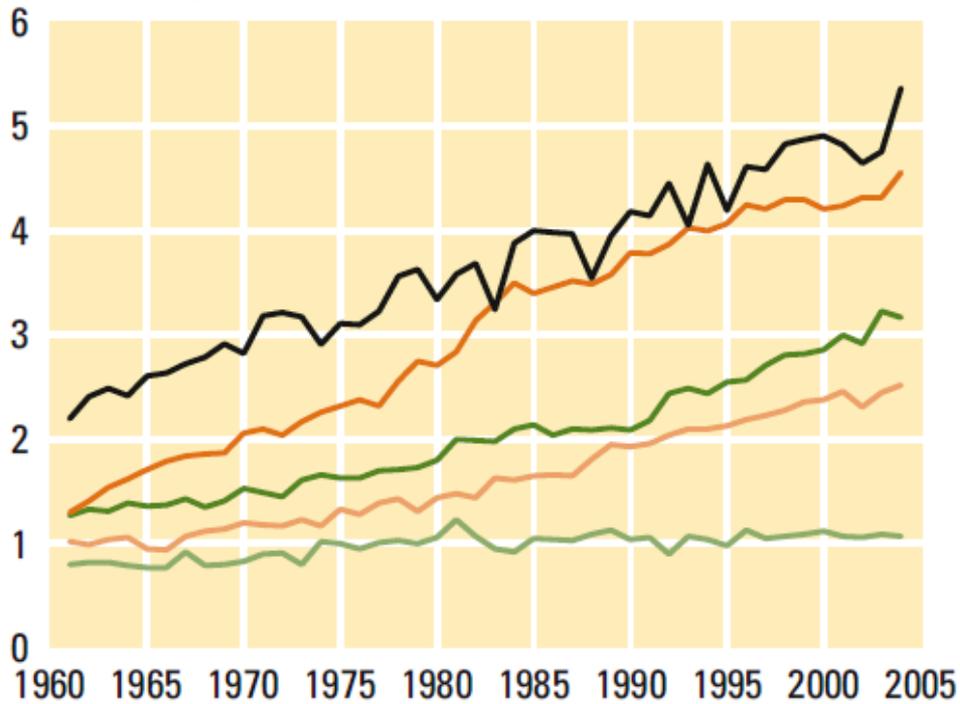
Yale University

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Poor agricultural performance is the (un)productive foundation of rural poverty

Yield, tons per hectare



— Developed countries — South Asia
— East Asia & Pacific — Sub-Saharan Africa
— Latin America & Caribbean

Slow innovation due to low profits

- Climate, Soil
- Price scissors
 - Poor infrastructure; roads, power, public irrigation
 - Price, tax, trade, trucking policies
 - Market chains, information
- Temperate bias of agriculture research

Strong evidence of rapid adoption when profitability is high

But... many examples like this

Impact of organic and inorganic fertilizer on in Ghana's Northern Region (2010)			
Treatment	Maize Yield (kg/ha)	Added cost (cedis/ha)	Added Profit (cedis/ha)
Control	450	0	0
NPK + Ammonia	2210	200	516
Commercial OF + N	3274	408	733
Commercial OF +NPK	3160	380	717

Source: AGRA Soil Health Project

This doubles net farm income.

What are the barriers to adoption?

IE: What Works, and Why

- Interventions designed to address barriers to adoption (e.g., MCC Ghana ag program)
- Multiple barriers, with multiple interventions.
- Randomized control trial eases interpretation (“treatment” vs. “control” randomly assigned)
- This context: Presbyterian Agricultural Services and Innovations for Poverty Action

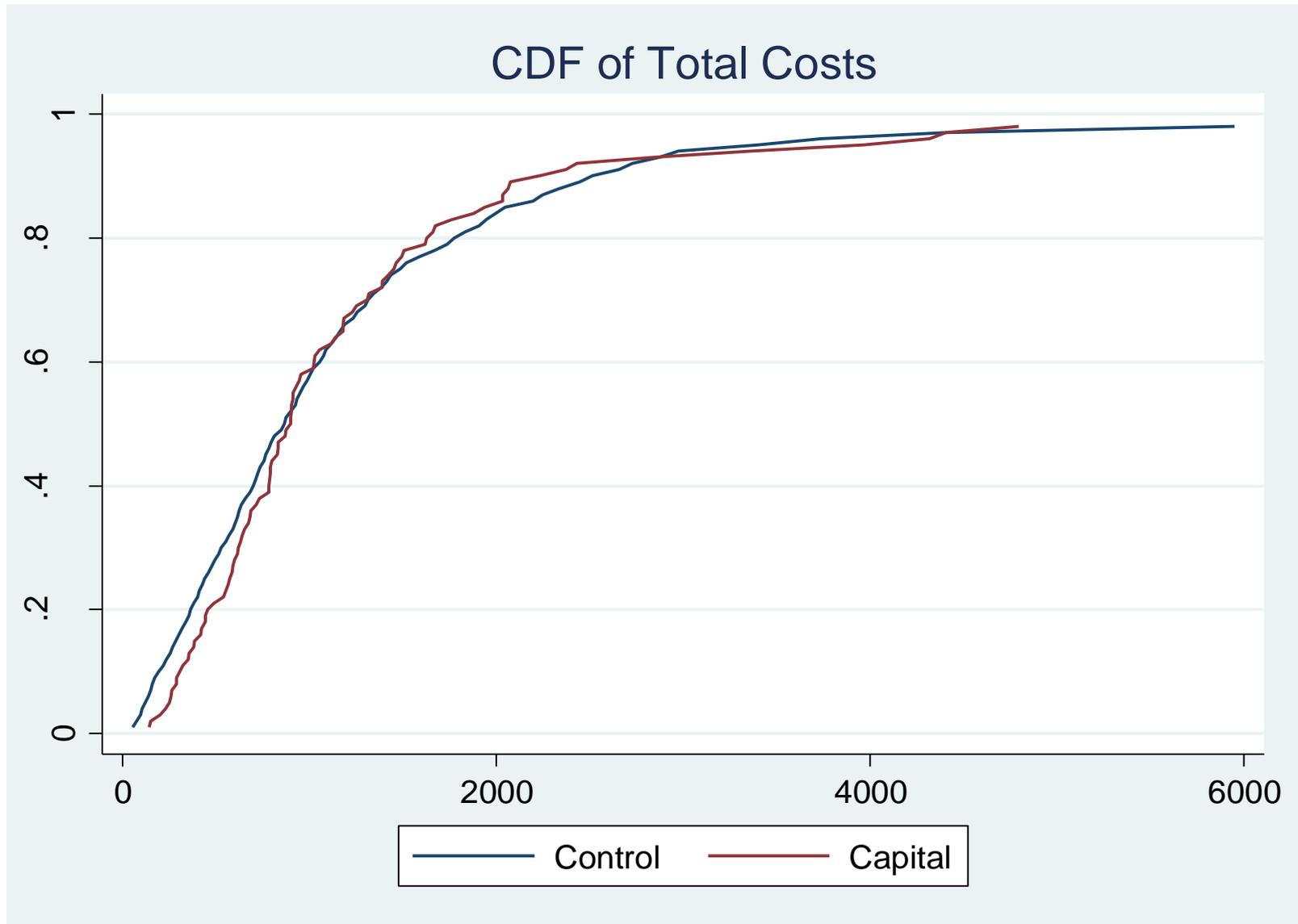
1. Credit constraints

- Universally claimed as important
- Evaluation:
 - Provide capital grants (akin to starter packs) to a random sample of farmers

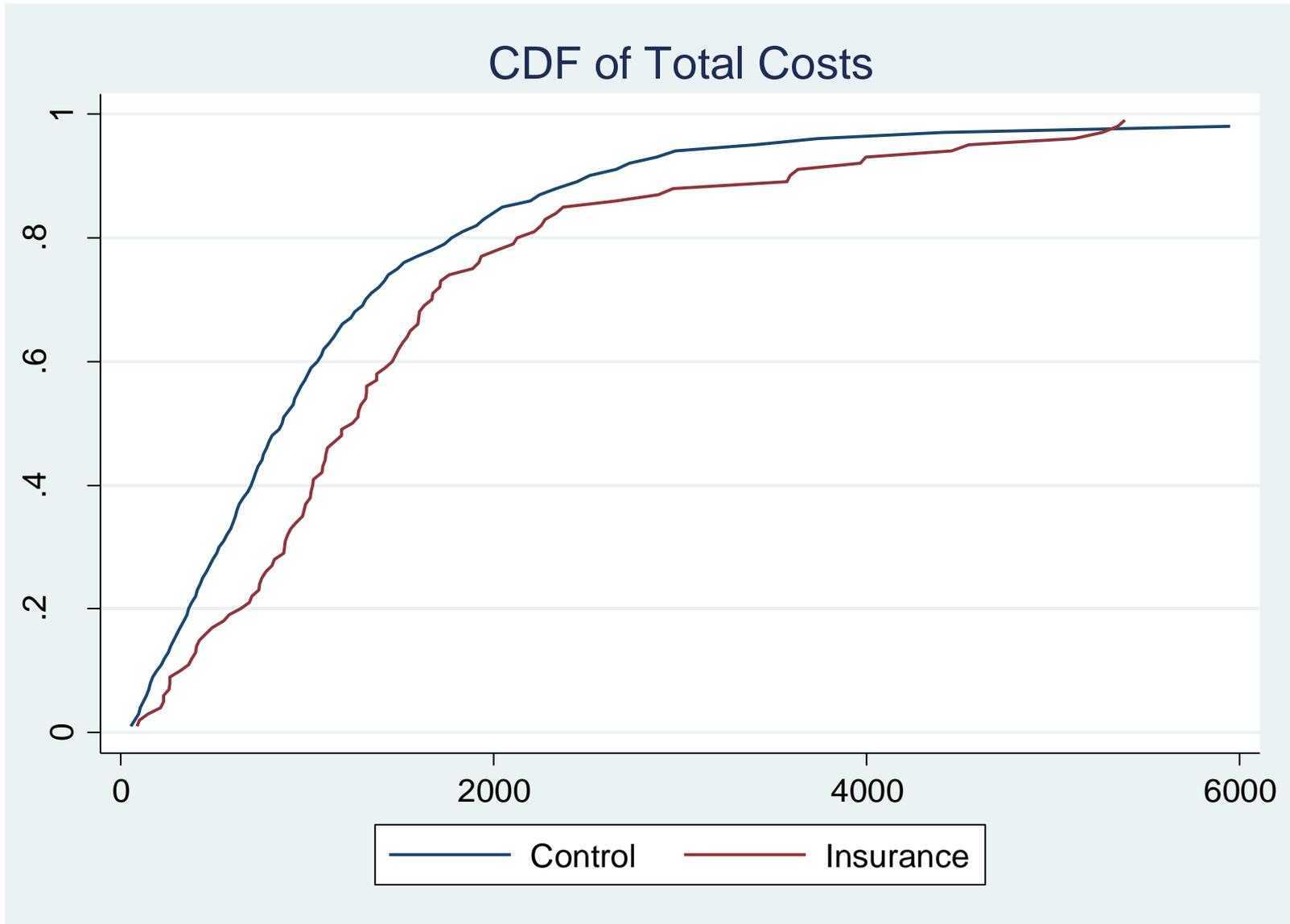
2. Risk

- These certainly increase risk
- Farmers acknowledge this risk in focus groups
- Evaluation:
 - Provide rainfall index insurance to a random sample of farmers

Do credit constraints bind?



Does uninsured risk bind?



Evaluation and Program Design

- Development interventions are aimed to overcome barriers
- Evaluation can tell us about these barriers
- In the example, capital constraints didn't bind; uninsured risk did
 - Focus evolution of program around risk
 - Commercial distribution of rainfall index insurance in northern Ghana now reality

Other barriers matter in other contexts

- Externalities/Public goods
 - Extension systems
 - Social learning
 - Coordination failures/minimum scale
- Land tenure
- Labor markets
- Complementary inputs

Systematic Testing: IE Improves Program Design

- What innovations are potentially profitable?
- What are the constraints?
- How can they be relaxed?
- Test, Measure, Scale

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- Agricultural Technology Adoption Initiative

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