

Social Learning among Urban Manufacturing Firms: Energy-Efficient Motors in Bangladesh

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Overview

■ Research target:

Estimate knowledge spillovers among firms in the adoption of energy-efficient technologies

■ What the Paper Does:

(1) **Setting**: RCT with 505 leather/footwear firms in Dhaka, Bangladesh.

(2) **Technology**: Servo motor \Rightarrow reduces electricity use by 71%, swaps onto existing machines in 20 minutes, costs \$46.

(3) **Design & Approach**:

Treatment Arms

- ▷ **T1**: 5-min informational video
- ▷ **T2**: Video + (almost) free servo + dual meters + monthly reports
- ▷ **Control**: No intervention

Econometric Innovation

- ▷ Borusyak & Hull (2023) re-centering
- ▷ Actual - expected exposure identifies spillovers

Main Findings at a Glance

Finding	Magnitude	My Read
T1 (video) → adoption	+9.9 pp	Info barriers real To be discussed
Local exposure to T2 (<500m) → adoption	+16–19 pp	Core result; very large
Exposure → discussed servos w/ T2	+22.4 pp	Clear information flows
Exposure → beliefs / WTP	≈ 0, n.s.	To be discussed
Same-product exposure stronger	Yes	Learning/Signaling/Heuristics?
Network / supplier / mosque channels	≈ 0, n.s.	Geography dominates
MVPF (with spillovers + climate)	5.14	Impressive if robust

Lots to Like

- First-order question, first-of-its-kind evidence: urban manufacturing knowledge spillovers are central to agglomeration theory.
- Direct observation of the technology beyond TFP-residual approaches, and interference is addressed directly.
 - ▷ BH recentering: Actual - expected exposure identifies spillovers
 - ▷ Using BDM price distributions to implement randomization minimizes Hawthorne effects.
- Rich outcomes: adoption, beliefs, WTP, firm-level performance
- Rich mechanism evidence chain: Adoption → information exchange → product-type matching → welfare.
 - ▷ Product-type matching: shoe firms learn more from shoe firms
- Connecting spillovers to MVPF is exactly what policymakers need for green technology subsidies.

What I Would Like to Ask

The paper is already strong. My comments mainly ask for further clarifications.

- Comment 1: Why don't beliefs move? Is this "learning" or broader social transmission?
- Comment 2: Why T1 is not that effective?
- Comment 3: Distribution and variation of exposure
- Comment 4: Adoption overtime and further investigation for high control adoption

Comment 1: Learning vs Signaling/Heuristics (Most Interesting Part)

- Exposure → **strong** adoption spillovers (+19 pp) but Exposure → \approx **zero** effect on beliefs and WTP
 - ▷ If firms are truly *learning* (Bayesian updating on technology parameters), beliefs should move.
 - ▷ Seeing is believing: what do they see and believe
- Alternative mechanisms: Rule-of-thumb substitution/ Heuristic, Imitation/Herding, Salience, Demonstration
 - ▷ Heuristic: Firms adopt based on "it seems to work" not "I've calculated the return"
 - ▷ Seeing a neighbor use a servo motor is a credible signal about quality/reliability: Neighbor bought one, so should I
 - ▷ Demonstration: Reduces perceived risk of trying something new
 - ▷ Competitive pressure: Strategic, not externality

Comment 1 Cont'd: Further Policy Implications

Suggestions

- Post-adoption usage intensity / satisfaction (herders may revert)
- Heterogeneity by market overlap among same-product firms (competition vs. learning)
- Follow-up phone survey on adoption-reason (cost saving / peer pressure/ technician advice...)

Mechanism	Policy Implication
Knowledge learning	Info campaigns + training can sustain diffusion
Imitation/Heuristic Competitive pressure	Optimal policy = visibility & No market failure; firms will adopt on their own
Quality concern/risk	demonstration and peer's success (Wolitzky, 2018 AER)

Comment 2: Why T1 is not that effective

- A five-minute video conveys substantial information: the new technology itself, its electricity-saving benefits, the ease of motor replacement, and a demonstration of the replacement procedure.
 - ▷ Do firms distrust the video, or discount the information it provides?
 - ▷ Do firms watch the video attentively and actually retain the information presented?
 - ▷ If so, what specific knowledge do they acquire from watching the video?
- If there are some survey questions on this: 1) general knowledge index, knowledge on each dimension of the technology.

Comment 2 Cont'd: T1 and Exposure

- Or T1 firms may have learned from the video but still required a demonstration before adopting.
 - ▷ An interaction term $T1 \times \text{Exposure}$
 - ▷ Test whether T1 firms with a T2 neighbor adopt at a higher rate
 - ▷ whether prior information and local demonstration are complements rather than substitutes.
- The results for the midline and endline can help better understand how the effects evolve over time, whether they dissipate, grow or stay consistent.

Comment 3: Distribution and Variation of Exposure

- The main independent variable of interest is geographic exposure.
- What is the distribution of exposure across firms?
- In denser clusters, how many firms actually have zero exposure?
- BH assumption: random treatment assignment generates exogenous variation in exposure. But firms in denser or more central neighborhoods may still differ systematically from those in more peripheral ones in unobserved ways.
- Is there baseline balance in exposure across firm characteristics?

Comment 4: Investigation for High Control Adoption

By endline, 40% of control firms had adopted servo motors.

■ Three Possible Explanations

- ▷ Spillovers from neighboring T2 firms
- ▷ Ongoing market-wide diffusion trend
- ▷ Salience effect: repeated survey questions about servo motors may have raised awareness independently

■ Potential Confounders

- ▷ Figure 7: WTP converges to market price across *all* groups, including the pure control group
- ▷ Repeatedly asking "How much electricity does a servo motor save?" may itself constitute an informational intervention by increasing salience

■ Suggestions

- ▷ 1. Data on adoption among comparable Dhaka firms *not* in the sample
- ▷ Check if their adoption rate is substantially lower than that of the control group.
- ▷ 2. Adoption pattern of a pure control group in a non-study area

Other Questions

- Motivation and framework from Wolitzky (2018, *AER*) on cost-reducing technology: Information barely work, the share of peers who have already adopted works.
- Could the initially low adoption rate be driven by the absence of maintenance and repair market for servo motors (rational choice)?
- Sensitivity for MVPF parameters:
 - ▷ Discount rate
 - ▷ 2nd-order spillover rate (meters vs no meters)
 - ▷ general equilibrium
 - ▷ Rebound effect?
- On the Network Null Results:
How correlated is geographic exposure with the other three network measures, communication networks, shared supplier channels, and same mosque attendance?

Thank You

I really enjoyed reading the paper!
Look forward to the next version!