

CoCoCo: Cooperation-Competition-Coordination

Shisham Adhikari (UC Davis)

June 14, 2024

Motivation: Technological Innovation for Climate Change

- Technological innovation must shift towards clean energy to tackle climate challenges.
- Key determinants of direction of technology:
 - ▶ Unpriced externalities
 - ▶ Varying markups
 - ▶ Heterogeneous ideologies
 - ▶ Social considerations like inequality
 - ▶ Coordination failures (underexplored)
- Existing literature addresses the first two extensively.
- Role of coordination failure in direction of technological innovation is mostly unexplored.

Research Question and Proposal

Question: How does coordination failure influences the direction of technological innovation?

Proposal: Extend the directed technological change framework (Acemoglu, 1998, 2002) to write a macroeconomic framework to model and measure how coordination influences technological direction.

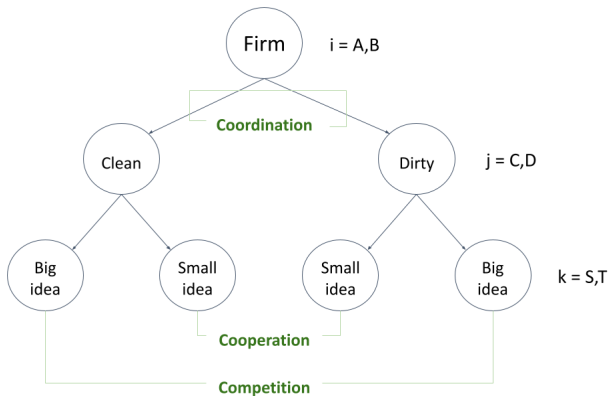
Step-by-step: Here's what I have in mind:

1. Pin down the underlying game theoretical model with Co-Co-Co mechanisms.
2. Embed the game-theoretical model into Acemoglu's framework on directed technological change.
3. *Quant 1:* Calibrate the model and counterfactuals.
4. *Quant 2:* Use applied micro data to quantitatively assess how coordination (or lack of) affects direction of technical change.

CoCoCo: Cooperation, Competition, and Coordination

- **Cooperation:** Firms contribute to foundational knowledge (small ideas), benefitting all players.
- **Competition:** Firms race to achieve breakthrough innovations (big ideas) with winner-takes-all rewards.
- **Coordination:** Firms need to coordinate which sector or technology to invest and innovate in.

CoCoCo: Cooperation, Competition, and Coordination



Literature review

- Directed Technological Change: Acemoglu (1998); Acemoglu and Zilibotti (2001); Acemoglu et al. (2012); Hémous (2016); Acemoglu and Restrepo (2018, 2022);
 - ▶ Unpriced externalities: Popp (2002); Acemoglu (2012); Aghion et al. (2016); Acemoglu et al. (2019)
 - ▶ Markup differences: Budish, Roin, and Williams (2015)
 - ▶ Heterogeneous ideologies: Restrepo (2020b); Acemoglu and Johnson (2023)
 - ▶ Coordination failures: Acemoglu and Lensman (2023)