

WTIC Discussion – Organizational Implications of AI

Costly Adjustments and Complementary Investments

Papers by: Lane et al., Nagle et al., and McElheran et al.

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Three well-executed studies

- All three papers feature thoughtful research designs, conducted “in the field”.
- We get to see effects at three levels. Cool!
 - Organization
 - Task
 - Decision

These studies cover substantial ground

- AI Across Three Levels of Analysis
 - Organization, Process, Decision-Making
- AI Across Different sectors
 - Manufacturing, Valuing Innovation, Software Development
- AI Across Over Time
 - Pre 2021 ... June 2022 ... Spring 2024
- AI Across Varieties
 - General vs narrow, Predictive vs Generative

Central idea: AI and co-investment

- The central theme is that realizing the benefits of AI adoption is **not immediate or automatic**.
- These contexts require significant **adjustments** to integrate the technology into existing decision-making and work processes and organizations.

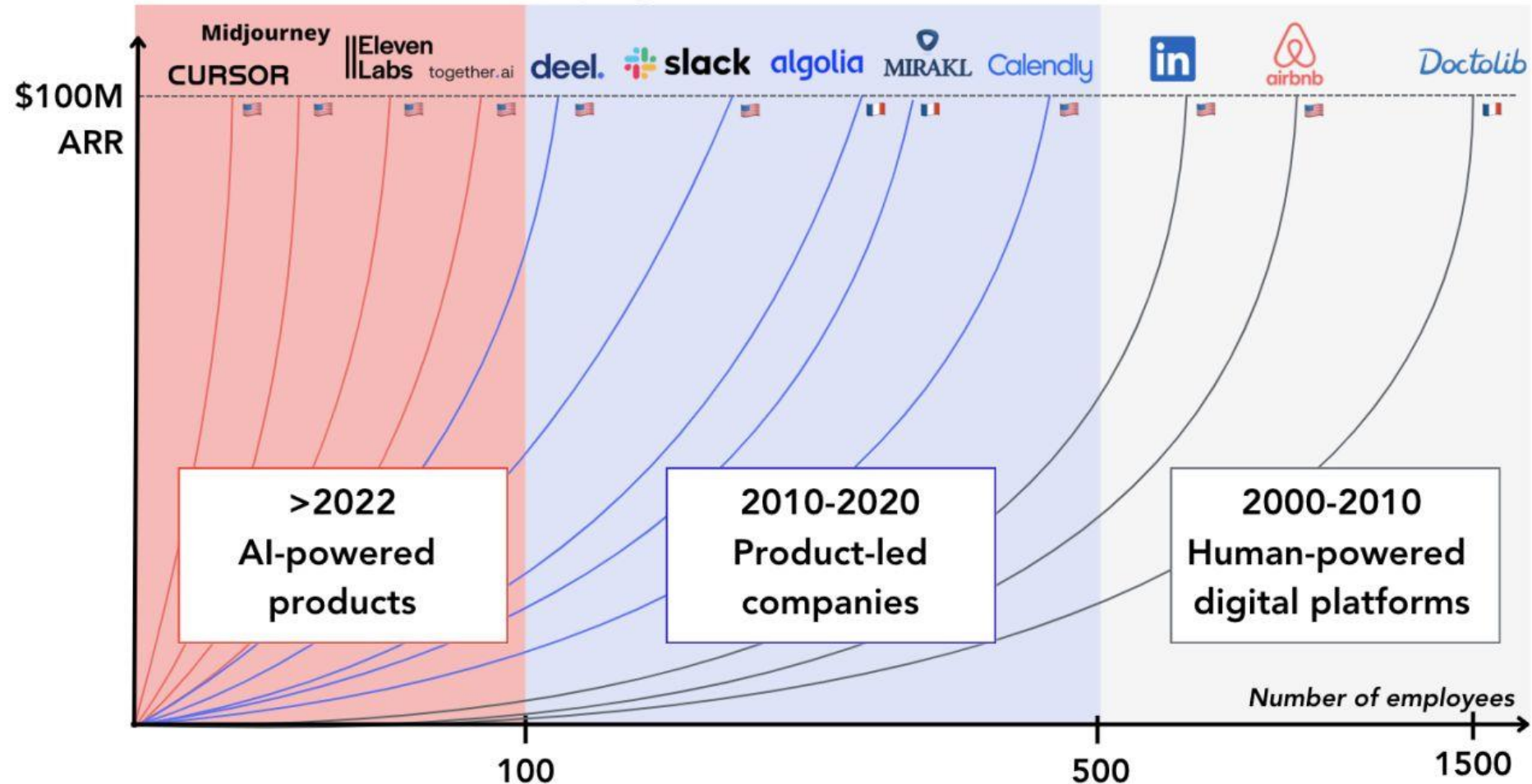
The story ...

- AI reduces cognitive effort in tasks like screening (or coding).
- Lowers the “costs” of core work.
- Individuals re-optimize their limited cognitive resources
- Shifts in task allocation:
 - Focus on core activities.
 - Increased deference to AI.

... which translates to ...

- Firms optimize demand for labor and capital inputs.
- Requires complementary investments in work:
 - Process redesign.
 - Worker training.
- Which take time to implement, generating a “Productivity J-curve”, concentrated in older firms

Employees to reach \$100M ARR



Sources: Personal database aggregating and enriching funding round data from Crunchbase, eCap, and Dealroom.
Press & Companies' websites. Assuming linear growth of employees

Three high-level areas of suggestions

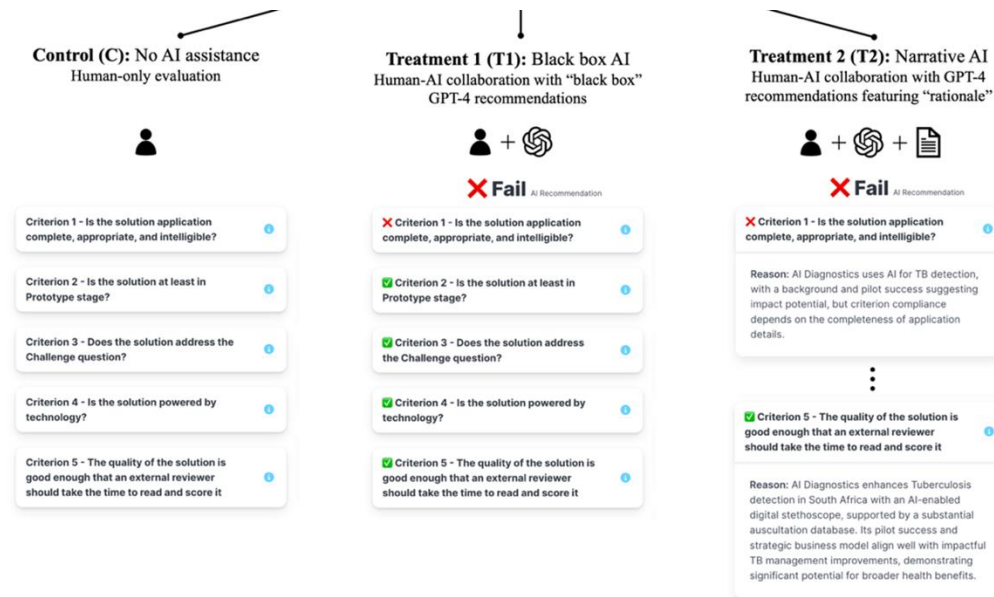
- The role of AI in the treatment
- Interpreting the DV
- Market interpretations

Questions about the “right” side of the equation.

What is the role of AI? What is the control?

Lane et al

- What should our view be of the role of “AI” in this setting?
- AI assistant vs algorithmic recs vs human assistants ...



Nagle et al

- How should we think about what Github Copilot is doing?

```
public static List<List<String>> readXlsx(InputStream inputStream) throws Exception {
    List<List<String>> result = new ArrayList<List<String>>();
    Workbook workbook = new HSSFWorkbook(inputStream);
    Sheet sheet = workbook.getSheetAt(0);

    for (int i = 1; i < sheet.getRowCount(); i++) {
        List<String> row = new ArrayList<String>();
        for (int j = 0; j < sheet.getRow(i).getCellCount(); j++) {
            row.add(sheet.getRow(i).getCell(j).getStringCellValue());
        }
        result.add(row);
    }

    return result;
}
```

McElheran et al

Key Difference:

- **Predictive analytics is a business process that may use supervised AI as a tool.**
- **Supervised AI is a technique; predictive analytics is an application domain.**
- Think of supervised AI as a hammer, and predictive analytics as one of the many jobs you can do with it.
- The definition of AI was literally hard to find 😊

Questions about the “left” side of the equation.

Lane et al

I like the off-diagonal analyses

Lane et al

I like the off-diagonal analyses, but how should I think about alignment?

Lane et al

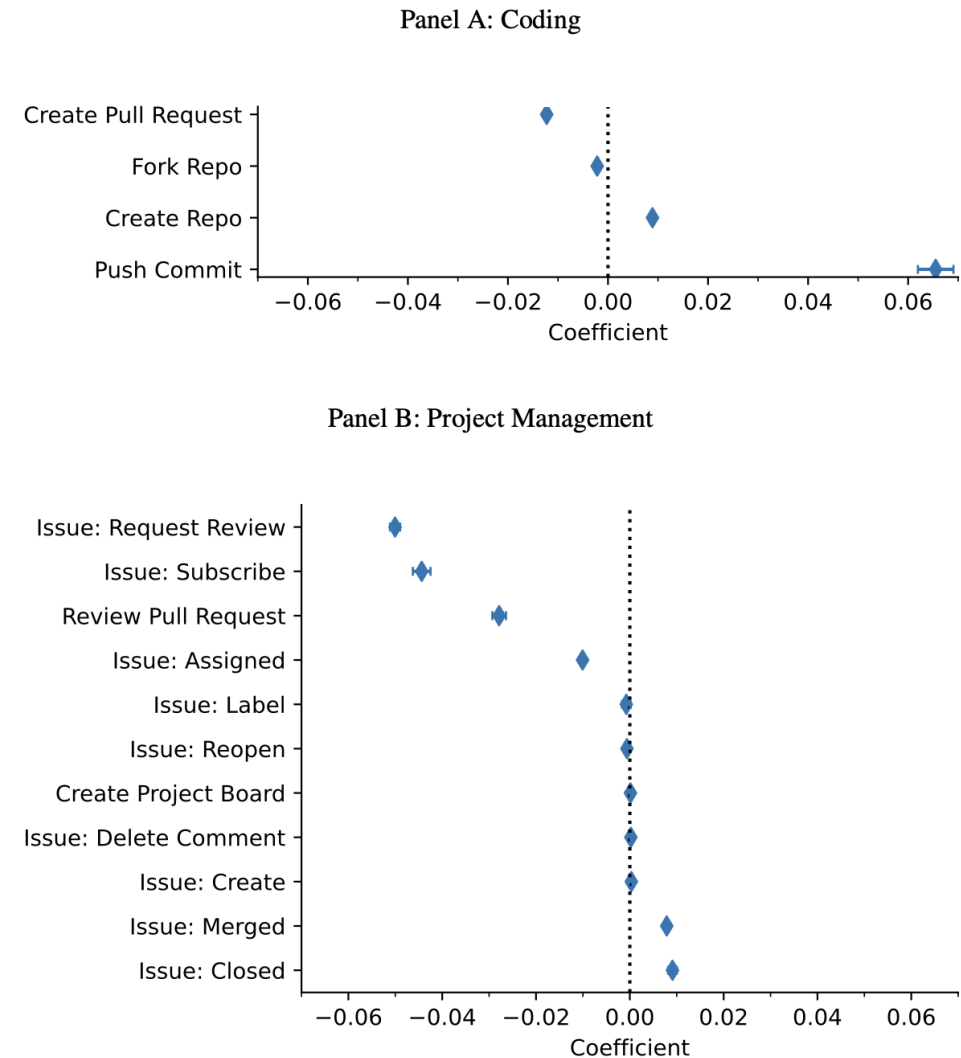


I like the off-diagonal analyses, but how should I think about alignment?

Nagle et al

1. Copilot makes it easier for novice developers to generate code without asking for help.

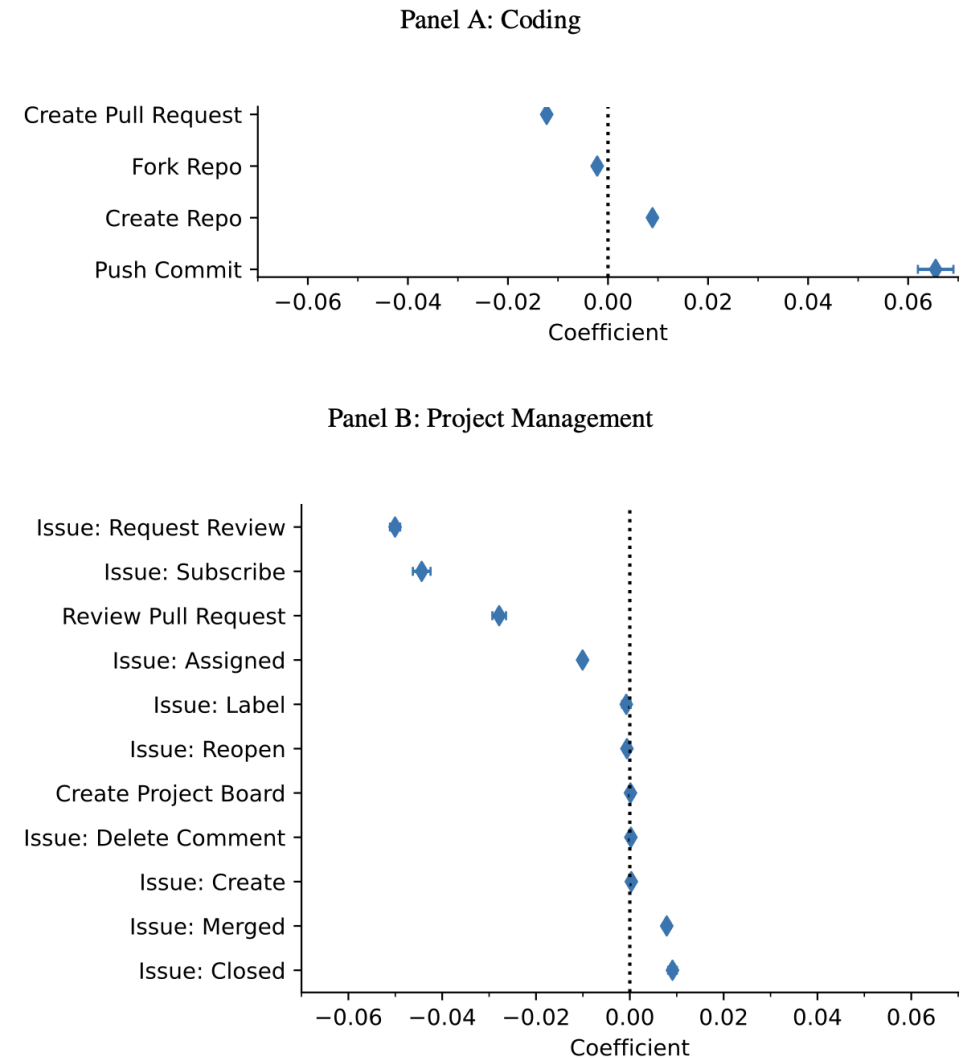
Figure 5: GRANULAR INTENT-TO-TREAT EFFECTS OF COPILOT



Nagle et al

1. Copilot makes it easier for novice developers to generate code without asking for help.
2. Is this more like reducing rework. A bit uncomfortable with “code” vs. “project mgmt” or “core” vs. non-core.
3. Are they “reallocating their efforts ...”

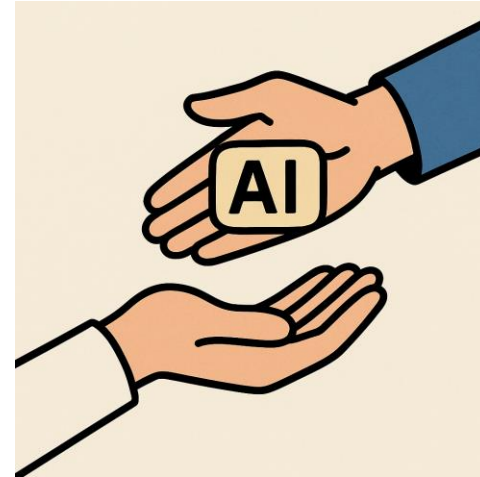
Figure 5: GRANULAR INTENT-TO-TREAT EFFECTS OF COPILOT



The role of the market

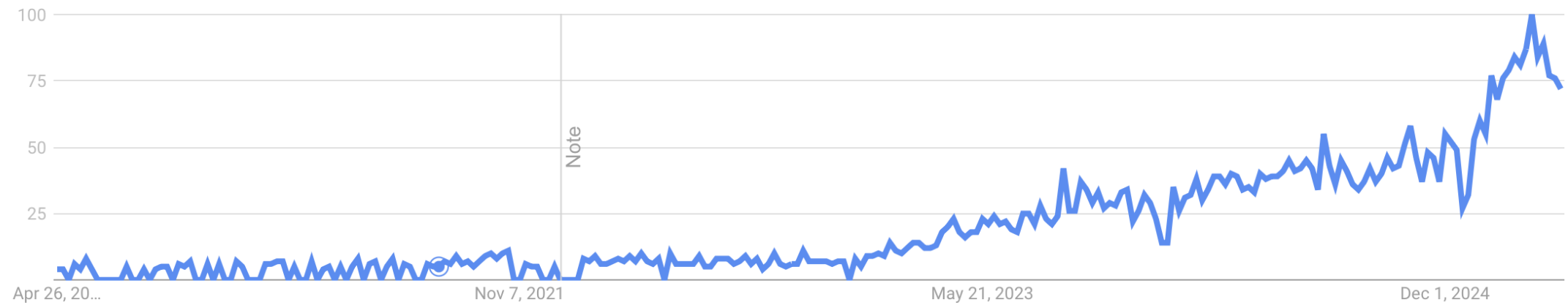
McElheran et al (demand)

- What does it mean to “use AI”?
- Predictive Models:
 - Firm-specific investments
 - Effectiveness tied to data quality
 - Accounting software offers generic productivity gains across firm, but AI can generate advantages based on operations, customers, processes, decisions
- How should I think about the input market for AI?



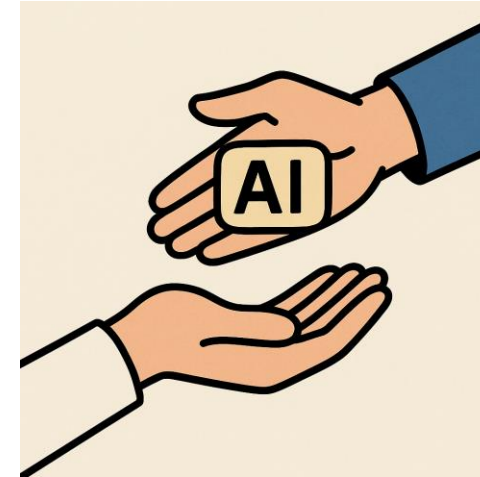
McElheran et al

“Enterprise AI”



McElheran et al (demand)

- What does it mean to “use AI”?
- Predictive Models:
 - Firm-specific investments
 - Effectiveness tied to data quality
 - Accounting software offers generic productivity gains across firm, but AI can generate advantages based on operations, customers, processes, decisions
- Generative Models:
 - Models are general. Value generation is firm-specific.
 - Integration relies on organizational context



Nagle and Lane (supply)

- Price is zero or low. But, long-term feedback loops modulate the market for these inputs.
- Organizational adjustments influence individual behavior
 - Changes in workflows, training, or incentives.
- This has an impact on individual supply of effort and judgment.
- Aggregate effects shape organizational ability to:
 - Achieve sustained increases in supply.
 - Adapt demand for different skills and labor.
 - Navigate the J-curve.

Key takeaway: Heterogenous adjustment paths for firms and workers.

- AI necessitates complementary investments in organization, processes, human capital, and managing human-AI interaction.
- The adjustment paths and costs are heterogeneous, depending on firm characteristics, worker skills, and specific contexts.
 - McElheran et al show older firms experience greater initial losses, implying different adjustment challenges.
 - Lane et al, Nagle et al explore heterogeneity by proxies for ability, implying adjustment might differ based on existing skills.
- The cost of adjustment is not uniform and may require context-specific strategies and investments.

Thank you! ... for the opportunity to discuss
these terrific papers.

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