AI, Skill, and Productivity:

Lessons from a Japanese Experiment

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Impact of AI on Productivity

- How does AI affect productivity?
- How does the effect differ by skill level?
- Past tech (IT/ICT) improves productivity of the high-skilled *more.* Same with AI?

Our Experiment: AI Navi

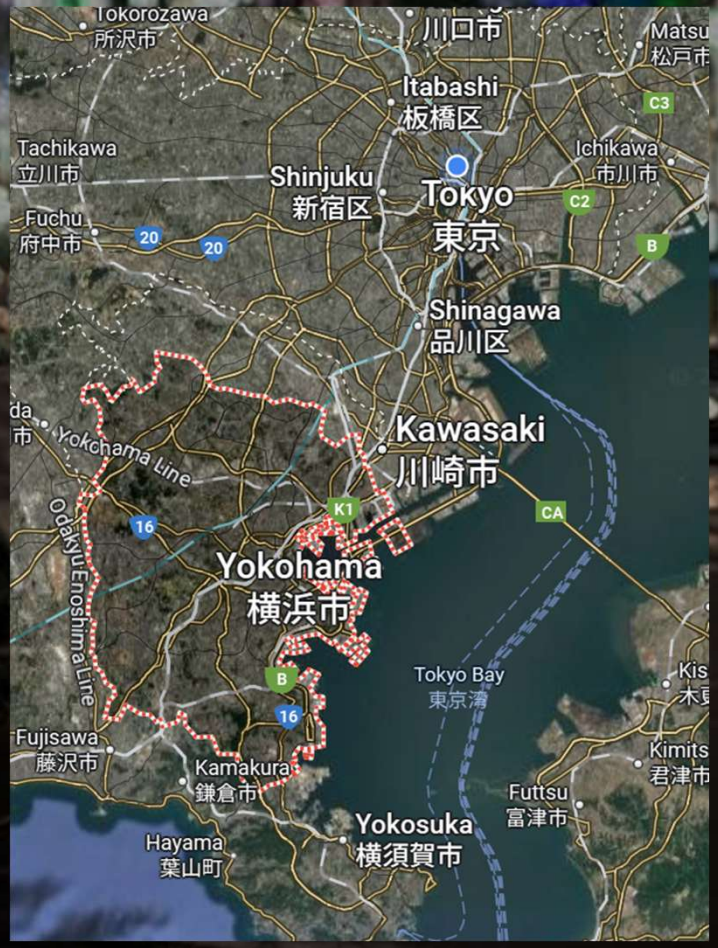
- AI Navi suggests routes based on demand forecast
- It can help find customers and reduce cruse time
- Drivers can turn it “on” and “off”
  - AI adoption was voluntary—some reluctance

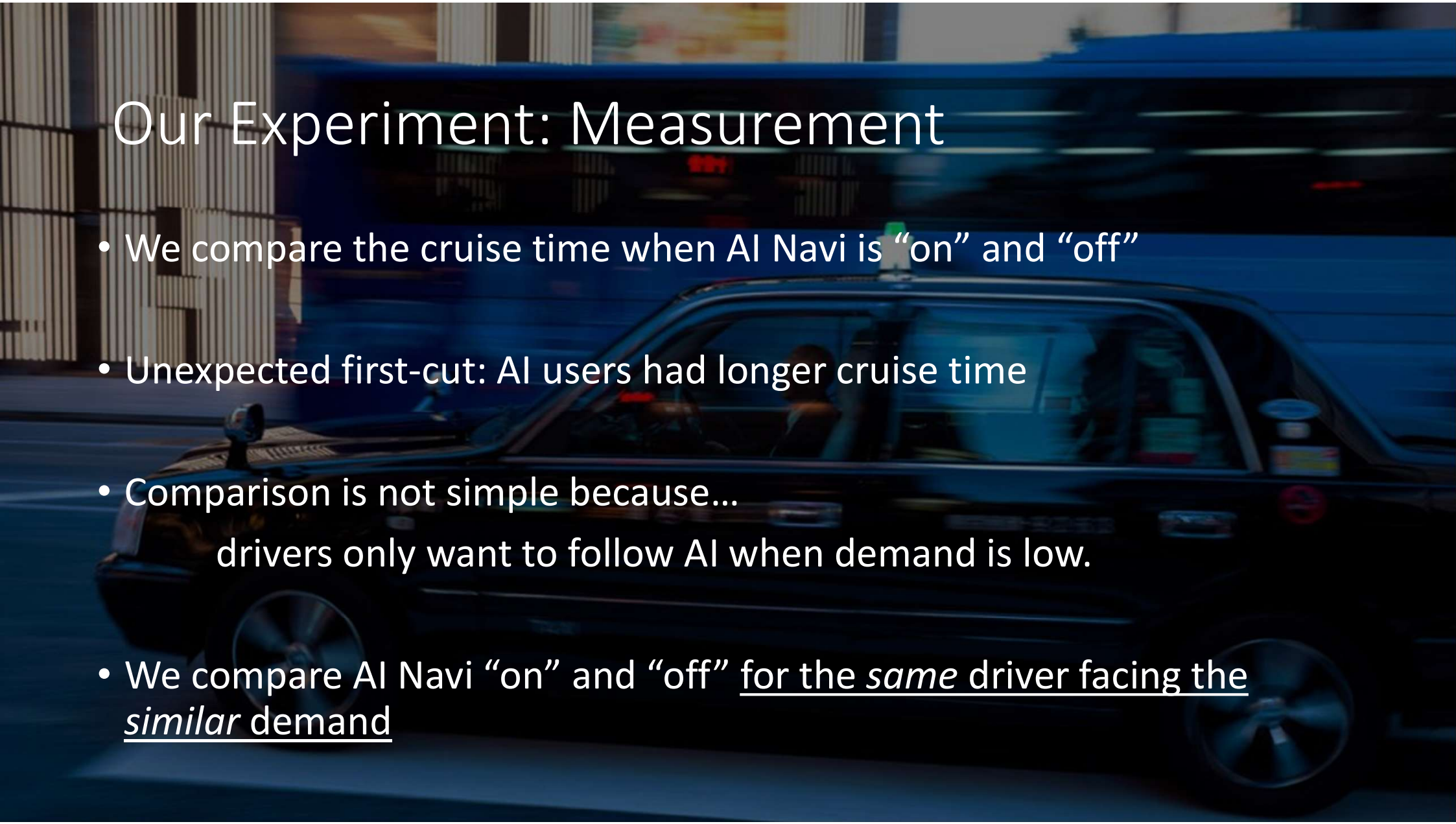
Our Experiment: Setup

- 520 taxi drivers in Yokohama in Dec 2019, 25,000+ trips, minute-level usage data

- Taxi is a nice setup to measure productivity
  - Use almost the same capital
  - No team members

- Detailed driving record
  - This allows us to have driver's skill levels





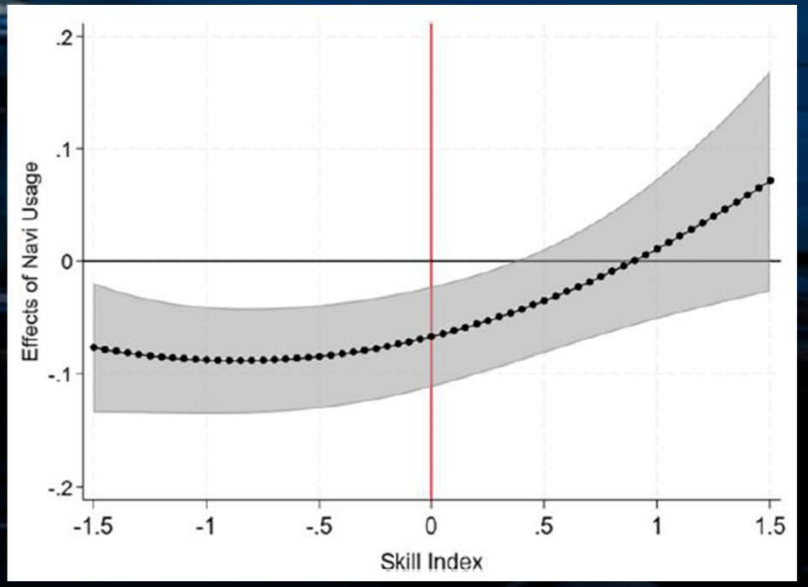
Our Experiment: Measurement

- We compare the cruise time when AI Navi is “on” and “off”
- Unexpected first-cut: AI users had longer cruise time
- Comparison is not simple because…

  drivers only want to follow AI when demand is low.
- We compare AI Navi “on” and “off” for the *same* driver facing the *similar* demand

Our Experiment: Results

- Overall, AI reduced cruise time by 5 %
- This improvement was driven by low-skilled drivers
  - No impact on high skill drivers
  - 8% impact to low skill drivers
- Productivity gap narrowed by 13%
- Exact opposite of past tech (IT/ICT): AI improves productivity of the low-skilled *more.*



Lessons: Human Resources

Hiring

- Broaden pool to less-experienced workers, possibly at lower cost
- Re-prioritize skills that are complementary to AI (e.g., social skills)

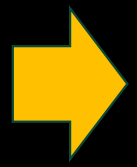
Training

- Shift training to skills that AI cannot support
- Invest in retraining & reskilling for AI-resistant competencies

Lessons: Strategy and Organization

Productivity variance falls

- AI compresses skill gaps
- Fewer extreme performers



Lower monitoring costs

- Easier to manage workforce with more predictable output

Implications

- AI adoption enables shift from commission-based pay toward direct employment models

Lessons: Strategy and Organization

AI opens path to new structures

- Potential shift toward *vertical integration*
- Firms may own more assets (e.g. fleets) with lower monitoring costs
- Redesign jobs: commission/outsourcing to direct employment

More broadly,

- AI adoption can redefine firm boundaries
- It is not just for efficiency, but is a business model transformation

Takeaway

- The experiment shows that AI substitutes specific skill of a job
- AI lifts productivity of low-skilled workers *more*
- AI narrows performance gaps
- AI adoption will impact HR (hiring and training), pay, organization, and strategy.