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The Next Measurement Frontier

Making AI Count

Diane Coyle and John Lourenze Poquiz

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Economics of Transformative AI Workshop

Stanford University

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As AI becomes transformative, statistical systems should keep up

- AI has the potential to transform the economy in many ways
  - Better quality services
  - Changing nature of work
  - Time allocations
  - Among others
- This progress will be difficult to track through official statistics
- Some long-standing measurement issues aggravated by AI
- And some new ones

We discuss the challenges in measuring the transformation

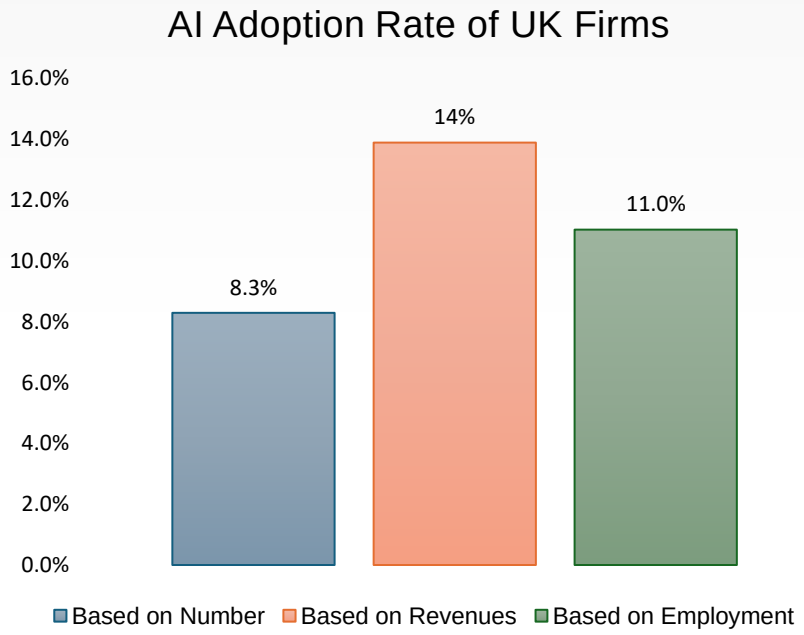
- We do not discuss the challenges in measuring AI Systems as an asset (this deserves a separate project)
- We focus on the measurement challenges arising from this transformation:
  - Service flows provided by AI
  - Inputs required by AI systems
  - Cascading impact of AI to other outputs
  - How processes are changing
  - Time

Are AI services captured in the National Accounts?

- The answer is Yes and No
- Purchased AI Services are captured through market transactions
    - But some of these services are currently zero priced at consumption
- LLM functions are embedded in other zero-priced products (e.g. Google Search)
- Can we keep up with quality changes in AI services?
- How do we determine how much value households derive from these services?

To what degree do other industries employ AI services?

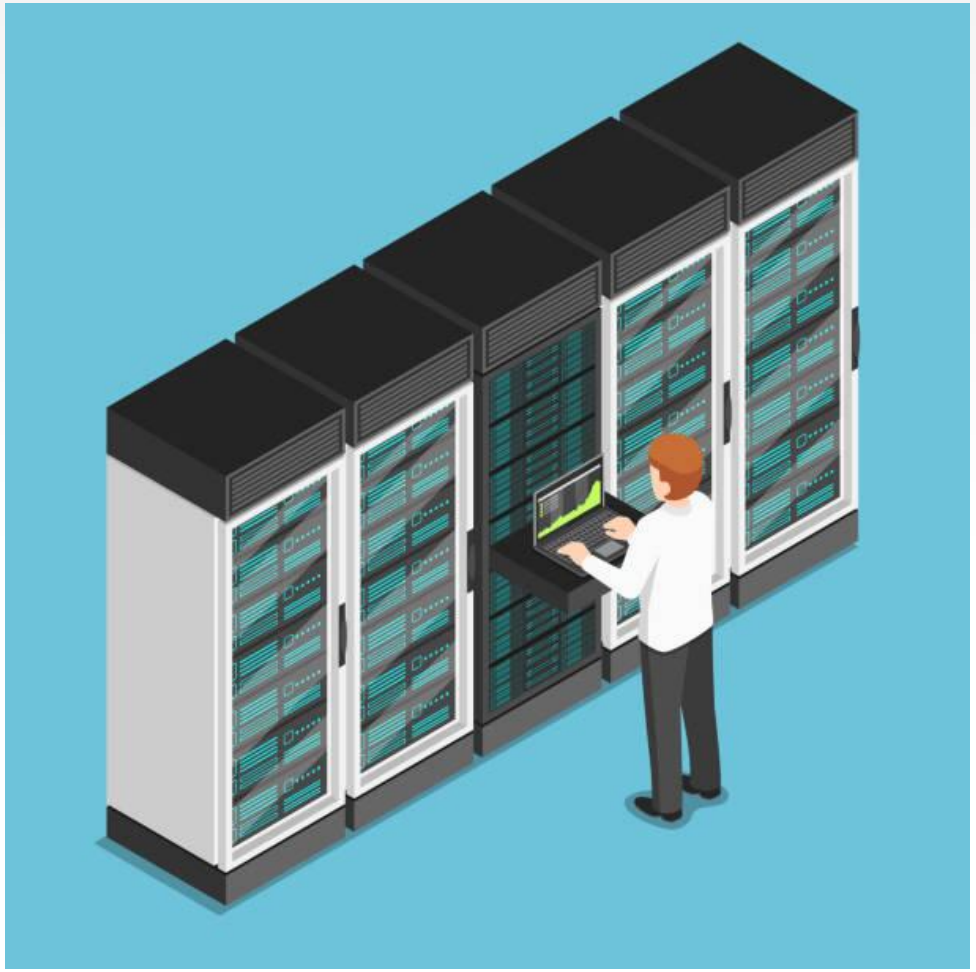
- AI adoption is low but growing
- Can we make AI usage more visible in the National Accounts?
- LLM functions are embedded in other digital products (e.g. Microsoft co-pilot, Overleaf, even email)
  - Could be addressed through quality adjustment
  - This does not address visibility question
- Capitalized creative outputs (i.e. advertising jingles generated by AI)
- Do we produce timely indicators of exposure or do we just infer from investment data?



Source: 20203 Management and Expectation Survey, Office for National Statistics, UK

Keeping track of AI inputs

- AI Systems require physical infrastructure (data centres), energy, and water
- These are spread across different locations
- Can statistics reflect the extent to which national AI systems are exposed to foreign supply chains?
- How do we account for the energy and carbon footprint of AI?
    - Capital tables
    - Multi-regional input output tables



Thinking in terms of tasks

- Existing surveys do not have the detail to reflect AI labour input (e.g. specialised engineers, data scientists)
- AI Workforce: Roles x Skills
- Improving labor force surveys to **capture tasks** and **time devoted to tasks**
- Complementary data sources:
  - Time-Use data
  - Admin data, employer surveys
  - Online platform data/private data

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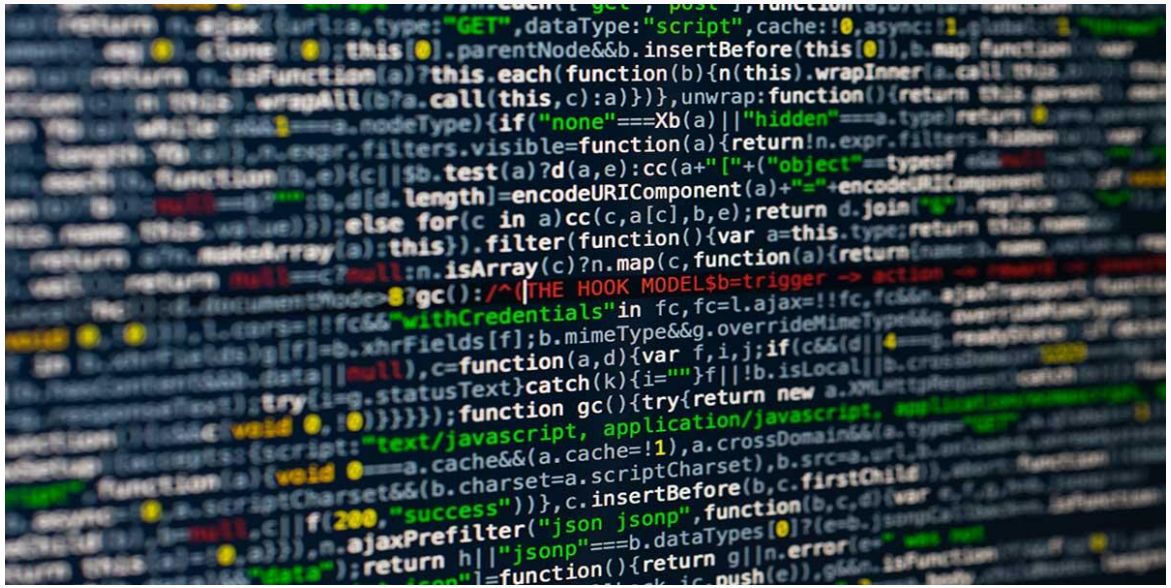
Measuring the value of training data

- SNA 2025 recommends accounting for data as an asset
- How do we properly value data when it is not sold in the market?
  - How do we account for returns to capital?
  - Does the CRS assumption hold for data? Evidence say no.
  - New LLMs are becoming more data-efficient
- The value of data is context dependent
- What is it useful to measure here?



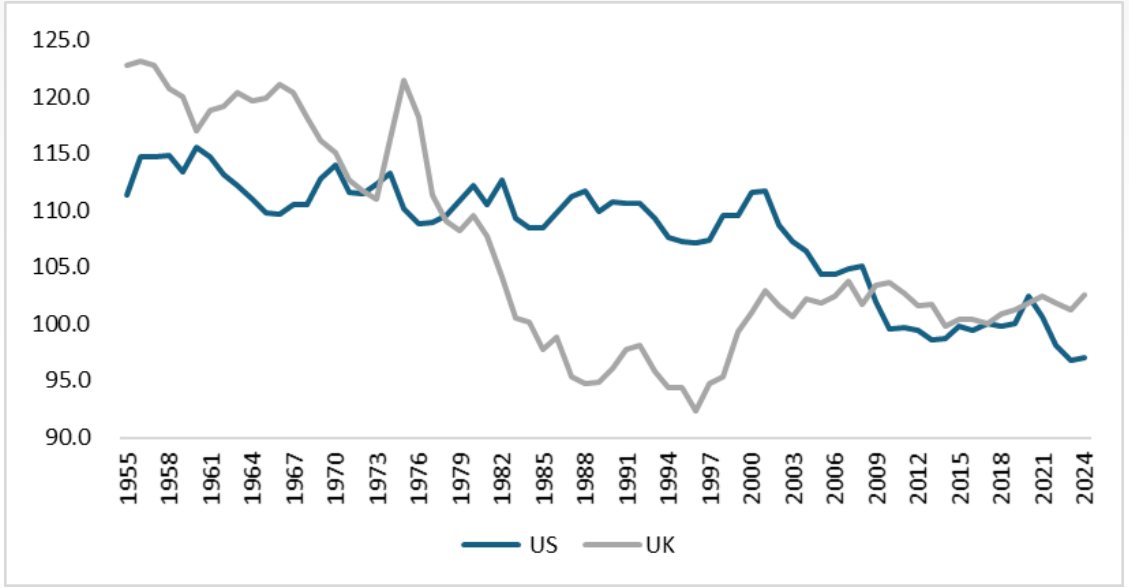
Keeping up with quality improvements

- When AI improves user experience, how do we adjust for quality?
  - AI-assisted diagnostics
  - Chatbots and virtual assistants
  - Customization
- Indicators from non-traditional sources:
  - Marketing analytics, platform usage, and consumer sentiment
- In the public sector: not just outputs but outcomes

Catching up with the changing nature of production

- Automation rapidly shifting the allocation of income from labor to capital
- In most of these cases, tasks remain the same, but they are allocated to different factor of production
  - Need to analyze task data – are new bundles of tasks being created
- But the way tasks are organized could also change
  - Improvements in time-use surveys and job task mapping

Labor share index (2019 = 100) for the US and the UK



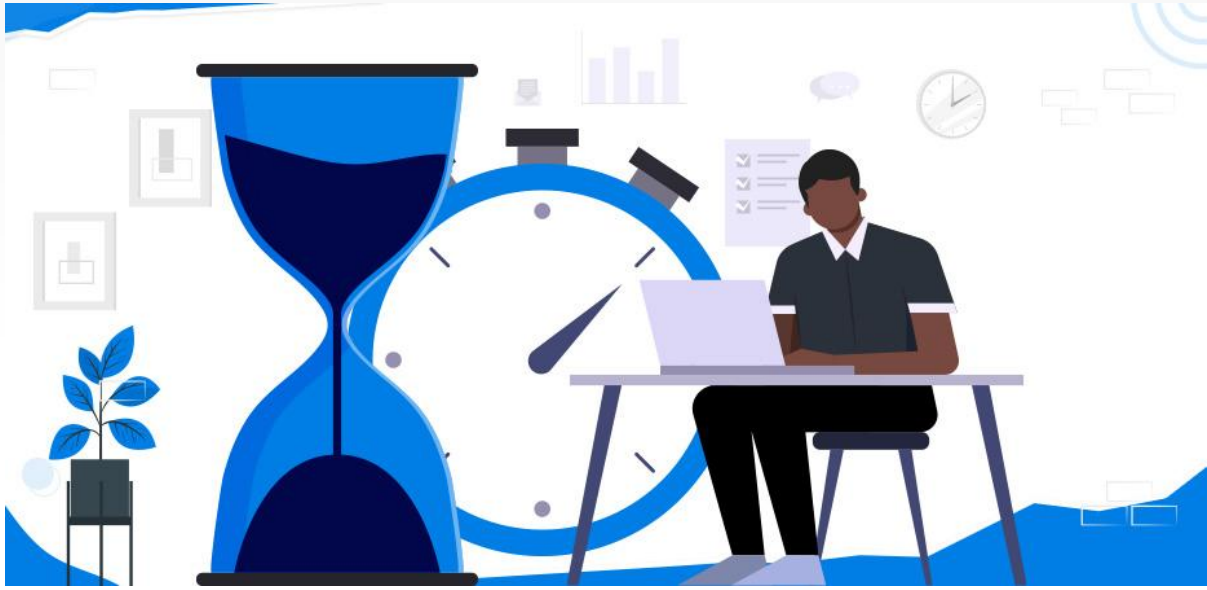
Source: Federal Reserve Bank of St Louis
Office for National Statistics, UK

Would there be a paradox of efficiency?

- AI could eliminate inefficiencies and compressing formerly labor-intensive or time-consuming processes
- Aggregate measured output may decline even as economic welfare increases.
- General equilibrium effects could ***eventually*** raise output, but the economy could experience ***short-run*** decoupling of welfare and GDP

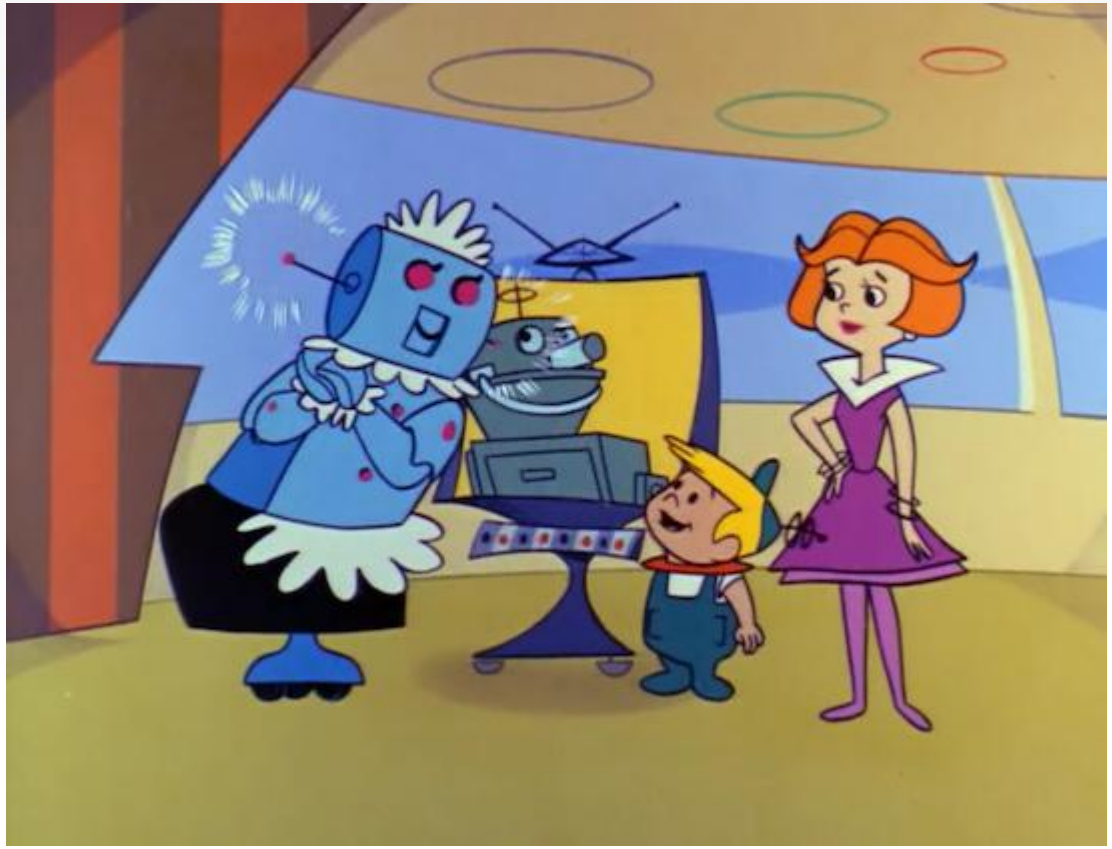
Time to rethink time at work

- AI's potential to free people from routine cognitive tasks
- This presents a challenge in capturing the shift from routine to higher-order cognitive work
- Hours worked, employment counts, may remain unchanged even as the nature of tasks evolves significantly
- What happens to wage distribution?
- New business models?



Capital-Driven Household Production

- AI is already enhancing domestic efficiency in mundane tasks
- From AI-powered vacuum cleaners to humanoid robots
- Can we measure household productivity?
- Market wages may not be sufficient for the replacement cost approach



Concluding remarks

- Recognizing AI as a separate software asset is a small step in the right direction for the SNA2025
- Existing frameworks and statistical instruments will struggle to capture AI's broader impact
  - Granular and outcome-oriented measures are needed
  - Collaboration with businesses for data – new statistical workflows and tools needed
  - International collaborations
- This is not exhaustive

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