Discussion of "*Technology and the Size and Composition of Workforce in U.S. Firms: First Evidence from the 2019 Annual Business Survey*

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Introducing the Annual Business Survey (ABS)

- First look at exciting new dataset!
- Large survey focusing on adoption and workplace impacts of many technologies
- Particularly exciting feature – can be linked to many other datasets to answer many questions

Summary of Key Patterns

- Adoption of AI and robotics is somewhat low
- These technologies appear to be labor augmenting (except for maybe robotics)
- Biggest effects on labor seem to be a redistribution towards higher skilled workers

Outline for Discussion

1. Why is adoption of Robotics/AI so low?
2. Suggestions for analysis within 2019 ABS
3. Possible uses of future waves of ABS

Findings raise a question: why is adoption of these new technologies (Robotics/AI) so low?

- Preliminary results suggest some possible explanations:
  1. Existence of big fixed costs

Large firms are far more likely to use AI and Robotics

AI				
Age/Size	0-9 Emp	10-49 Emp	50-249 Emp	250+ Emp
0-5 Years	0.04 (0.04)	0.04 (0.05)	0.06 (0.06)	0.06 (0.06)
6-10 Years	0.03 (0.03)	0.04 (0.04)	0.05 (0.06)	0.07 (0.09)
11-20 Years	0.03 (0.03)	0.04 (0.04)	0.06 (0.06)	0.10 (0.13)
21+ Years	0.02 (0.02)	0.03 (0.03)	0.04 (0.04)	0.07 (0.21)

Robotics				
Age/Size	0-9 Emp	10-49 Emp	50-249 Emp	250+ Emp
0-5 Years	0.02 (0.02)	0.03 (0.03)	0.04 (0.04)	0.06 (0.05)
6-10 Years	0.02 (0.02)	0.03 (0.03)	0.05 (0.05)	0.06 (0.08)
11-20 Years	0.01 (0.02)	0.03 (0.03)	0.05 (0.06)	0.10 (0.12)
21+ Years	0.01 (0.01)	0.03 (0.03)	0.06 (0.07)	0.13 (0.28)

Comment 1: why is adoption of these new technologies (Robotics/AI) so low?

- Preliminary results suggest some possible explanations:
  1. Existence of big fixed costs
  2. Doesn't cut costs or not profitable

Adoption of AI/Robotics seems to be transitory

AI	No Use in 2019	Testing in 2019	Use in 2019
No Use in 2018	0.97 (0.95)	0.00 (0.01)	0.03 (0.04)
Testing in 2018	0.78 (0.73)	0.09 (0.10)	0.13 (0.17)
Use in 2018	0.82 (0.78)	0.02 (0.04)	0.15 (0.19)

Robotics	No Use in 2019	Testing in 2019	Use in 2019
No Use in 2018	0.98 (0.95)	0 (0)	0.02 (0.04)
Testing in 2018	0.64 (0.57)	0.11 (0.14)	0.25 (0.29)
Use in 2018	0.46 (0.33)	0.02 (0.01)	0.53 (0.66)

*Employment-weighted in parentheses

- Validating adoption against firm-level outcomes seems like a very valuable next step

Findings raise a question: why is adoption of these new technologies (Robotics/AI) so low?

- Preliminary results suggest some possible explanations:
  1. Existence of big fixed costs
  2. Doesn't cut costs or not profitable
  3. Technology isn't good enough yet

AI technology still developing

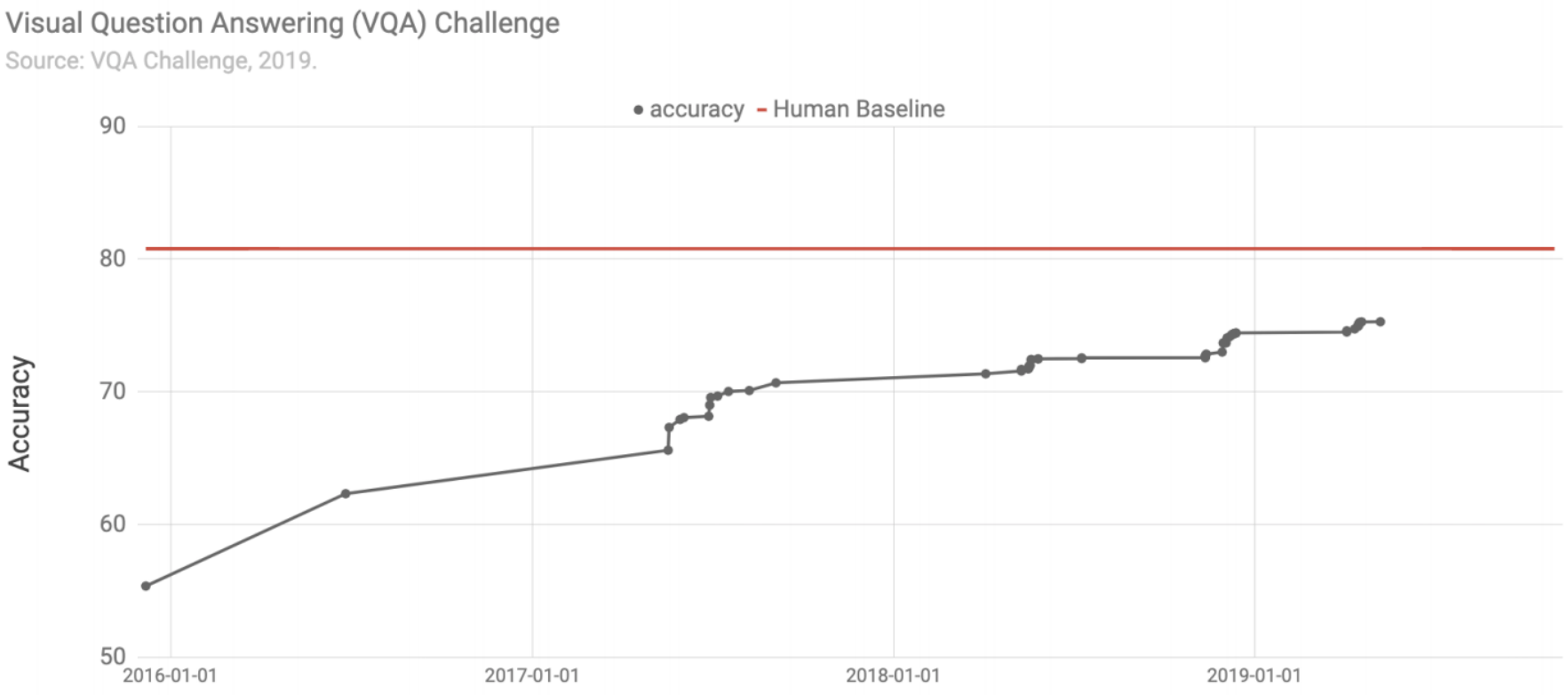

Fig. 3.6.
Note: Human performance is measured by having humans answer questions for images and evaluating their answers using the same metrics as we use to evaluate machines that answer the same questions. Inter-human disagreement, paraphrased answers, spelling errors, etc, contribute to human performance being (quite a bit lower) than 100%.

Source: AI Index 2019 Report

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  1. Does the price of labor affect firms willingness to adopt technology?
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  2. Is there regional clustering in adoption? Do you learn from neighbors? (Griliches 1957)

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  2. Is there regional clustering in adoption? Do you learn from neighbors? (Griliches 1957)
  3. Current focus on internal processes – does it affect quality/variety of goods produced?

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- Probe firm size results – will these new technologies have effects on competition by entrenching large/old firms?
- Explore persistence of adoption of technologies with extended panel
- Validation of employment effects using ASM/QCEW data
- As AI gets better, do we begin to see explosive adoption? Will the labor-market impacts change?

Conclusion

- Exciting new data on technology adoption and effects on employment
- Validation of reported results seems like very important next step
- Many potential directions for future research