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## Comment Rebecca Henderson

“Artificial Intelligence and the Modern Productivity Paradox” is a fabulous chapter. It is beautifully written, extremely interesting, and goes right to the heart of a centrally important question, namely, what effects will AI have on economic growth? The authors make two central claims. The first is that AI

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is a general purpose technology, or GPT, and as such is likely to have a dramatic impact on productivity and economic growth. The second is that the reason we do not yet see it in the productivity statistics is because—like all GPTs—this is a technology that will take time to diffuse across the economy.

More specifically, the authors argue that AI will take time to diffuse because its adoption will require mastering “adjustment costs, organizational changes, and new skills.” They suggest that just as we did not see IT in the productivity statistics until firms had made the organizational changes and hired the human capital necessary to master it, so the adoption of AI will require not only the diffusion of the technology itself but also the development of the organizational and human assets that will be required to exploit its full potential.

This is a fascinating idea. One of the reasons I like the chapter so much is that takes seriously an idea that economists long resisted—namely, that things as nebulous as “culture” and “organizational capabilities” might be (a) very important, (b) expensive, and (c) hard to change. Twenty-five years ago, when I submitted a paper to the *RAND Journal of Economics* that suggested that incumbents were fundamentally disadvantaged compared to entrants because they were constrained by old ways of acting and perceiving, I got a letter from the editor that began “Dear Rebecca, you have written a paper suggesting that the moon is made of green cheese, and that economists have too little considered the motions of cheesy planetoids”

I like to think that few editors would respond that way today. Thanks to a wave of new work in organizational economics and the pioneering empirical research of scholars like Nick Bloom, John van Reenen, Raffaella Sadun, and the authors themselves, we now have good reason to believe that managerial processes and organizational structures have very real effects on performance and that they take a significant time to change. One of the most exciting things about this chapter is that it takes these ideas sufficiently seriously to suggest that the current slowdown in productivity is largely a function of organizational inertia—that a central macroeconomic outcome is a function of a phenomenon that thirty years ago was barely on the radar.

That’s exciting. Is it true? And if it is, what are its implications?

My guess is that the deployment of AI will indeed be gated by the need to change organizational structures and processes. But I think that the authors may be underestimating the implications of this dynamic in important ways.

Take the case of accounting. A few months ago, I happened to meet the chief strategy officer for one of the world’s largest accounting firms. He told me that his firm is the largest hirer of college graduates in the world—which may or may not be true, but which he certainly believed—and that his firm was planning to reduce the number of college graduates they hire by 75 percent over the next four to five years—largely because it is increasingly clear that AI is going to be able to take over much of the auditing work currently performed by humans. This shift will certainly be mediated by

every accounting firm's ability to integrate AI into their procedures and to persuade their customers that it is worth paying for—examples of exactly the kinds of barriers that this chapter suggests are so important—but in principle it should dramatically increase the productivity of accounting services, exactly the effects that Erik and his coauthors are hoping for.

But I am worried about all the college graduates the accounting firms are not going to hire. More broadly, as AI begins to diffuse across the economy it seems likely that a lot of people will get pushed into new positions and a lot of people will be laid off. And just as changing organizational processes takes time, so it's going to take time to remake the social context in ways that will make it possible to handle these dislocations. Without these kinds of investments—one can imagine they might be in education, in relocation assistance, and the like—there is a real risk of a public backlash against AI that could dramatically reduce its diffusion rate.

For example, the authors are excited about the benefits that the widespread diffusion of autonomous vehicles are likely to bring. Productivity seems likely to skyrocket, while with luck tens of thousands of people will no longer perish in car crashes every year. But “driving” is one of the largest occupations there is. What will happen when millions of people begin to be laid off? I'm with the authors in believing that the diffusion of AI could be an enormous source of innovation and growth. But I can see challenges in the transition at the societal level, as well as at the organizational level. And there will also be challenges if too large a share of the economic gains from the initial deployment of the technology goes to the owners of capital rather than to the rest of society.

Which is to say that I am a little more pessimistic than Erik and his coauthors as to the speed at which AI will diffuse—and this is even before I start talking about the issues that Scott, Iain, and I touch on in our own chapter, namely, that we are likely to have significant underinvestment in AI relative to the social option, coupled with a fair amount of dissipative racing.