

# The Pandemic, Automation, and Artificial Intelligence

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Executive Briefing: AI and Machine Learning  
Global Interdependence Center  
Philadelphia, PA (virtual)

October 6, 2020

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Good afternoon and welcome! I'm thrilled to be with you today, even if we are meeting — fittingly for the topic of today's webinar — in a rather “artificial” format. We are all hoping that the next time we gather together, it will actually be in person.

Now, we may be meeting in unusual circumstances today, but some things never change. One of those is my standard Fed disclaimer: The views I express today are my own and do not necessarily reflect those of anyone else on the Federal Open Market Committee or in the Federal Reserve System.

We're gathered here for what I'm certain will be a fascinating discussion on artificial intelligence — and specifically, the effect that COVID-19 has had on the field.

### **COVID-19 and the Economy**

But I think there is an unwritten rule somewhere that every time a Fed president addresses an audience, he or she also must also give an outlook on where the economy is headed. It's one of the hazards of the job, I suppose.

So, I'll begin with that, offering a quick look at where the economy has been, where it is now, and where it might be headed. And after that, I'll share a few considerations on automation and AI.

It's no secret that the economy has been profoundly affected by the same scourge that has kept us physically apart today: COVID-19. So, let's begin with where we are with COVID-19, given that the virus itself, more than anything else, is determining the trajectory of the economy.

As you well know, still less than a year after COVID-19 first emerged, the virus has infected more than 30 million people around the world and killed more than 1 million.

Our own country has been particularly hard hit. Because of the United States' inability to control the virus, we've experienced approximately 21 percent of the world's deaths, despite housing only about 4 percent of the world's population. Infection rates have come down from the highs we saw in the spring and summer, but the virus is still circulating widely in large swaths of the country. And in recent days, we've even seen alarming spikes in other areas, like New York City, that we had hoped had permanently suppressed their infection rates.

And even within this disproportionately hard-hit country, certain communities have suffered more than others. Racial minorities, particularly Black Americans and Hispanics, have been sickened from the coronavirus at a far higher rate than other groups. They have also died at a higher rate. And in the ensuing economic contraction, they have lost their jobs at a higher rate.

A virus as contagious, deadly, and frankly as mysterious as COVID-19 was bound to have a significant economic impact. Even before state and local governments took action this spring, many Americans had stopped dining out, getting on airplanes, and checking in to hotels. State and local governments then compounded the economic misery when — and I want to stress that they did so in a responsible attempt to protect public health — they shuttered many businesses deemed nonessential.

The upshot? In the second quarter of this year, the U.S. experienced its worst quarterly GDP drop in recorded history when the economy contracted at an annualized rate of nearly 33 percent. Twenty-two million jobs evaporated. Those with low-wage jobs, particularly racial and ethnic minorities, were hardest hit.

The good news is, following that contraction, the economy has rebounded faster than many of us had projected. Stay-at-home orders have been lifted, and though large segments of the economy remain depressed, millions of Americans have returned to their jobs. Indeed, about half of those 22 million residents who were suddenly out of work earlier this year are now back, enough to nudge the unemployment rate down from 10.2 percent to 7.9 percent, which is still disastrously high.

For now, I expect this recovery to continue, though not fast enough that, by the end of this year, GDP will have returned to where it was before the pandemic struck. In fact, there have been a few recent signs of plateauing, suggesting that a return to the baseline will take quite some time. Segments like tourism and hospitality will remain subdued for a long time to come, presenting an overall drag on GDP

and employment growth. Employment, unfortunately, probably won't be back to pre-pandemic levels until 2023. Last week's disappointing jobs report underscored how far we have to go.

I want to caution that this forecast is freighted with uncertainty because, once again, of COVID-19. The scenario of continued growth that I have presented depends on a sustained decline in the rate of new infections — probably a result of nearly universal mask wearing, especially indoors — that ensures only sporadic new outbreaks. We're also assuming that a vaccine becomes widely available sometime mid to late next year. But COVID-19, as the world has learned all too painfully, is difficult to control. And so, the path of the economy largely depends on the path of the virus.

It depends in no small part, too, on the path that the federal government chooses to take. My forecasts are assuming an additional \$1 trillion of fiscal support, which has yet to materialize.

### **COVID-19 and Automation**

Fundamentally, this pandemic has had the effect of accelerating trends that were already present in our society. Categories like department stores were *already* struggling — and COVID-19 only served to expedite their obsolescence. Racial minorities like Black Americans were *already* more likely to be unemployed than other groups — and COVID-19 heightened this yawning disparity.

Similarly, trends in labor markets like the increased use of automation are not new. They are simply happening at a more rapid clip since the onset of the pandemic.

For decades, the U.S. economy has seen increasing automation in industries spanning manufacturing to food service to office work. But the COVID-19 pandemic has ensured that those transitions are now occurring at lightning speed.

Researchers here at the Philadelphia Fed have been closely studying the effect of the pandemic on labor markets and automation and have made several key — if still rather preliminary — findings. I would like to share some with you.

Some of their findings have been predictable: It turns out that the most automatable jobs are those that do not permit remote work and those that carry a high risk of COVID-19 transmission. Obviously, machinery and software are not susceptible to the virus so have often become more attractive options than human workers during the pandemic. Think of meat-packing and slaughterhouse jobs, for example, which are increasingly automated. Or, closer to home, think of the Pennsylvania Turnpike laying off more than 500 workers this spring as it switched to automatic tolling.

Other findings are more surprising and deeply alarming. You might expect that a lot of the jobs that were eliminated because of COVID-19 might come roaring back after the virus passes, for example. But this might not be the case.

Fed researchers have found, based on precedent dating to prior recessions, that, in fact, many of the jobs that the pandemic eliminated may never return — even after the virus has passed. They will instead be automated. Those Pennsylvania Turnpike workers were permanently laid off, for instance.

Our researchers have also found that minority workers are more likely than other groups to hold jobs that could be lost, permanently, to automation. And that leads to the alarming conclusion that pandemic-induced automation will, as we have in fact seen, only serve to accentuate preexisting disparities in our society.

We can't stop technological progress, of course. But this wave of automation will require each of us to think hard about how we can transition affected workers into new, stable careers filled with opportunity.

### **COVID-19 and Algorithms**

The pandemic likewise has had a profound effect on the algorithmic artificial intelligence that is increasingly used to power large segments of our economy. Algorithms are built on precedent, and so it's little surprise that as COVID-19 caught governments unawares, it also significantly affected their ability to process what was happening. The algorithms — like all of us — had simply never experienced the set of circumstances that COVID-19 presented. And so many algorithms have seen a deterioration in their performance during this period.

Take credit scores. One would assume that in a time when 22 million Americans had lost their jobs and millions more Americans had their hours cut that credit scores would have declined. But in fact, the opposite happened: Credit scores have, in the aggregate, risen during this period.

One reason for this is that, even in this economic downturn, delinquencies are actually down because the aforementioned CARES Act mandated loan forbearance. That was absolutely the right thing to do but led the currently used algorithms to the counterintuitive conclusion that default probabilities have in fact decreased.

Another consideration going forward will be to ensure that algorithms do not serve to perpetuate the kinds of discrimination that we have seen historically in our financial sector. Will machine learning

perpetuate long-standing inequities in, for instance, the rate at which certain racial groups are turned down for loans?

This issue will require a conversation spanning academic fields — computer science, law, economics, and others.

And it will also require action from not just regulators but probably lawmakers, too, given that many of the laws governing discrimination date back to 1961, when computers couldn't even fit inside a single room. Conversations like the one we are hosting today hold important implications for the future of our economy — and making sure that we are building an equitable future for all of us.

And in the meantime, we can rest assured the development of artificial intelligence and machine learning will continue — though I hope it stops before they figure out a way to replace Fed presidents with robots.

Thank you very much.