**Richmond Fed**

# The Evolution of Technological Disruption

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**Highlights:**

- The economy has seen a number of disinflationary innovations in recent years. These innovations put "the wind at our back" when it came to containing inflation.
- But we've been through quite a storm over the last two years, and it is appropriate to ask whether anything has changed and if the wind has shifted in a more inflationary direction.
- We've seen vulnerabilities associated with a globally complex supply chain, investments in renewable energy, and changing demographics that may shift labor from being abundant to being scarce, all of which could result in rising cost pressures.
- It's possible that we could return to pre-pandemic wind conditions, but what if we are in a new era – one in which we face inflationary headwinds?
- Our goal, 2 percent target inflation, wouldn't change, nor would our longer-run ability to meet that goal, but the appropriate path to achieve it could.

Thanks to all of you for joining us in Atlanta today. We started this conference four years ago, the year I joined the Fed after a 30-year business career. It's hard to remember today, but a core topic for the Fed back then was why inflation had remained below our 2 percent target for so long. Along with Rob Kaplan and others, I thought real economic innovations were playing an important role, which you could particularly see in over 20 years of goods disinflation. Today, as we are emerging from the pandemic with broad-based and high inflation, I want to talk a bit about how I am updating my thinking on the relationship between technological innovation, the economy and monetary policy moving forward. As always, the views here are my own and not those of my colleagues in the Federal Reserve System or on the Federal Open Market Committee (FOMC).

The economy has seen a number of disinflationary innovations in recent years. E-commerce grew significantly over the last decade, lowering barriers to price comparisons and cutting costs for retailers. Fracking provided greater access to natural gas and oil, reducing energy prices. The procurement discipline became professionalized and pressured suppliers to offer ever-lower prices to firms, thereby reducing costs to consumers. Employers gained market power and used that to limit wage growth, as studied in the manufacturing sector by Richmond Fed economists.[1] Automation reduced labor cost pressures by increasing workforce productivity. And the rise of global supply chains enabled firms to offshore materials and services, lowering the cost of both products and labor.

Whether you loved these developments or hated them, these innovations – for any given policy stance – put "the wind at our back" when it came to containing inflation. But we've been through quite a storm

over the last two years, and it is appropriate to ask whether anything has changed. Have the winds shifted in a more inflationary direction, and if so, what are the implications?

Much has changed. Tariffs, the pandemic and Russia's invasion of Ukraine exposed the vulnerabilities of globally complex supply chains. If countries and companies rethink their trading relationships, we are likely to see higher costs and eventually higher prices. Similarly, we may well see firms reorient their procurement strategies to prioritize resiliency, not just efficiency, resulting in higher ongoing cost pressures as well.

Investments in renewable energy and energy security could elevate costs too – at least during the transition.

And changing demographics, including lower birth rates, an aging population and decreased immigration, may shift labor from being abundant to being scarce. While not technological in nature, these changes could give more power to workers to command higher wages. We are also seeing labor productivity challenges as firms struggle to fill open jobs and find their new hires require more training and support.

All that said, I don't want to declare a long-term shift in the prevailing winds when we still don't know exactly how the pandemic era will play out. Some changes may reverse in time — countries and companies notoriously have short memories. And never count disinflationary forces out. The pandemic accelerated e-commerce, so maybe its enablement of price shopping will spread even faster. New technologies can always come along in the way that fracking did. Pressure on labor could accelerate investments in productivity, furthering technologies such as artificial intelligence and robotics. Remote work — one of the themes of this conference — could increase the potential supply of labor for certain jobs and thereby reduce wages. And as businesses configure to enable more remote work, they might actually increase their openness to more offshoring. Or perhaps government policies will deliver increased labor participation, as Japan has done to increase the participation rates of older workers.

So, it is of course possible that we could return to pre-pandemic wind conditions. But what if we are in a new era — one in which we face inflationary headwinds? What would that disruption mean for our ability to meet our inflation mandate? Our goal, 2 percent target inflation, wouldn't change, nor would our longer-run ability to meet that goal, but the appropriate path to achieve it could.

We would be more likely to face periods with real forces imparting near-term inflationary pressures. Consequently, history may be less of a precedent for appropriate policy. These pressures could make "looking through" short-term shocks more difficult. They could make gradual rate increase paths less effective. They could make market functioning interventions somewhat trickier. As a result, our efforts to stabilize inflation expectations could require periods where we tighten monetary policy more than has been our recent pattern. You might think of this as leaning against the wind. Doing so would be consistent with our flexible average inflation targeting framework.

Communicating effectively could also prove more challenging. Over the last 10 years, our inflation and employment goals have not been in conflict while making policy. As such, the Fed's decisions have been relatively easy to explain. But inflationary pressure could revive the traditional Phillips curve trade-off between employment and inflation. We will need to be crystal clear that a growing economy and maximum employment require stable prices and that we will remain committed to addressing inflationary gusts.

We don't need to make any of these judgments now. It is notoriously difficult to pinpoint shifts in the weather, and the old joke is that economic forecasting was invented to make weather forecasters look good. The same could likely be said about predicting the next big thing in technology.

Technological innovations pop up every day and, in time, may well impact us in ways we haven't yet anticipated. That's why the Richmond Fed continues to sponsor this conference and to dig into the impacts of technology-enabled disruption on the broader economy. To borrow from the conference theme, today is a great opportunity to learn from the pandemic and evaluate the path ahead. Thanks for having me and enjoy the conference.

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*Chen Yeh, Claudia Macaluso, and Brad Hershbein, "Monopsony in the US Labor Market," July 2022.*