



The Impact of COVID on U.S. Productivity and Potential Output

John Fernald (INSEAD/FRBSF)

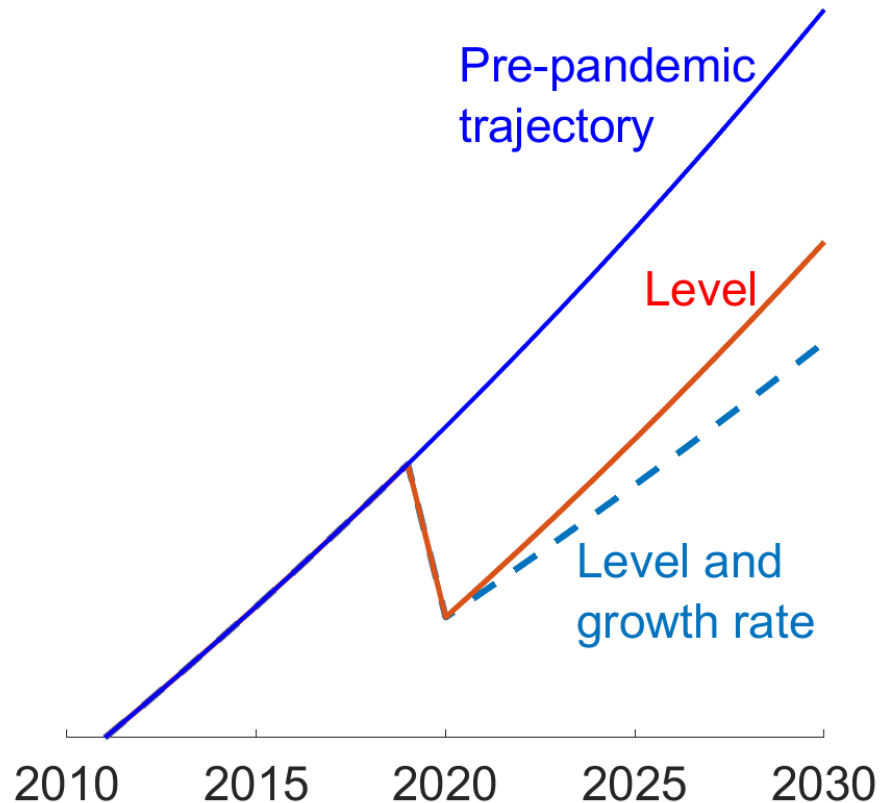
Huiyu Li (FRBSF)

January 7, 2023

The views expressed here are our own and do not necessarily reflect the views of the Federal Reserve Bank of San Francisco or the Federal Reserve System

How has the pandemic affected the level and growth rate of U.S. potential output?

Possible pandemic effects on potential output



- We came into pandemic on a slow-growth path. We look likely to leave on a similar path
- Despite the massive dislocations of the pandemic, productivity has looked surprisingly “normal”
 - Productivity growth followed Great Recession cyclical path (boom then bust)
 - Little evidence of sizeable level effect on productivity
- Industry productivity data suggest winners and losers related to teleworkability
- Near-term level effect from reduced labor supply

Accounting for potential output

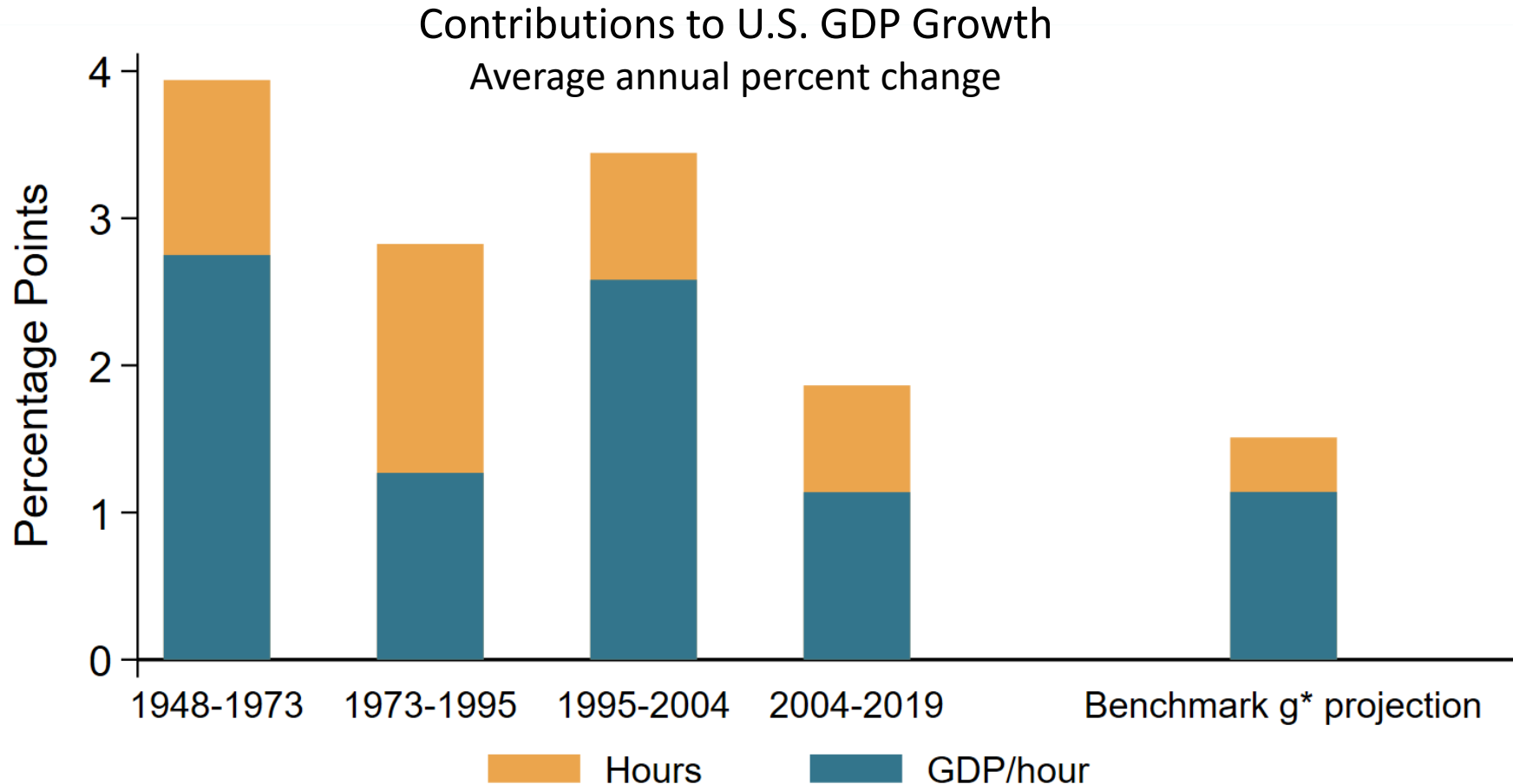
- Potential output: What output would be at “full employment”
 - Depends on full-employment labor as well as potential labor productivity (output per hour)
 - Labor supply is well short of pre-pandemic projections, harming potential output
- Rest of this talk: Understanding the labor productivity side
 - In the short run, a particular challenge is that productivity is affected by the business cycle

$$\Delta \ln Y - \Delta \ln h = \alpha(\Delta \ln k - \Delta \ln h - \Delta \ln lc) + \Delta \ln lc + \Delta \ln tfp$$

- In the longer run, labor productivity driven mainly by innovation as well as the education/experience of workers

Longer-run growth of GDP: A pre-pandemic perspective

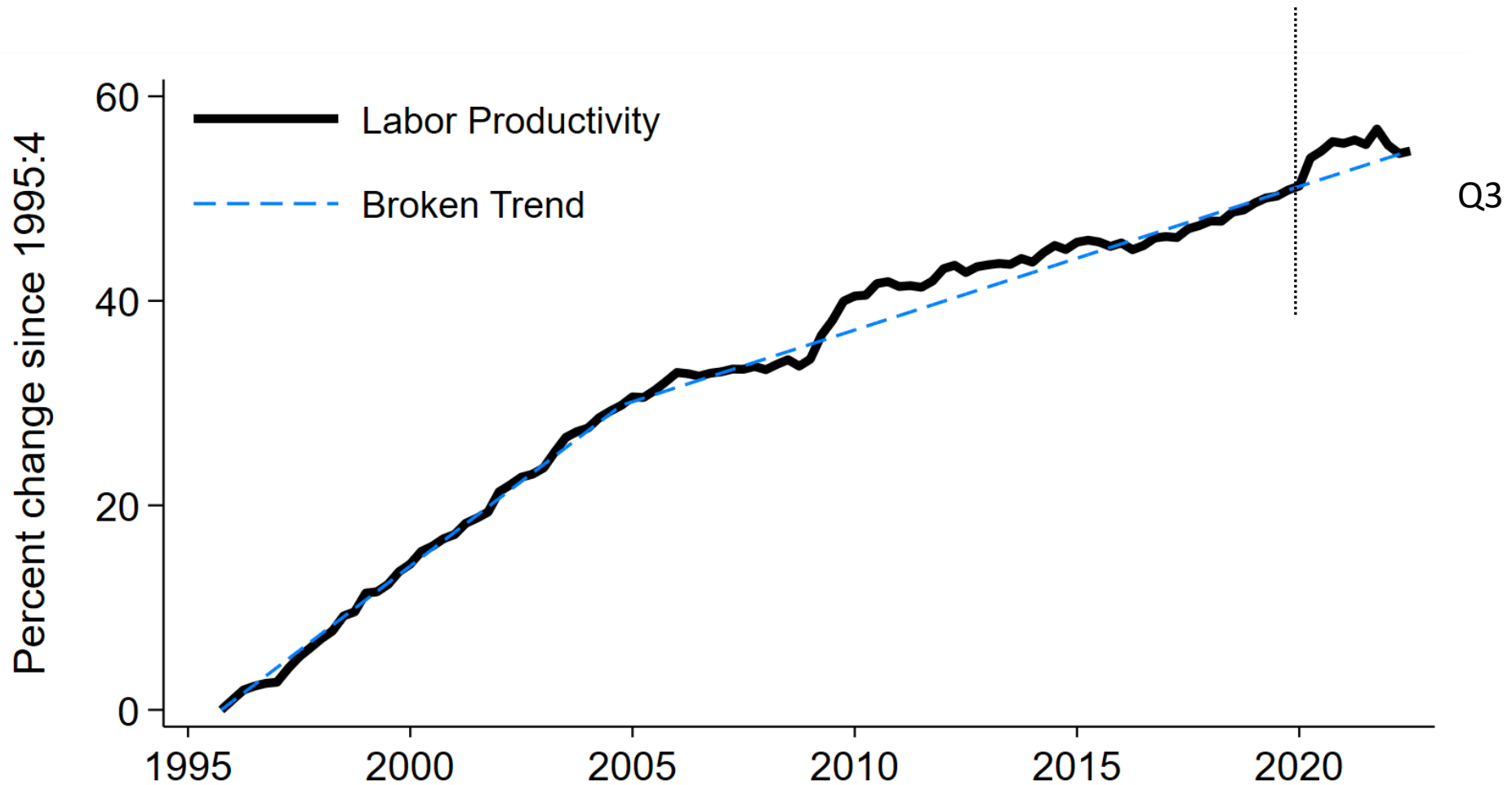
Pre-pandemic future of growth: Slow productivity regime, weak demographics



Notes: “GDP” is geometric average of real GDP and real gross domestic income. g^* projection assumes GDP per hour grows at 2004-19 pace, and hours grow at CBO (2022) projected 2027-32 labor-force growth.

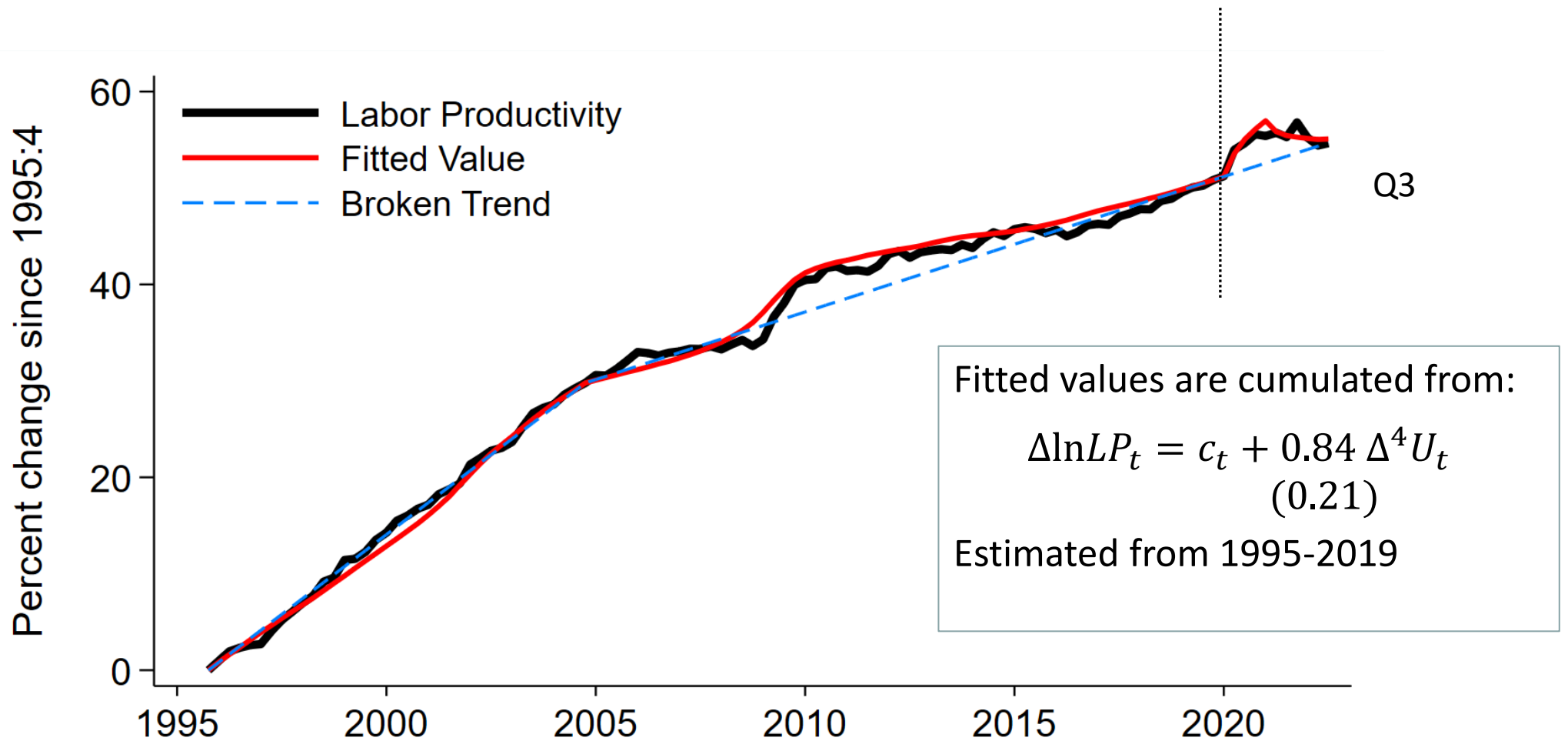
Pandemic productivity growth
consistent with slow trend and small net level effect

U.S. labor productivity: Accelerated Great Recession cyclical dynamics, little obvious level effect



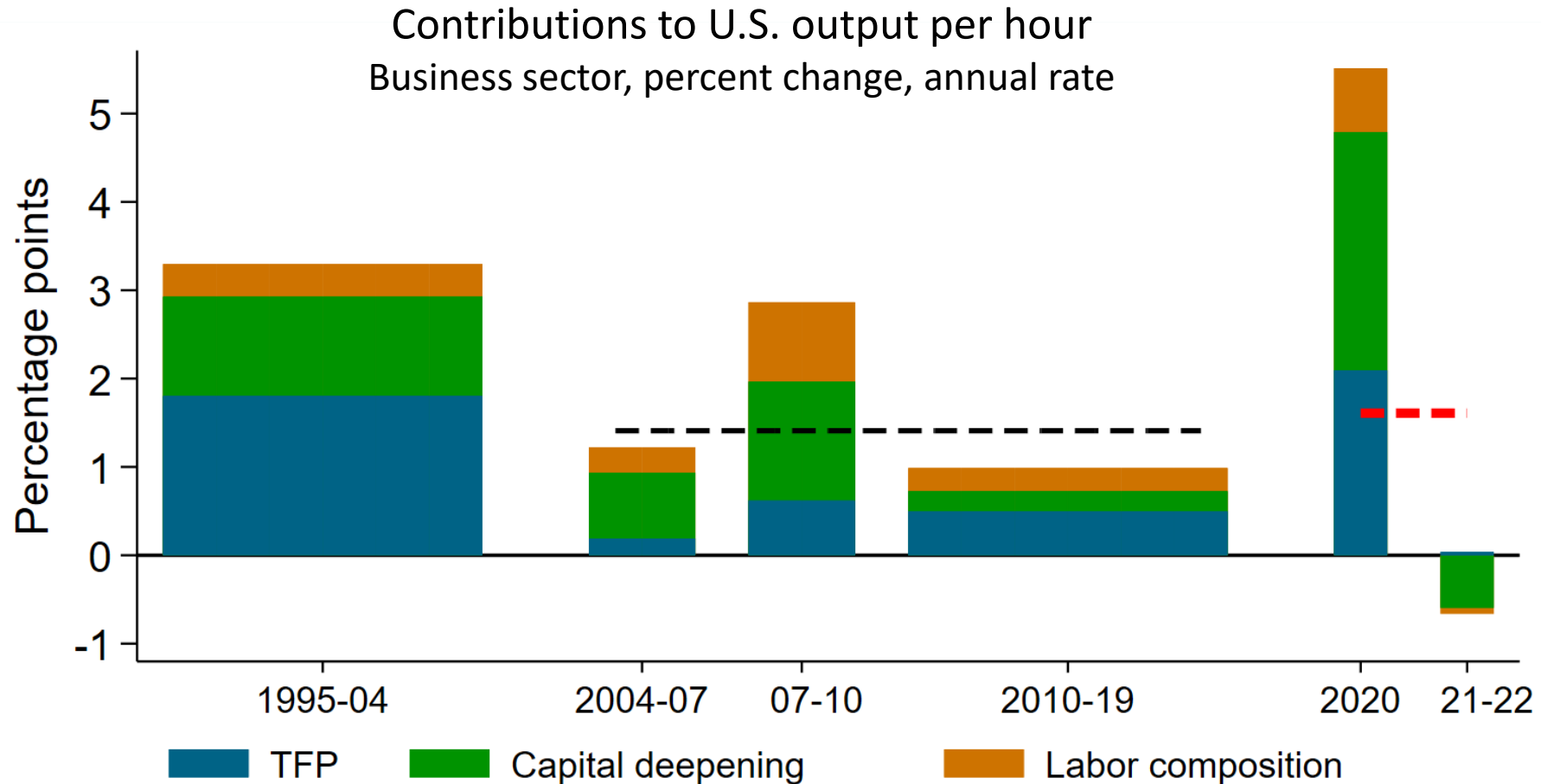
Notes: Business sector. Output is geometric average of income and expenditure measures. Regression shown relates labor productivity growth ($\Delta \ln LP_t$) to the four-quarter change in the unemployment rate ($\Delta^4 U_t$) for the pre-pandemic period. Constant term (not shown) changes after 2004:4. 2020:1—22:3 fitted values condition on actual unemployment path.

U.S. labor productivity: Accelerated Great Recession cyclical dynamics, little obvious level effect



Notes: Business sector. Output is geometric average of income and expenditure measures. Regression shown relates labor productivity growth ($\Delta \ln LP_t$) to the four-quarter change in the unemployment rate ($\Delta^4 U_t$) for the pre-pandemic period. Constant term (not shown) changes after 2004:4. 2020:1—22:3 fitted values condition on actual unemployment path.

Initial pandemic productivity boom from capital deepening and labor composition, which then reverse

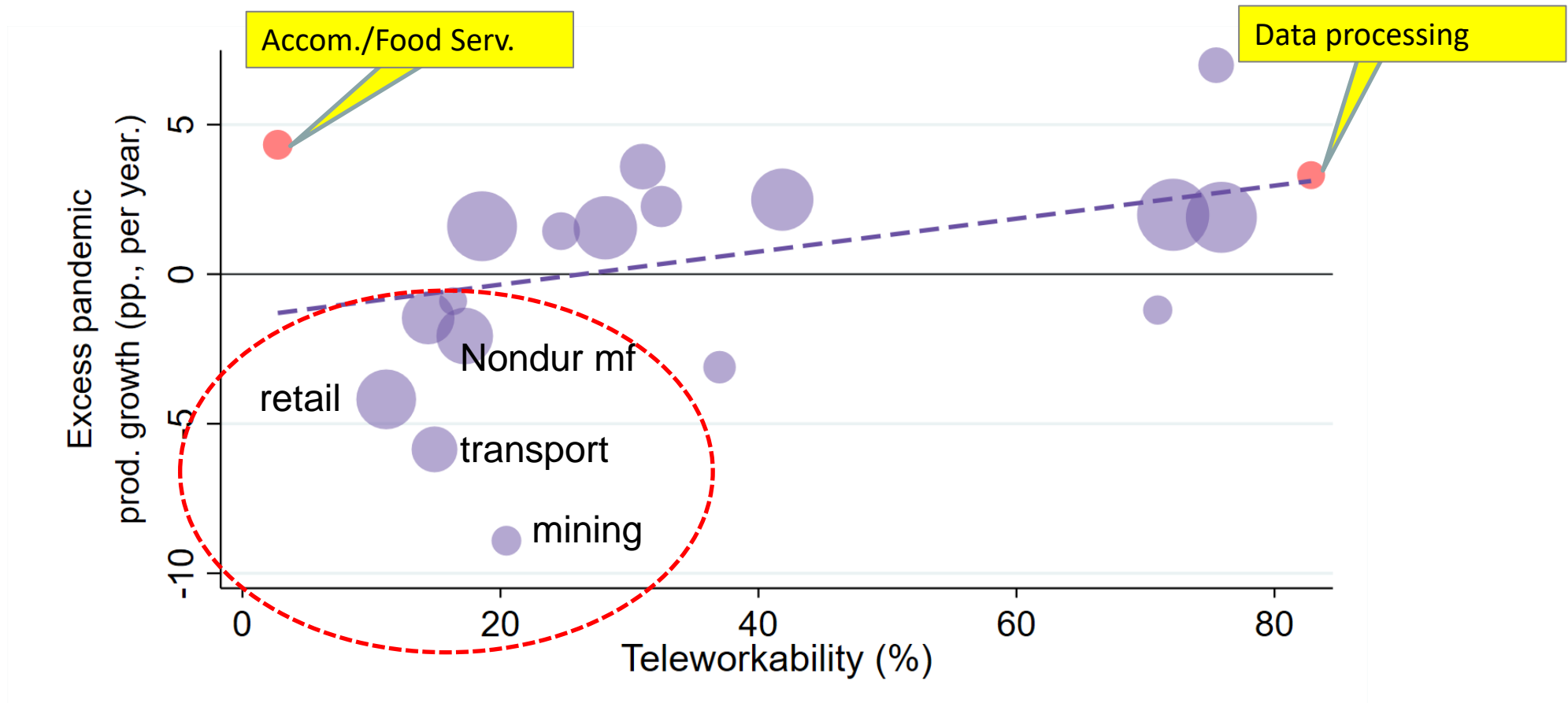


Notes: Source is Fernald (2014). Quarterly data. Output is geometric average of income and expenditure measures. Black dashed line is average labor productivity growth from 2004-19. Red dashed line is average since the end of 2019. 2020 is Q4/Q4. 21-22 is the seven quarters ending 2022:3. Capital deepening is contribution of capital relative to composition-adjusted hours.

“Teleworkable” industries did somewhat better

Low teleworkability industries typically performed poorly

Industry pandemic productivity growth (relative to pre-pandemic trend) versus teleworkability



Fernald and Li (2022). Bubble size represents industry share of GDP in 2019Q4. Fitted line weighs industries by GDP share. Vertical axis is average growth of industry output per hour from 2019Q4-2022Q2 relative to 2006-2019 average.

Takeaways: Productivity behaved in surprisingly normal ways during the pandemic

- Roller coaster ride up and down
- Productivity growth followed exaggerated/accelerated Great Recession cyclical path of boom and bust
 - Data broadly consistent with pre-pandemic slow underlying trend
 - Industry winners and losers loosely linked to teleworkability, though interpretation remains unclear