

Productivity in a Time of Change: An Optimistic Case

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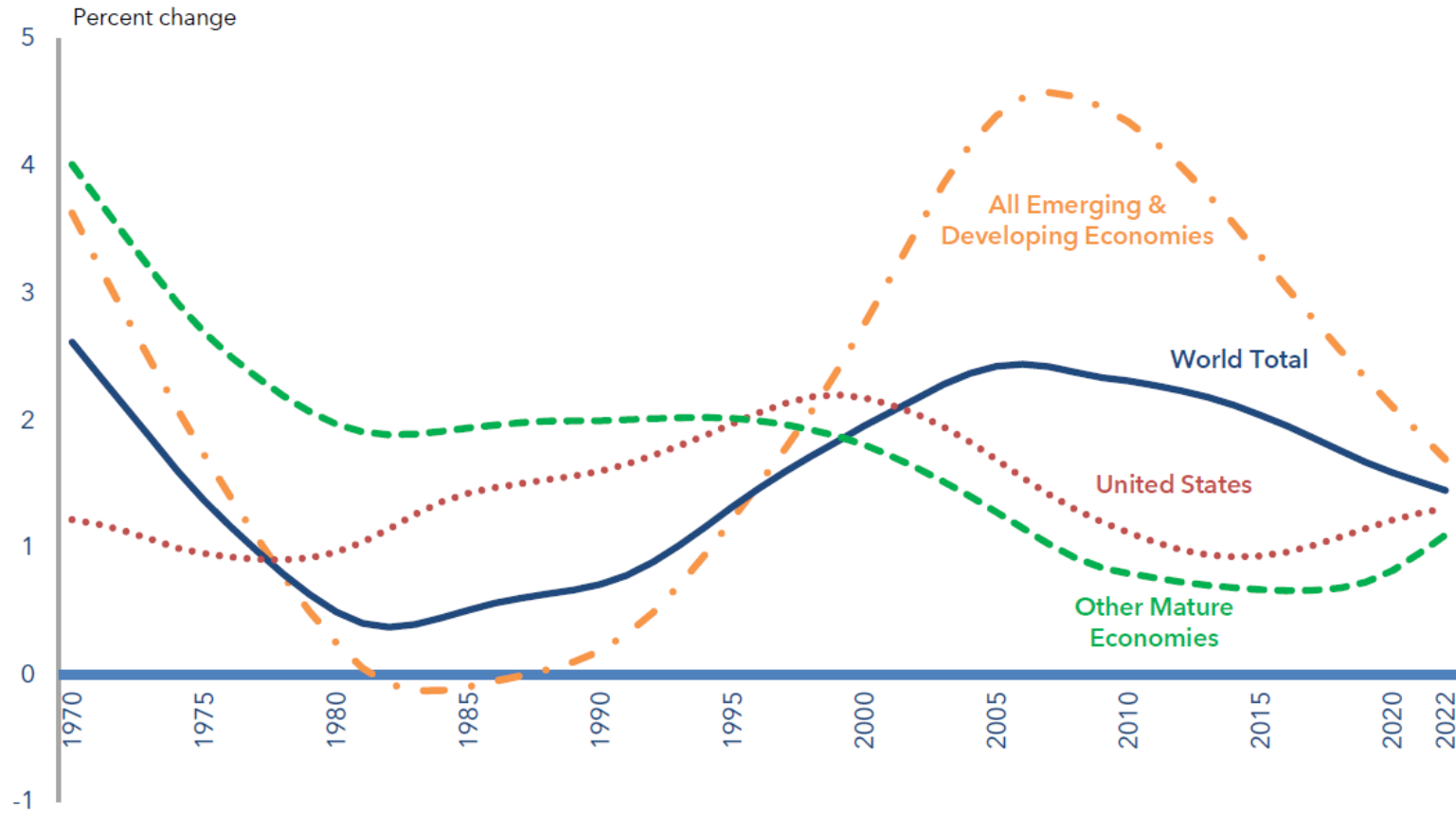
University of Chicago Booth School of Business

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Productivity Slowdown Is the Economic Problem of Our Time

CHART 1: Trend growth of GDP per Person Employed using HP filter, Major Regions, 1970-2022



Source: *The Conference Board Total Economy Database™ April 2022.*

Notes: Trend growth rates are obtained using HP filter, assuming $\lambda=100$; Regional productivity growth rates are derived as the difference between nominal GDP weighted GDP growth and hours worked weighted hours worked growth.

Productivity Slowdown Is the Economic Problem of Our Time

- Productivity growth is the speed limit on the growth of material well being
 - Raising labor productivity growth by 1% for a generation makes incomes one-third higher than they would have been otherwise
 - An extra 1% right now is about \$1 trillion (\$120 per capita)
- Productivity growth makes *everything* easier
 - Better to loosen a constraint than try to do better within a constraint

Korea Has Been a Productivity Outperformer (But Is Slowing)

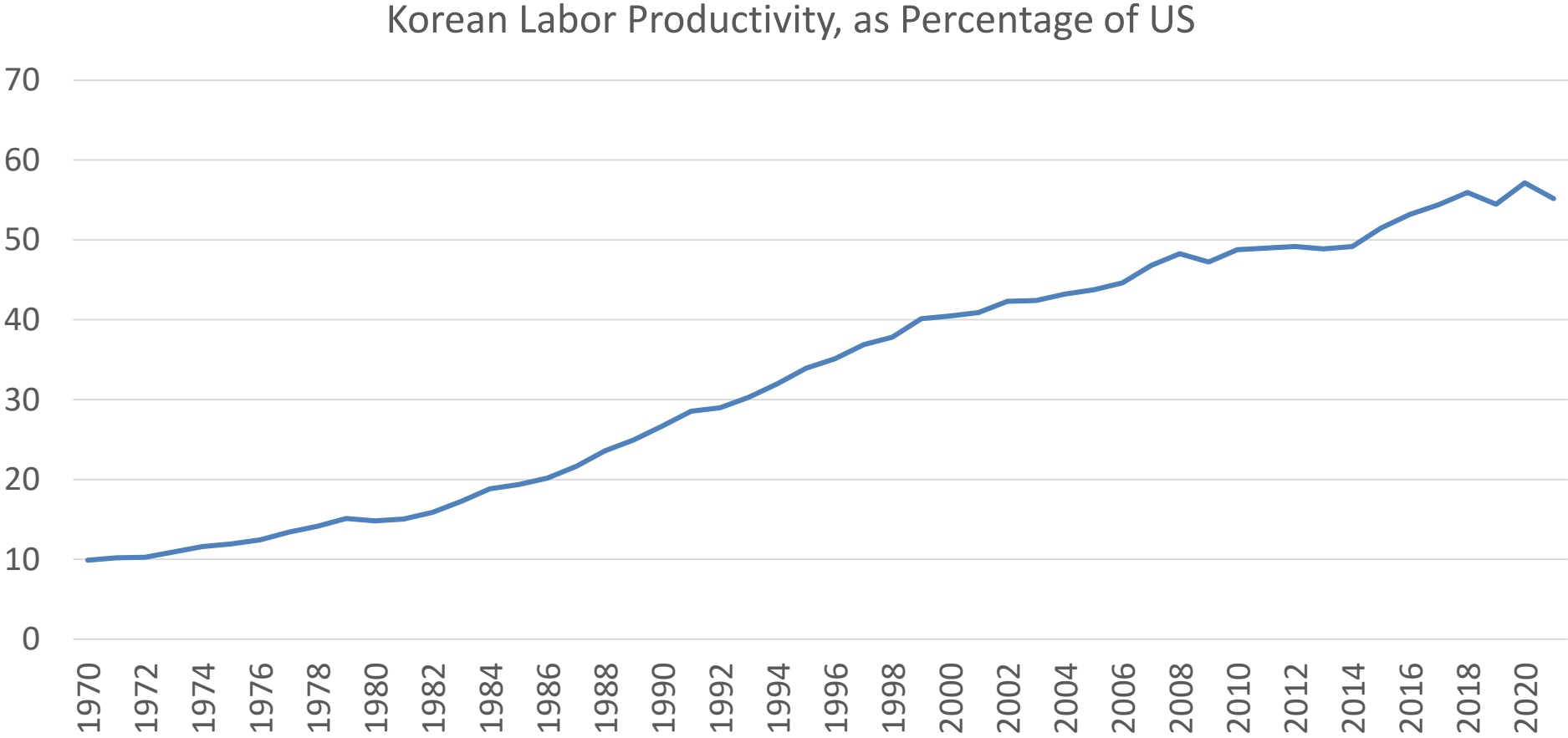
Korea has been a productivity outperformer, even during a time of slow productivity growth (though still has suffered its own slowdown, as many economies)

Average annual growth rate of labor productivity (output per hour):

	1995-2004	2004-2021	2010-2021	2019-2021
Korea	5.5%	3.5%	2.9%	2.8%
G7	2.1	1.0	1.0	1.3
OECD	N/A	1.0	1.2	1.4
EU	1.9	0.9	1.1	0.8
US	2.5	1.3	1.0	2.3

Korea Has Been a Productivity Outperformer (But Is Slowing)

This has lead to productivity convergence with frontier, although at slowing rate:

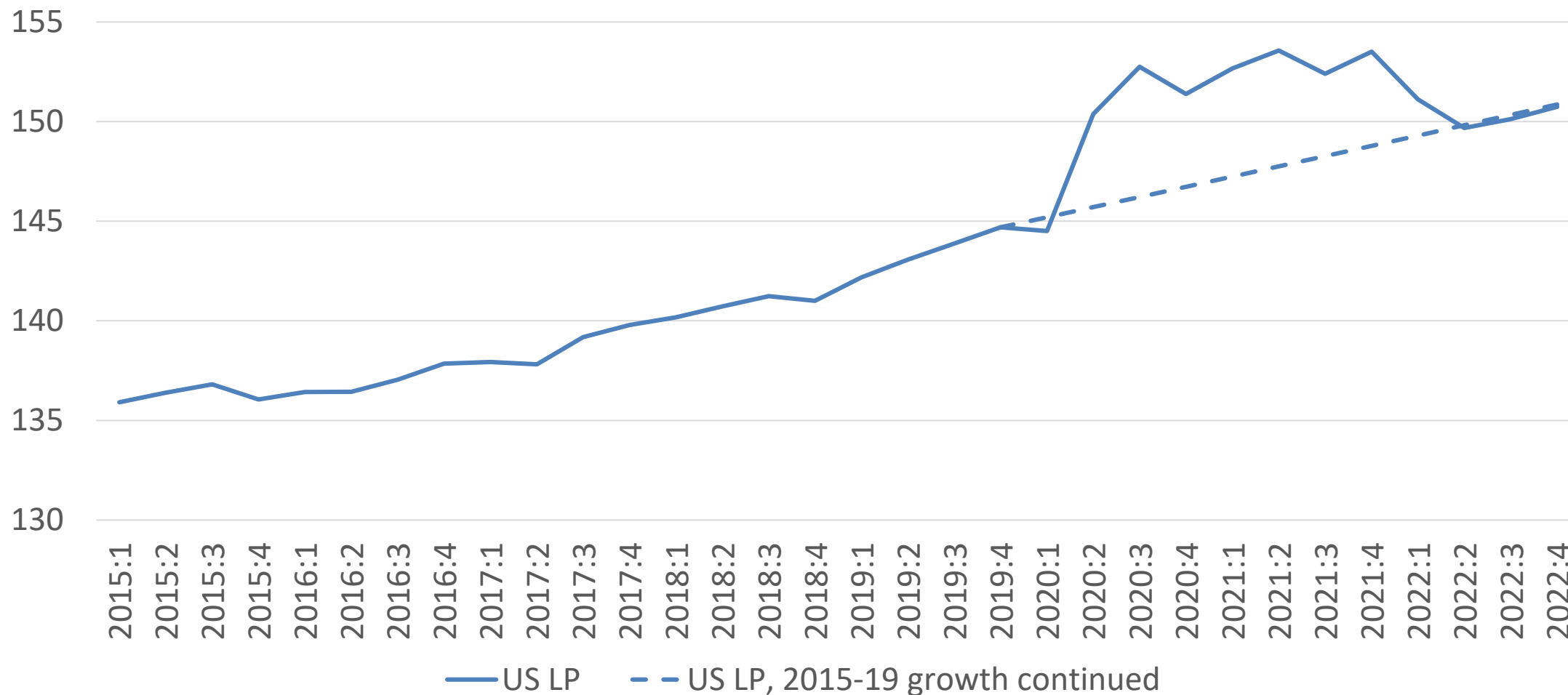


Is There an Optimistic Case to Be Made?

- The worldwide productivity trends of the past 15 years have been discouraging
- But there is an *data-driven* optimistic case to be made
- Note, however, this is a *case*, not a prediction

Coming Out of Covid

U.S. Labor Productivity, Actual and Counterfactual



Dynamism

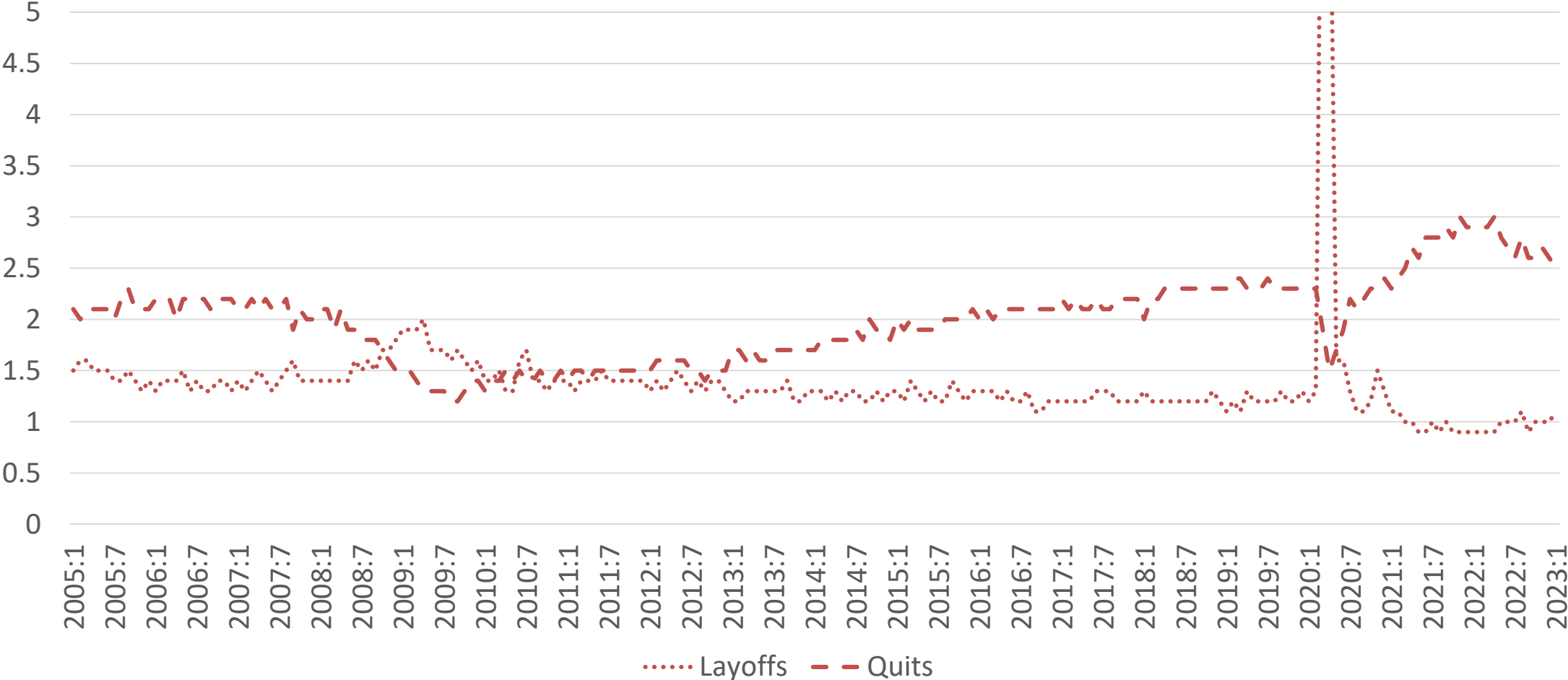
- Enormous productivity dispersion, even within narrowly defined markets
- Enormous churn—dynamism—within industries
- Dynamism usually interacts with productivity differences to raise average productivity in an industry/market through “between” effect
- Competition is empirically related to dynamism
- Concern: Covid forbearance programs may have stalled or misdirected useful churn

Dynamism: Recent Trends Are Encouraging

	2015-2019	2022
Average hires + separations rate, U.S.	7.4	8.1
Job-to-job flows rate, U.K.	2.5	3.1
Quits per layoff, U.S.	1.8	3.1
Business formations, U.S. (millions)	3.2	5.1
“High propensity” business formations, U.S. (millions)	1.3	1.7
Business formations, KOR (millions)	0.9	1.0

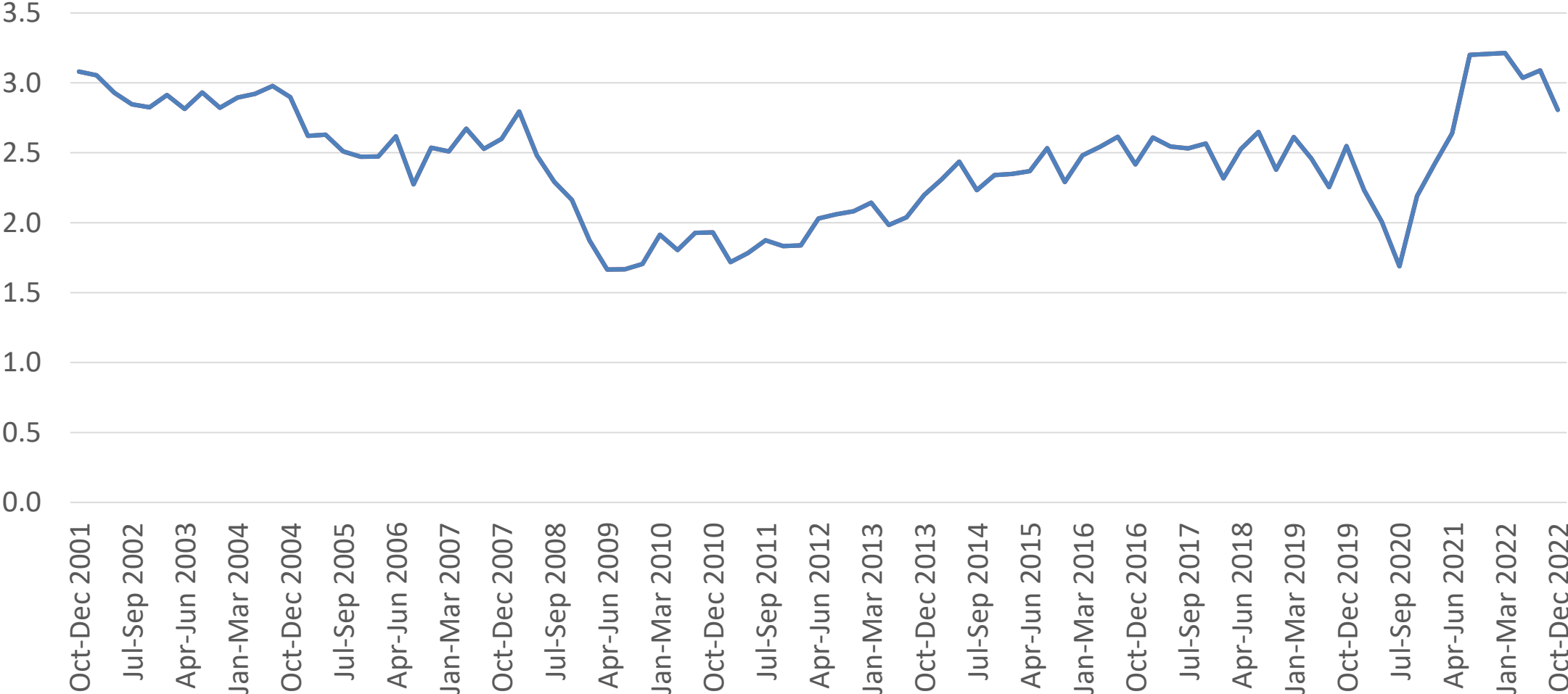
Dynamism: Recent Trends Are Encouraging

US Monthly Job Separations, by Layoffs and Quits (% of Employment)



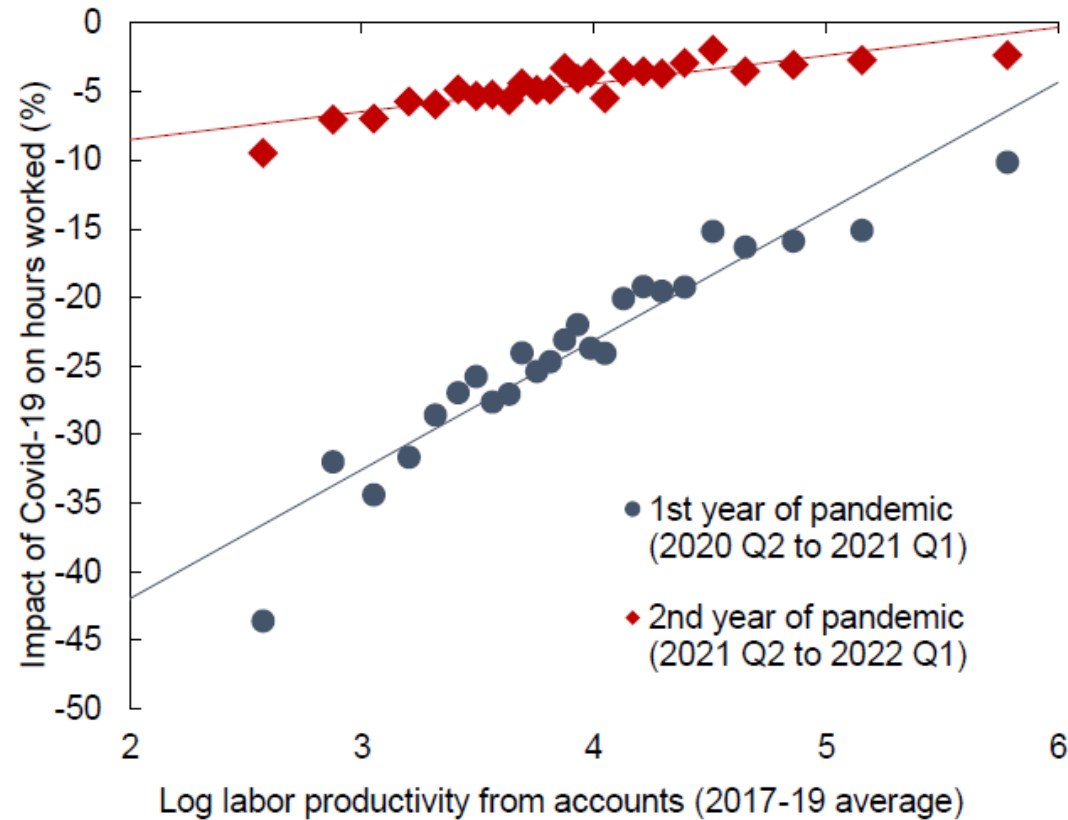
Dynamism: Recent Trends Are Encouraging

UK Job-to-Job Flow Rate (%)

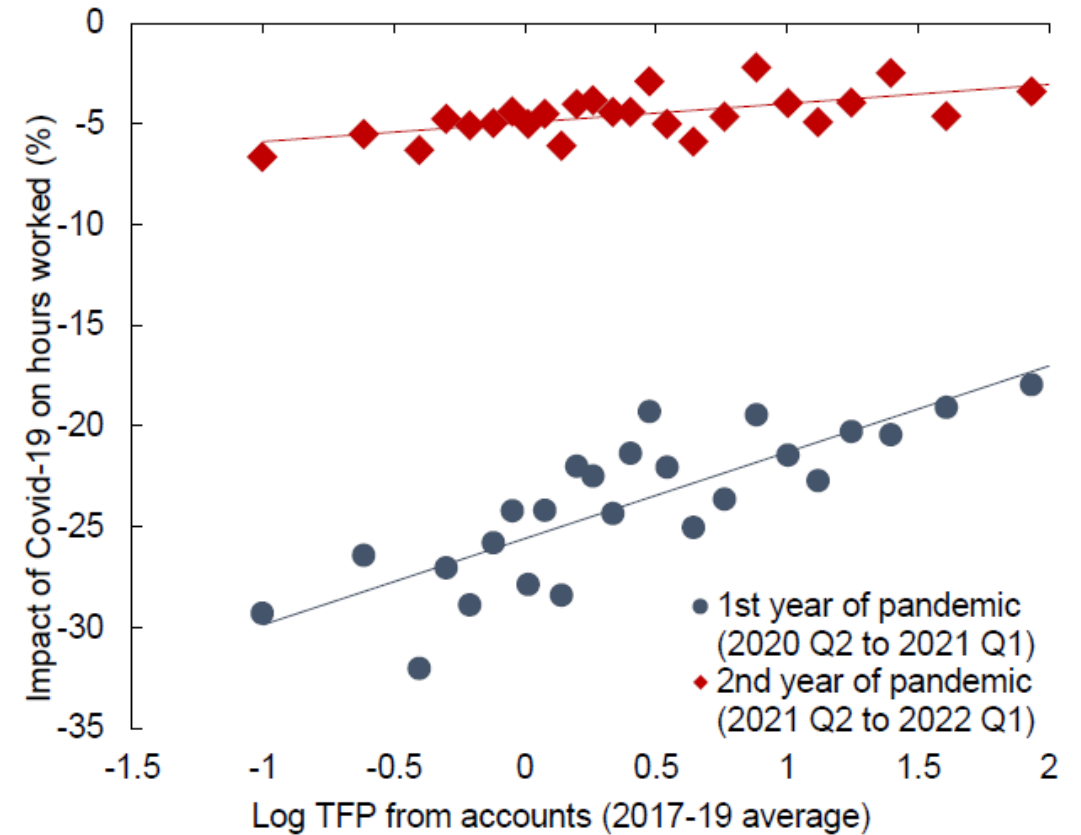


Churn-Productivity Interaction Still “Works”

Panel A: Labor productivity per hour



Panel B: TFP



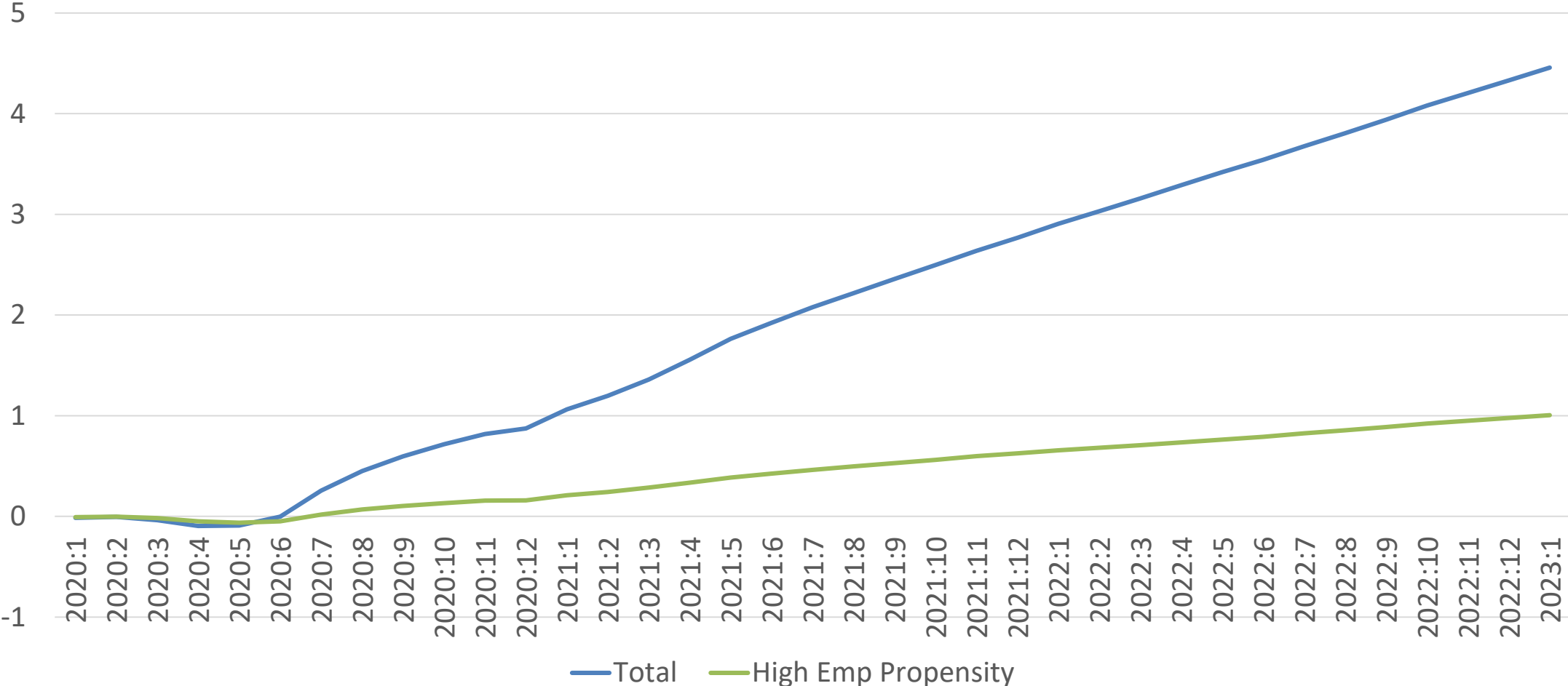
Encouragingly Strong Business Formation

U.S. Monthly New Business Applications, 2018-Pres (1000s)

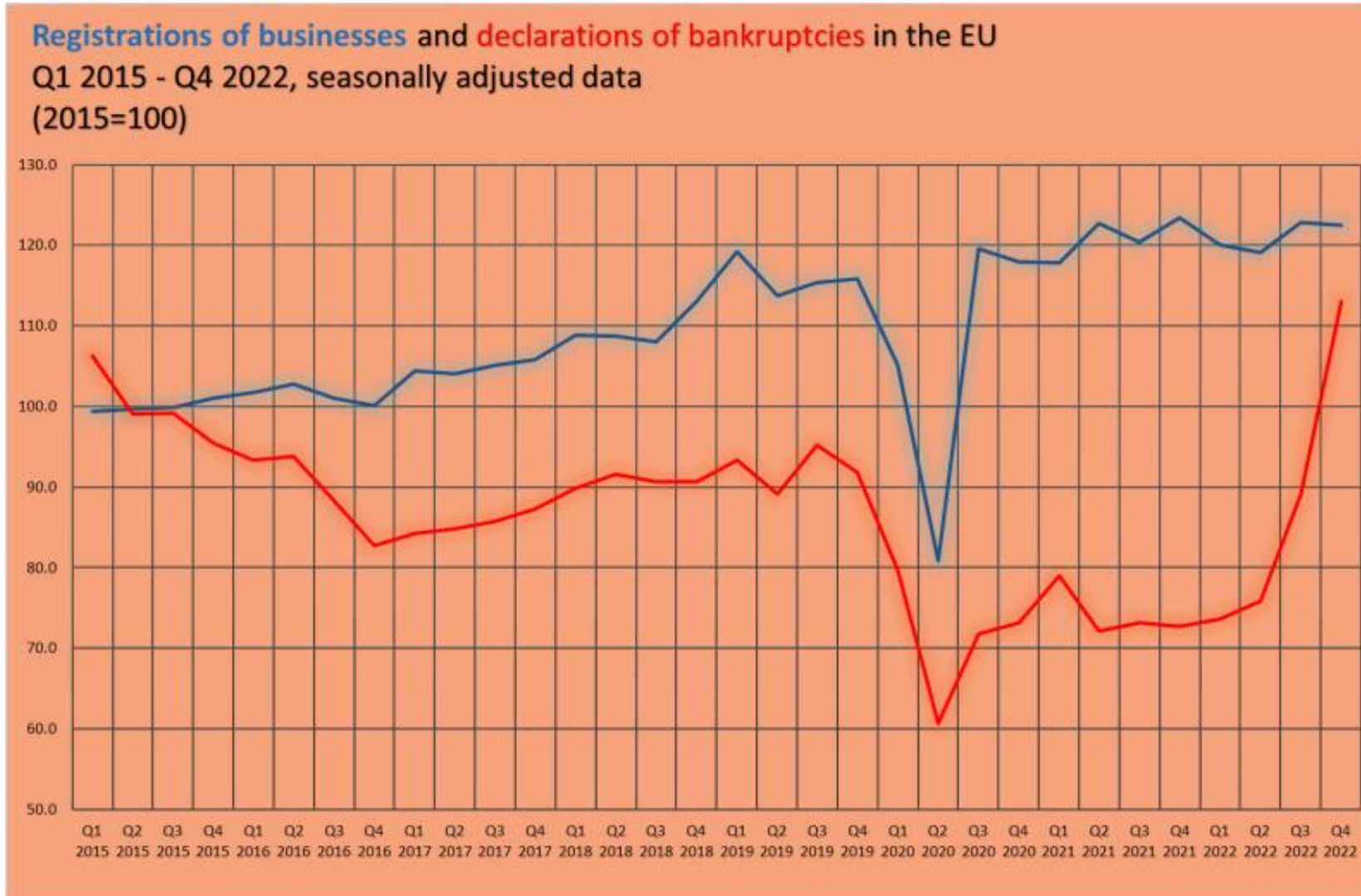


Encouragingly Strong Business Formation

U.S. Cumulative Applications above 2018-19 Trend (millions)



Encouragingly Strong Business Formation (Sort of)



The J-Curve: Intangibles and Productivity Measurement

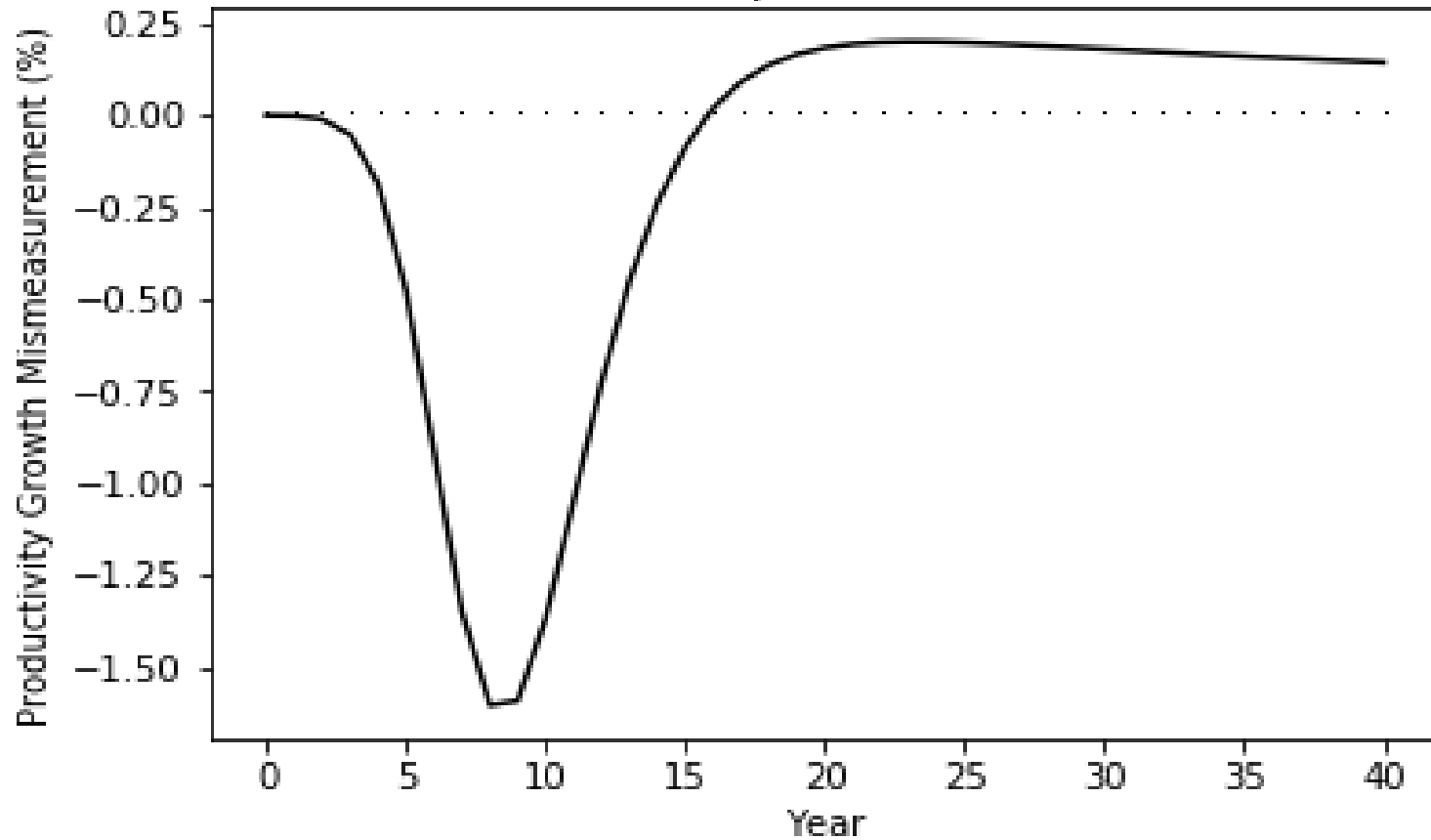
How do intangibles affect productivity measurement?

$$Productivity = \frac{Output}{Input}$$

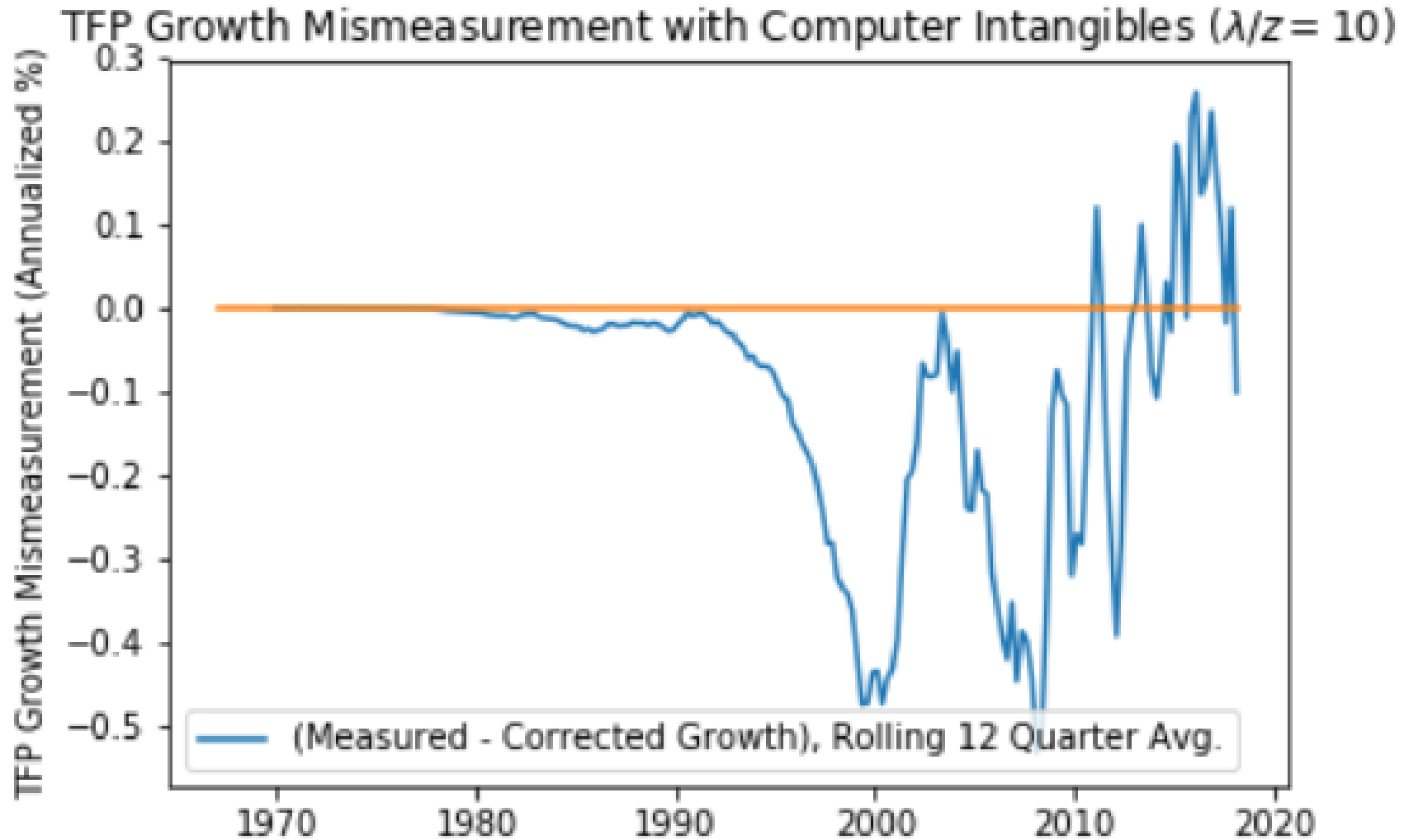
- Intangible capital would be an unmeasured input
 - Will cause productivity to be overstated
- However, intangible capital is also an output (measured as investment flow)
 - Will cause productivity to be understated
- Net effect depends on relative timing of input vs. output mismeasurement

The J-Curve

Toy Economy: The Productivity Growth Mismeasurement J-Curve
Calculation of Capital Share as $1 - (wL/Y)$



The J-Curve: IT Hardware in the U.S.



J-Curve and Covid: Intangibles

- Necessity is the mother of invention: Covid spurred massive experimentation by firms
- Knowledge gained—new processes, new notions of what works and doesn't, new insights about suppliers and customers, etc.—is intangible capital
- Experimenting firms now have two production functions from which to choose
- Outer envelope of the two PFs must be superior to the prior one alone
- This intangible capital production was probably booked mostly as expenses

AI-Related Intangibles Example

- Still very early in AI adoption, but fast investment growth
- Estimated U.S. AI investments of \$95B in 2021, 200% growth since 2016
- Suppose each observed dollar of AI investments were correlated with \$2 of additional intangible investments (plausible; see Brynjolfsson et al. 2021)
- This would add \$190B (0.8%) to 2021 U.S. GDP
- Real GDP growth declined 0.76% between the 1999-2007 and 2011-2019 periods
- This would explain one year's "lost" GDP
 - Though earlier AI investments probably too small for aggregate effects, so only recent part of story

