

CBO's Economic Forecast: Understanding Productivity Growth

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Robert Shackleton

Macroeconomic Analysis Division

The Purpose of CBO's Economic Forecast

The forecast is used primarily as an input to CBO's 10-year federal budget projections and analyses of legislative proposals.

It is a **current-law** forecast:

- It incorporates the assumption that legislation will not change but that changes in policy built into current legislation will occur.
- For example, current tax law provides for the expiration of certain provisions within the next 10 years.
- CBO's current forecast projects economic responses to the expiration of those provisions.

CBO's Approach to Forecasting

CBO's approach involves projections of:

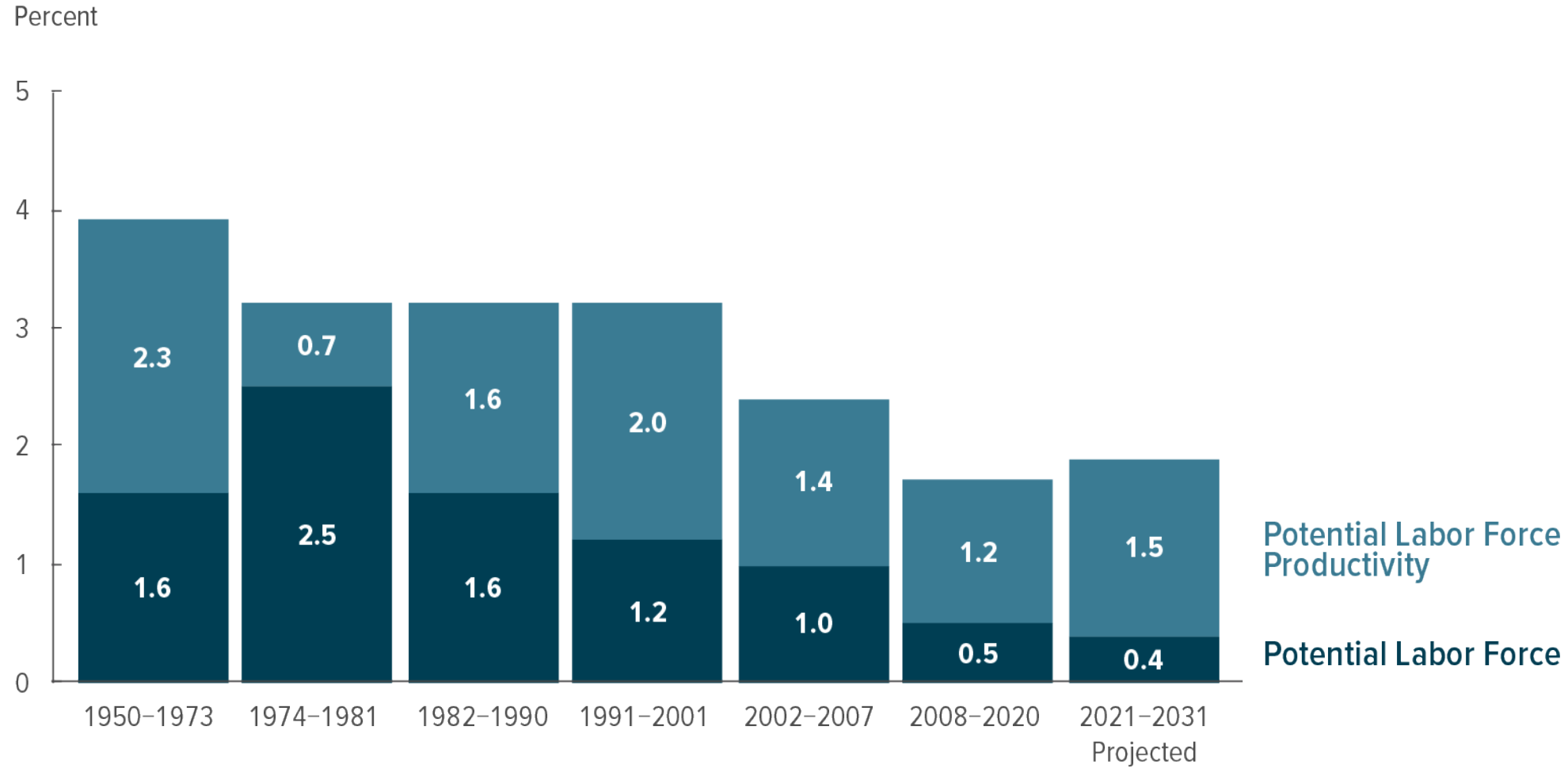
- **Potential (maximum sustainable) output** in a neoclassical growth framework and
- **Actual output** in a standard macroeconomic model.

The estimate of potential output is mainly based on estimates of:

- The potential labor force,
- The flow of services from the capital stock, and
- Potential total factor productivity in the nonfarm business sector.



Average Annual Growth of Real Potential GDP

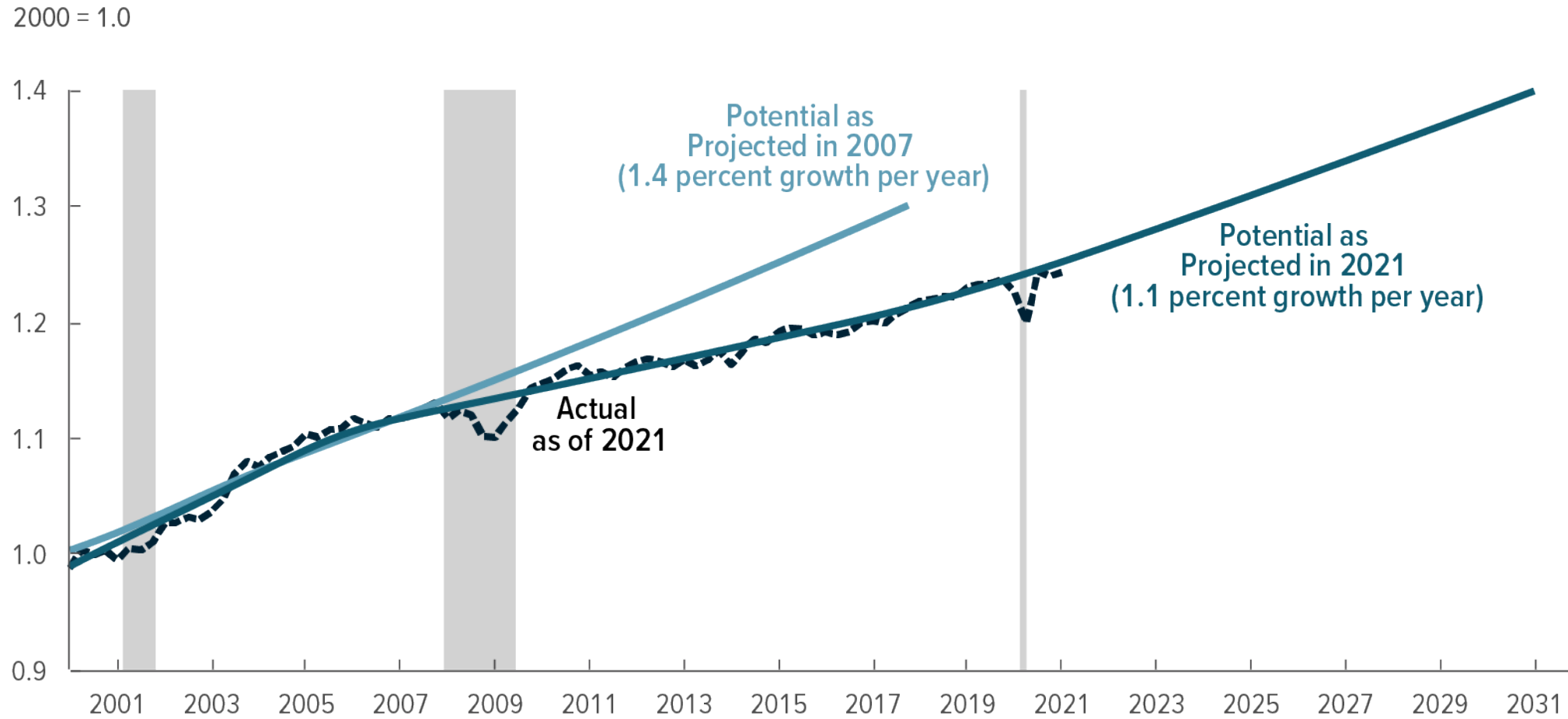


Key Estimates in CBO's Projection of Potential GDP, July 2021

Average Annual Percentage Growth, by Calendar Year	Historical Periods							Projection
	1950– 2020	1950– 1973	1974– 1981	1982– 1990	1991– 2001	2002– 2007	2008– 2020	2021– 2031
Overall Economy								
Potential Output	3.1	4.0	3.2	3.2	3.3	2.4	1.7	1.8
Potential Labor Force	1.4	1.6	2.5	1.6	1.2	1.0	0.5	0.4
Potential Labor Productivity	1.7	2.3	0.7	1.6	2.0	1.4	1.2	1.5
Nonfarm Business Sector								
Potential Output	3.4	4.1	3.5	3.5	3.7	2.7	2.0	2.1
Potential hours	1.3	1.4	2.3	1.7	1.2	0.3	0.6	0.4
Capital services	3.4	3.8	3.7	3.5	3.9	2.8	2.3	2.3
Potential total factor productivity	1.4	1.9	0.8	1.1	1.5	1.5	0.8	1.1
Potential Labor Productivity	2.1	2.6	1.2	1.7	2.4	2.4	1.4	1.8



Total Factor Productivity in Nonfarm Business Since 2000



Vertical bars indicate the duration of recessions.

The Effects of the Pandemic on Total Factor Productivity

The 2020–2021 coronavirus pandemic had very large short-term effects on total factor productivity (TFP). But the decline in TFP was relatively small when compared with the decline in employment.

- Social distancing sped the adoption of new technologies, such as teleconferencing and telemedicine.
- It is not clear whether that acceleration was a one-time occurrence that simply pushed ahead changes that would have occurred soon anyway.

The longer-term effects on TFP are very unclear.

- Innovations associated with working from home could lead to substantial reductions in costs and improvements in productivity in some sectors.
- Productivity improvements could lead to a decline in measured GDP (because of less commuting and less consumption associated with office work).
- Conversely, disruptions to the education system could have lasting effects on the future productivity of workers.

Why Has the Growth of Total Factor Productivity Slowed Over the Longer Term?

The slowdown began around 2005, before the financial crisis and the resulting recession.

It is widespread among industries and international in scope.

Five areas of inquiry might shed light on the slowdown:

- Measurement issues
- Growth feedbacks
- Demographic effects
- Structural issues
- A slowdown in basic innovation

The Slowdown of Growth of Total Factor Productivity: Measurement Issues

Mismeasurement of real (inflation-adjusted) inputs and outputs is persistent.

However, measurement issues can account for only a small portion of the slowdown of total factor productivity growth:

- Mismeasurement does not appear to be worse than it was in the past.
- Products no longer measured in output have relatively modest value to consumers compared with “missing” growth in total factor productivity. An example is digital photographs, which have largely replaced printed ones and do not show up in GDP.
- Measurement errors related to international supply chains are thought to explain less than 0.1 percentage point of the slowdown of growth of estimated total factor productivity per year.

The Slowdown of Growth of Total Factor Productivity: Growth Feedbacks

Growth of the labor supply has slowed dramatically.

Aggregate demand recovered slowly in the aftermath of the 2007–2009 recession.

Both developments have led to relatively modest demand for capital investment.

The net result is slower turnover of the capital stock and slower introduction of new technologies.

However, there is little evidence of a backlog of technology.

The Slowdown of Growth of Total Factor Productivity: Demographic Effects

Highly skilled and well-educated baby boomers are retiring, lowering the aggregate level of human capital.

However, skilled and experienced workers tend to stay in the labor force longer, pushing up the average skill level.

Educational attainment has grown more slowly than in previous generations because it is already at a high level.

However, educational attainment among younger cohorts has continued to improve, especially during the 2007–2009 recession and its slow recovery.

The Slowdown of Growth of Total Factor Productivity: Structural Issues

There is declining dynamism in the economy:

- Top firms in many industries continue to have strong productivity growth, but other firms increasingly lag behind.
- Rates of firms' entry and exit have declined.
- The share of employment and output accounted for by young firms (historically a source of productivity growth) has fallen.

But there is no consensus on the causes:

- Are barriers to entry getting higher?
- Are product markets becoming less contestable?

Restrictive land-use regulations increasingly raise housing costs and discourage workers from migrating to denser urban areas, where most growth in productivity occurs.

The Slowdown of Growth of Total Factor Productivity: A Slowdown in Basic Innovation

The pessimistic view:

- Innovation from the late nineteenth century through the early 1970s was unique and unsustainable.
- Acceleration in total factor productivity during the 1990s and 2000s was a temporary deviation related to information technology.
- We are “running out of ideas”: Research costs are rising, and new ideas are not as economically significant.

The optimistic view:

- The pool of potential innovators and the potential market for products are now global.
- Research tools are greatly improved.
- Communication of innovations is much more rapid.
- Major advances in technology can be expected—but because they diffuse slowly, their economic impact will take time.

Additional Information

Congressional Budget Office, *Additional Information About the Updated Budget and Economic Outlook: 2021 to 2031* (July 2021), www.cbo.gov/publication/57263.

Robert Shackleton, *Estimating and Projecting Potential Output Using CBO's Forecasting Growth Model*, Working Paper 2018-03 (Congressional Budget Office, February 2018), www.cbo.gov/publication/53558.