Productivity Gains, How Permanent?

by Paul W. Bauer, Jeffrey L. Jensen, and Mark E. Schweitzer

Recent measures of economic output show the economy has slowed dramatically, suggesting the current expansion may be coming to an end. While many are now awakening to the possibility that even the “New Economy” may experience negative output growth, it is impossible to ignore productivity’s exceptional performance over the last five years. The accelerated growth we have seen was largely unanticipated outside of ardent proponents of the “New Economy.” Regardless of the fate of this expansion, productivity growth is a key factor in all long-term economic forecasts, and policymakers responsible for planning various spending may now need to reevaluate their assumptions about long-run productivity growth.

Accurate forecasts of future productivity growth are important because even small changes have big effects over time. For example, a half-percent increase in productivity growth may sound small, yet it could add $1.2 trillion to the 10-year forecast of the federal budget surplus. Social Security solvency estimates are also dramatically altered by assumed rates of productivity growth. That same half-percent increase would cut the cost of a 50-year fix to Social Security in half. Indeed, any estimates of gross domestic product more than a few quarters into the future critically depend on what one assumes productivity will be.

By contrasting patterns of productivity growth over postwar expansions, this Economic Commentary shows the varied views policymakers may draw about the likely future pattern of productivity growth. In doing so, we update and expand the analysis of a prior Economic Commentary, “Productivity Gains During Business Cycles: What’s Normal,” written in July 1998. At that point in the current expansion, productivity had only just begun to show signs of unusually large late-cycle growth. Using similar statistical techniques, we show that this acceleration has continued over the last few years. We also examine some of the factors that contribute to productivity growth in order to understand better what might have led to the current surge and what is likely to occur in the future.

Postwar Productivity Growth

Two things obscure the pattern of productivity growth over the business cycle. First, productivity data are inherently noisy—more technically, the series’s variance is large relative to its level compared to other major economic data series. Second, the length of past expansions varies greatly. To reveal the underlying productivity trend over the business cycle, a smoothing procedure must be used. Figure 1 shows the results of this procedure, which allows us to contrast the pattern of the current expansion with a statistical synopsis of the previous seven postwar expansions.

In a typical expansion, productivity growth starts quite rapidly, only to slow for the remainder of the expansion. This pattern has, of course, not been exactly repeated in every expansion. A way to envision the variability of the smoothed estimates is to plot the 95 percent confidence band (see figure 1). The band widens sharply toward the end of expansions because few expansions last that long. Because only one other expansion lasted longer than 37 quarters, we stop plotting the band at that point. There is no question that this expansion has been unusually long-lived.

Contrasting the current expansion with the smoothed statistical synopsis of previous expansions reveals the extraordinary nature of the last few years. Until the twenty-third quarter, this expansion appears to have been fairly typical, but in 1996, productivity growth surged at an unexpectedly rapid rate. Consequently, the attention devoted to productivity growth over the last few years has been well justified.

What remains unknown is whether this surge reflects conditions unique to this expansion or more permanent factors. In other words, how likely are future expansions to be like this one? Yet this information is key for predicting long-run outcomes accurately. Unfortunately, no amount of past data can completely relieve the policymaker from this fundamental uncertainty. In light of this, we try to constrain the uncertainty by showing how different the predictions for productivity growth over the business cycle can be, depending on how they’re calculated.
Looking to the Future

Predictions for the path of productivity growth depend on which parts of our history we assume are more relevant or likely to repeat. We consider three alternative assumptions we could reasonably make when forecasting future productivity growth. Conservative policymakers (option 1) might assume that the current expansion is an anomaly and base their forecasts on postwar data through 1991. Note that this is the same as the typical expansion in figure 1, as neither uses information from the current expansion. Averaged over the full business cycle (including the recession quarters), the conservative option predicts annual labor productivity growth of 1.8 percent. Even this option is somewhat more optimistic than prevailing views prior to this expansion, because most forecasts would have included a productivity slowdown term of about –0.6 percentage point, to account for the marked slowing in productivity growth in post-1973 expansions. The productivity slowdown no longer appears to be a permanent feature of the U.S. economy, and including an ad hoc adjustment only makes the current expansion more difficult to reconcile with the past data.

Another alternative would be for policymakers to employ all the available productivity data, and thus treat the current expansion as simply one of nine available business cycles (option 2, neutral). Under this option, labor productivity growth is expected to average 2.5 percent over the business cycle, in part because longer periods of productivity growth are expected.

Lastly, policymakers might adopt a view, in the spirit of New Economy proponents, that information from the 1973–91 slowdown should be fully discounted, because, some would argue, the economy is now on a permanently faster growth path. Constructing a forecast without this period yields our third alternative (option 3, aggressive). This assumption again raises the productivity growth forecasts in the later quarters. Nonetheless, this much more optimistic option only increases estimated long-run productivity growth over the business cycle to 2.8 percent, because longer cycles are already included and the estimates for early quarters are not substantially altered.

It is clear that the way we treat the data from the 1973–91 productivity slowdown and the current expansion makes a significant difference to the forecasts in the three options. Of course, more aggressive forecasts are possible by further emphasizing the last expansion, but historical evidence is still a reasonable constraint for something as hard to predict as productivity growth.

Sources of Labor Productivity Growth

Which of these three assumptions is most reasonable? Understanding the sources of productivity growth might suggest an answer.

Overall labor productivity growth is the sum of the gains from capital deepening (an increase in the capital-to-labor ratio), from changes in input quality (the result of better trained or more experienced workers), and from multifactor productivity (an estimate of technological change often referred to as the Solow residual).3 The Bureau of Labor Statistics calculates the most widely reported measure of multifactor productivity
female labor force participation.

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ductivity into its various components.

(Confidence)

MFP requires more data to calculate
relative infrequency of reporting is that
MFP is less widely known and
produced than labor productivity because it
is only available annually and, until
recently, has been released only bienni-
ally. The reason for the delay and the
infrequency of reporting is that
MFP requires more data to calculate
than labor productivity, which requires
estimates of output and labor input,
both of which are available quarterly. In
addition to output and labor, MFP also
requires an estimate of capital, which is
available only annually.

Table 1 presents the latest available fig-
ures for the decomposition of labor pro-
ductivity into its various components.
From the table, it is clear that the main
cause of the 1973–91 slowdown was a
sharp decline in MFP. This is unfortu-
nate because, being the residual, it is the
least predictable component. A much
smaller share of the slowdown came
from stagnant growth in labor quality, as
baby boomers first entered the job mar-
et and a surge of women returning to
work after caring for children increased
female labor force participation.

The contribution of capital deepening
was relatively stable over these periods.
In the long run, it seems likely that cap-
tal deepening will continue to con-
tribute around 0.8 percentage point to
overall productivity. Also, with no
bulge in the demographic distribution and
a strong emphasis on education and
job training, the contribution of labor
quality should continue at about 0.3
percentage point. The big question is
what will happen with MFP, but unfortu-
nately, these numbers cannot tell us.
Recent papers have sought to address
this deficiency by reconsidering the
strength of capital deepening in the
economy, particularly in information
and communication technologies. This
research has generally focused on iden-
tifying assumptions used to calculate
the national income and product
accounts that may be inappropriate for
research has greatly
clarified the importance of investments in
information and communications technolo-
gies in the latest expansion. The research
has lowered MFP growth in later years to
a more typical rate, attributing about half
of the extra MFP growth over the last
five years to capital deepening. Even so,
this still leaves policymakers to ponder
not only whether this information-and-
communications-technology-led capital
deepening is sustainable but also whether
the other half of the unaccounted-for extra
gains in MFP growth will persist as well.
These uncertainties keep this approach
from dramatically narrowing the range of
forecasts proposed earlier.

Comparison with Other Forecasts
We now compare our three options for
estimating future labor productivity growth
with some other prominent forecasts
(see table 2). Note that most of the organi-
izations considered have boosted their
forecasts for productivity growth since the
early 1990s. The exception is the Social
Security Administration, which has held to
its 1.0 percent long-run forecast throughout
this period. At 2.7 percent, the Congress-
ional Budget Office is the most optimistic
at about the same rate as our aggressive
forecast. The Council of Economic Advi-
sors’ forecast is a little more cautious,
projecting only 2.3 percent growth, in line
with our neutral option. The Organisation
for Economic Co-operation and Develop-
ment is the second most optimistic at
2.5 percent, the same as our neutral option.
How should policymakers proceed? We
have shown that most of the recent increase
in labor productivity comes from MFP
growth, which cannot be traced to a spe-
cific, identifiable cause. The Social Secu-
rit y Administration’s 1.0 percent estimate
appears to be too low. It is not only below
all three of our options, but also capital
deepening and labor quality alone should
be able to deliver at least this rate of
growth. How much higher an estimate
one chooses depends on how permanent
the recent MFP growth gains are assumed
to be. Of course, policymakers will have
to periodically revise their forecasts as
new information becomes available.

Conclusion
Despite the recent revision of previous esti-
mates, the current expansion clearly has
generated abnormally large late-cycle gains
in labor productivity, which may indicate a
shift to a higher trend rate of productivity
growth. Alternatively, the recent surge could

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<td>2.2</td>
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<td>1.4</td>
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<td>0.8</td>
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<td>0.8</td>
<td>0.5</td>
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<td>Contribution of labor quality</td>
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<td>0.2</td>
<td>0.0</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
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<tr>
<td>Multifactor productivity</td>
<td>1.2</td>
<td>1.9</td>
<td>0.4</td>
<td>0.3</td>
<td>0.6</td>
<td>1.1</td>
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| TABLE 2  ESTIMATES OF LONG-RUN PRODUCTIVITY GROWTH |
| --- | --- | --- | --- | --- |
| Congressional Budget Office | 1.3 | 1.7 | 2.3 | 2.7 |
| Council of Economic Advisors | 1.8 | 1.3 | 2.0 | 2.3 |
| OECD | N/A | 1.9 | 2.2 | 2.5 |
| Social Security Administration | 1.0 | 1.0 | 1.0 | 1.0 |
| Conservative | 1.8 | | | |
| Neutral | 1.0 | 1.0 | 1.0 | 1.0 |
| Aggressive | 2.5 | 2.8 | | | |
be a one-time event. In making forecasts of future productivity growth, it is prudent to be cautious. Few forecasted the 1973 slowdown, and few predicted productivity’s current resurgence. In any forecast, one would be well advised to consider the net cost of forecast error. For example, when planning for your retirement, assuming a high rate of return for your investments enables you to save less and spend more now, but the cost comes in the future when you may not have the resources that you planned to have. Of course, there is also a cost to assuming too low a rate. You end up saving too much, needlessly cutting your consumption now.
