Inflation and Growth: Working More vs. Working Better

by Michael F. Bryan

Economic growth springs from two sources: either we work more or we improve our productivity. It is important to distinguish between the two origins of growth because they have different implications for public welfare. Economic growth that stems from productivity is unquestionably beneficial; it creates both wealth and leisure time. Growth derived from effort creates wealth at the expense of leisure time, the welfare implications of which are uncertain.

This Economic Commentary examines trends in the sources of growth and argues that inflation alters the long-term composition of growth in a detrimental way. Inflationary periods are shown to correspond with periods of relatively lower productivity growth and greater work effort.

Taking a Look Around
Growth in the current economic expansion, at an inflation-adjusted or real rate of just under 4 percent per year, has been comparable to the 4.4 percent average of the previous five expansions since 1955 (figure 1).\(^1\) But by how much has the current expansion benefited the typical U.S. worker? Regrettably, the record here has been below par. Real income per worker, for instance, has grown relatively slowly during the current expansion (0.7 percent annually vs. 1.7 percent for the previous five expansions). Likewise, the growth rate of real hourly compensation in this expansion has been about 1 percent less per year than the average of other expansions of the past 35 years. Indeed, in terms of the growth rate of real GNP, expansions since 1955 have been remarkably similar, deviating from the average rate by no more than 1 percent per year and showing no clear trend. However, the record of recent expansions clearly shows a decreasing propensity to generate real gains per worker, or per hour of work.

The record of recent economic expansions shows that work effort has supplanted productivity as a source of growth. Inflation may be one of the prominent causes of this trend, because it promotes errors in resource allocation and discourages capital development, eventually leading to loss of wealth in the economy. Instead of producing a faster rate of economic growth, then, higher rates of inflation reduce economic welfare by causing us to work harder rather than better.

In a competitive environment, workers' income is commensurate with their contribution to the economy. Simply put, workers take from the economy a sum equal to the value of their output; over time, their hourly earnings should reflect their hourly output, or productivity. It follows, then, that the downward trend in the growth of real hourly earnings stems from a decline in the growth of productivity, a pattern that is strongly supported by the data (figure 2). Similarly, the failure of compensation to keep pace with total output suggests that recent expansions have been associated with slower productivity growth and a rise in the growth of total hours worked, or "work effort."
Examination of the relative contributions of work effort and productivity to the trend growth rate of real private output, shown in figure 3, reveals that a striking shift has occurred in the origin of growth. In the early 1960s, nearly all of the trend growth in the economy came from improved productivity. During the 20 years that followed, the role of productivity diminished and work effort became an increasingly important source of growth; by the late 1970s, virtually all of the private growth trend was the result of greater work effort.

The trend decline in productivity growth is one of the more puzzling and, admittedly, more controversial issues in the analysis of recent business cycles. But there seems to be sufficient evidence to claim that inflation may be one of its more prominent causes. To understand how inflation affects productivity, we need to appreciate the damage that inflation inflicts on an economy.

Prices are the mechanism by which markets allocate an economy’s resources. Specifically, price increases guide additional resources to markets, while price decreases direct resources away from markets. These market signals, or relative price movements, are the primary channel through which market information is transmitted and are therefore
vital to the operation of markets. Inflation, however, has nothing
to do with the transmission of market
information, but is instead a general
reduction in the purchasing power of
money.
If unanticipated, inflation can be mis-
interpreted as a relative price signal,
making the transmission of market
information less accurate and leading to
errors in the allocation of resources.
Inefficiency is compounded as time and
other resources are redirected into the
wasteful enterprise of filtering inflation-
ary noise from prices. Even if anticipated,
inflation may impede productivity
growth as households and firms are
forced into various protective
maneuvers.

There may also be a link between infla-
tion and productivity growth through
the tax code. A recent study indicates
that fully anticipated inflation reduces
the after-tax rate of return on human
and physical capital in a substantial
way and thus discourages capital
development.

These linkages between inflation and
productivity suggest that inflation
reduces an economy’s potential output
by reducing its accumulation of
resources—its wealth. One possible
implication is that the inflation-induced
reduction in wealth may be compen-
sated for by an increase in work effort.
In this way, we might think of the
growth implications from inflation in
the same light as we do a natural dis-
aster. When Hurricane Hugo swept
through the Southeast last fall, it caused
losses of billions of dollars in property
damage and in lost work time. Accord-
ing to many estimates, though, the hur-
ricane actually had a small net positive
impact on real GNP growth. How does
a natural disaster produce growth?
One response is that the economy is
called upon to repair buildings and
other damaged structures. But this
answer isn’t particularly appealing,
because it assumes surplus resources
are ready and waiting for a disaster to
call them into service (not to mention
the frightful policy implications). A
more sensible explanation is that the
substantial wealth loss caused by the
catastrophe prompts people to work
harder than they otherwise would.
That is, households are motivated to
sacrifice some of their leisure in order
to rebuild. It follows, then, that as infla-
tion lowers the trend in productivity
growth, it diminishes the nation’s
wealth potential, part of which will be
compensated for by an increase in
work effort.

- It Takes All the Running You
  Can Do
The rate of inflation and the growth
rates of output, productivity, and hours
for the expansionary years between
1951 and 1989 are shown in figures 4a
to 4c. Over this period, no statistically
significant relationship between inflation and output can be detected, a result that seems broadly consistent with previous research on the impact of inflation on trend real GNP growth. Yet a significant, negative correlation can be found between inflation and productivity growth. Specifically, for every 1 percentage point of inflation, productivity growth in expansions has tended to decline by 0.3 percent. Further, the inflation-induced drop in productivity growth seems to have been offset by an equal rise in work effort.

If we separate work effort into four components—the length of the workweek, the rate of labor-force participation, the size of the working-age population, and the level of surplus unemployment—we can identify more clearly the source of the additional effort. While the association is somewhat crude, there has been a strong tendency for the rate of labor-force participation to rise and fall with the rate of inflation (figure 5). Linkages between the rate of inflation and the other sources of work effort were unsubstantiated by the data.

### Correlation, Causality, and Other Caveats

The patterns outlined in the previous section show correlation between inflation and the origins of growth, but in all fairness, there has been no demonstration of causality. Thus, we must ask whether the increase in effort or the slowdown in productivity growth could be "causing" inflation. One way to address these issues is through a simple supply-and-demand framework. An increase in aggregate spending could explain rising hours, lower productivity, and higher prices if resource markets respond sluggishly to changes in aggregate conditions. But if aggregate spending is driving hours growth and reducing the marginal productivity of labor, the growth rate of output would tend to rise with the rate of inflation. No such relationship was found.

Alternatively, it could be that the decline in productivity resulting from other factors might cause a rise in infla-
FIGURE 5 INFLATION AND TREND LABOR-FORCE PARTICIPATION

NOTE: Inflation is measured by the implicit price deflator (annual changes). The trend in the labor-force participation rate is for civilian workers. Trend changes are calculated over a five-year period.


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Footnotes

1. This excludes the disputable two-quarter mini-expansion of 1982.

2. Work effort is defined as total hours worked in nonfarm business, and productivity is defined as output per hour in nonfarm business.


4. Some examples of protective maneuvers include the redistribution of assets from debt to equity, increased costs of cash management, greater business inventory investment, and increased contracting costs.


6. It has been suggested by a colleague that inflation also reduces the rate of return on physical capital relative to human capital, and so causes a substitution between productivity and effort in production.

7. Surplus unemployment is defined as the residual between the growth rate of total hours and the growth of the workweek, the working-age population, and the participation rate.

8. This effect was also documented by Browne, who found that the labor-force participation rate of women is positively correlated to the rate of inflation. See Lyne E. Browne, “Why Do New Englanders Work So Much?” New England Economic Review, Federal Reserve Bank of Boston, March/April 1990, pp. 33-46. New entrants into the labor force in recent years have predominantly been adult women. There are many possible explanations for the rise of women in the labor force, such as important legislative changes and higher education levels, to name but a few. These “causes” need not be competing views to the inflation hypothesis presented here. This hypothesis would seek only to include inflation as one important catalyst to these other explanations.


12. This is borne out by the statistical evidence. Changes in the inflation rate are associated with only about 19 percent of the variation in hours growth and 24 percent of the variation in productivity growth.

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The views stated herein are those of the author and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.