
The Coming of Peak Gross Domestic Product?

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Could economic growth come to an end in the next fifty years? Think whimper, not bang: A civilization-ending catastrophe isn't what I have in mind. Instead, the question is whether in the United States and other advanced countries growth as we have come to understand it could simply exhaust itself.

Speculation along these lines has become popular in the years since the Great Recession. Economist Robert Gordon (2012) of Northwestern has argued provocatively that the best days of technological innovation are already behind us. Meanwhile, Lawrence Summers (2014) of Harvard raises the prospect of “secular stagnation,” in which a mismatch between savings and investment results in chronically anemic aggregate demand.

I want to explore another possibility. Let's assume that innovation continues to chug along and that opportunities for private investment suffice to keep secular stagnation at bay. Even so, I see a couple of scenarios in which growth as conventionally understood might come to an end. In both cases, the mechanism for growth's demise is the same: an ongoing decline in labor hours per capita. But whether this decline would be cause for celebration or sorrow depends on which workers reduce their labor hours and why.

When we talk about economic growth, we are typically referring to growth in the value of gross domestic product (GDP)—or, more precisely, to growth in real (i.e., inflation-adjusted) GDP per capita. To be sure, it is an imperfect measure. The calculation of GDP for any given year rests on a host of difficult methodological

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decisions; resolving those methodological issues in other, equally plausible ways would result in very different final figures. Just as daunting, if not more so, is the challenge of converting changes in nominal GDP from year to year into increases or decreases in real output. The price indexes used to make the conversion are increasingly sophisticated, but adjusting for quality improvements and the introduction of entirely new products ultimately comes down to educated guesswork.

Notwithstanding these difficulties, my judgment is that trends in real GDP do give us useful information about changes in the overall size of the “cash nexus”—that is, the market value of traded goods and services. Although some argue the point, I don’t believe the measurement problems are getting worse over time; if anything, unmonetized welfare gains (what economists refer to as consumer surplus) were probably much bigger in the past. Consider, for example, the colossal improvements in well-being made possible by the rapid increase in life expectancy during the first half of the twentieth century. According to calculations by Kevin Murphy and Robert Topel of the University of Chicago, between 1900 and 1950 those gains alone were roughly equal to the value of all measured output (2006, 891). I am quite confident that this unmeasured leap in material welfare dwarfs all the considerable thrills we get out of our smartphones these days. So if the numbers say that growth in GDP per capita is declining or has stopped, I think those numbers are telling us something important.

GDP per capita can be broken down into two basic components: labor hours per capita and output per worker-hour. Accordingly, if labor hours per capita start to decline, output per worker-hour must rise just to keep GDP from shrinking. Growth can occur only if the rise in labor productivity (output per worker-hour) outpaces the fall in labor hours.

The decline in labor hours per capita is no mere theoretical possibility. Between the first decade of the twentieth century and the early 1960s, annual hours worked per capita fell from more than 1,000 to less than 800 as the workweek shortened and young people exited the workforce to attend high school and, increasingly, college (Lindsey 2013, fig. 2). During this period, productivity growth was so robust, however, that real GDP per capita grew at roughly 2 percent a year in spite of the curtailment in work effort. From the mid-1960s to the end of the century, the combination of the Baby Boom and surging labor-force participation by women drove annual hours worked per capita back up again, ultimately exceeding 950 in 1999–2000. Productivity growth slowed markedly during this period, but the increase in work effort sufficed to keep overall real per capita output growth averaging 2 percent a year.

Since 2000, however, labor hours have resumed their decline. The Baby Boomers now are exiting the workforce, and women’s as well as men’s labor-force participation has been falling during the new century. With productivity growth also softening, leading forecasts for the upcoming decade or so suggest a drop-off in the long-term growth outlook from the historical norm of 2 percent annual growth to

something in the range of 1 to 1.5 percent (Lindsey 2013, table 3). If labor hours continue on their downward trajectory, we will eventually reach the point of “peak GDP,” after which the cash nexus will actually begin to contract.

There is absolutely no theoretical reason why this couldn’t happen. Economists analyze the effect of economic growth on labor supply as a tug of war between the “income effect” (the rise in purchasing power caused by an increase in real wages) and the “substitution effect” (the change in relative prices caused by an increase in real wages). When their incomes rise, workers are faced with a choice: What do they buy with the extra money? Do they buy extra goods and services that they previously couldn’t afford? Or do they, in effect, buy leisure instead, working less to consume the same product mix as before?

Economists generally think of leisure as a “normal good”—as income rises, people want more of it (as opposed to “inferior goods”—say, Ramen noodles or public transportation—consumption of which can be expected to decline as income rises). Accordingly, the income effect leads people to want to buy more leisure as their real wages rise. The substitution effect, however, cuts in the opposite direction: the relative price of leisure goes up with rising wages as the opportunity cost of extra leisure (i.e., the amount of money you give up by not working) is now higher than before. Which effect wins out? Economic theory is silent on the point. In any given case, the outcome turns on personal preferences.

Since the rise of the modern mass-production economy in the late nineteenth century, the historical pattern has been for American workers to split the difference. Over this period, a large share of real-wage gains has been consumed in the form of more leisure. According to economic historian Robert Fogel, when you include the imputed value of leisure as part of consumption, the share of total consumption devoted to leisure skyrocketed from 18 percent in 1875 to 68 percent by 1995 (2004, table 4.4).

It should be noted that the move toward more leisure has doubtless been encouraged—sometimes deliberately, sometimes not—by public policy. Thus, Social Security has facilitated earlier retirement, and compulsory education and subsidies for schooling have worked to delay entry into the workplace. Meanwhile, numerous social programs offer benefits either not contingent on working (e.g., food stamps, housing assistance) or actually contingent on joblessness (e.g., Social Security Disability Insurance). These policies have thus accelerated the underlying trend.

Nevertheless, the explosion of new and improved goods and services over the past century and more has dissuaded Americans from taking it too easy. Although working life now starts later (because of more time in school) and ends relatively earlier (because of increased years spent in retirement), the forty-hour work week has remained the norm for more than seventy-five years. And since 1970 the percentage of employed men working more than fifty hours a week has actually risen considerably—a phenomenon concentrated among highly skilled top earners (Francis 2006).

But, as the saying goes, past performance is no guarantee of future results. Over the next half-century, the balance between the income effect and the substitution effect may shift decisively in favor of the former. In that event, economic growth as we currently conceive of it will come to an end.

Note that flat or declining GDP per capita need not mean the end of technological innovation or of new and improved products. Productivity growth can continue so long as labor hours decline as quickly or more quickly. Furthermore, well-being can keep improving in ways that don't show up in or are only partially registered by GDP statistics. The natural environment can be made cleaner and more beautiful; the privations and social exclusion of the poor can be mitigated; family and community life can become richer, deeper, and more satisfying; the boundaries of scientific knowledge can continue to be pushed back.

And huge, unmonetized welfare gains in the form of improved health and longevity remain possible. Imagine, for example, the advent of anti-aging therapies that become widely and inexpensively available. GDP per capita might shrink to the extent that the enormous and growing sums now spent on the diseases and complications of aging are no longer necessary, even as longevity gains that dwarf those of the twentieth century catapult well-being to new heights.

The great engine of human progress in the modern era—the division of labor through specialization and exchange—has been mediated largely within the cash nexus. But that won't necessarily be the case in the future. The new connectivity catalyzed by information technologies allows collaboration among strangers on a scale and at a level of sophistication that in the past was possible only when money changed hands. Think about open-source software or the free-culture movement or *Wikipedia*. As futurist Clay Shirky has noted, *Wikipedia* represents something like 100 million hours of human effort—compared to the 200 *billion* hours Americans spend cumulatively watching television every year (2010). Working with the enormous “cognitive surplus” of free time, as Shirky calls it, online tools have the potential to transform more and more of our leisure from passive consumption into active collaboration and creation.

This sunny picture of the possibilities of life after peak GDP rests on particular assumptions about why labor hours per capita continue falling. In this optimistic scenario, people “graduate” from the workforce into higher-value (in terms of well-being, not GDP) uses of their time. The relative attractions of working instrumentally for money recede as more and more of life's purchasable pleasures are attainable with less and less work effort; meanwhile, the possibilities for pursuing happiness outside the cash nexus proliferate as improved techniques for specialization and exchange without money changing hands boost the welfare “productivity” of leisure. Under these circumstances, the income effect of rising real wages gains sufficient ground against the substitution effect to extinguish per capita GDP growth—and people are better off as a result.

There is, however, a darker alternative scenario. Here, people don't graduate from the workforce; they instead drop out. Speculation is buzzing these days about

the possibility of mass technological unemployment, as Moore's Law continues in operation and the capabilities of robots and other smart machines keep improving exponentially (see, e.g., "Onrushing Wave" 2014; Ford 2015). This prospect can be described as "capital-biased technological change": capital substitutes for workers across the skill spectrum, and the share of total national income going to labor falls over time.

Boys have been crying about this big bad wolf since the days of Ned Ludd. Perhaps the wolf is finally at the door, but the scenario I have in mind doesn't depend on anything so exotic and unprecedented. Rather, all that is needed is the continuation of the "skill-biased technological change" we have today, in which new technology (especially information technology) acts as a complement to high-skill workers (i.e., it increases their productivity and raises relative demand for them) but as a substitute for less-skilled laborers.

On the one hand, surely it is a good thing that economic life is growing less dependent on backbreaking manual labor and mindless clerical tedium. On the other, much of American society is failing to adapt to the new economic realities. Unstable families and a dysfunctional educational system produce large numbers of people with no valuable work skills and no real capacity to develop them. Meanwhile, automation and other technological progress keep whittling away at the best-paying mid-skill and low-skill jobs (because that's where the biggest cost savings are), forcing more workers to compete for the remaining less-attractive jobs they are qualified to do and therefore intensifying downward pressure on those wages.

Over time, then, more and more people with limited job skills find that the material welfare offered by life on the dole compares favorably to what they could earn in the labor market. And the increasing productivity of the high-skill sector, boosted by the same technological advances that reduce employment opportunities for the unskilled, allows society to carry a growing idle class at public expense. Accordingly, labor-force participation falls as discouraged low-skill workers drop out of the job market and live off public assistance.

This dynamic is already occurring. Wages for the less skilled have been stagnant or falling for decades now. According to calculations that paint a relatively sunny picture, wages for male high school dropouts fell 11 percent between 1973 and 2012, and those for high school grads rose only 4 percent. The most widely cited statistics, meanwhile, are even bleaker.¹ (However, it should be noted that these figures omit benefits such as health insurance, which have increased as a percentage of total compensation over time.) And although labor-force participation for all men has been falling, the drop has been concentrated among the less skilled. Between 1969 and 1999, as labor-force participation overall was reaching its historic high, the

1. The calculations I present use the Personal Consumption Expenditures price index to adjust for inflation. The Consumer Price Index is more commonly used to adjust for inflation, but it is widely believed to overstate inflation and thus to understate growth in real wages.

participation rate for “prime-age” (twenty-five- to fifty-four-year-old) white males with college degrees inched down from 98 to 96 percent, and the rate for black prime-age college grads dipped from 94 to 92 percent. The numbers for prime-age male high school dropouts look very different: the participation rate for whites fell from 95 to 83 percent, and for blacks it dropped from 91 to 61 percent (Juhn and Potter 2006, table 3). As work effort falls, dependency rises. Thus, the percentage of adults ages twenty-five to sixty-four receiving benefits from Social Security Disability Insurance has shot up from 2.3 percent in 1989 to 5.0 percent in 2013 (Duggan 2015).

Here, then, we are not talking about rising real wages that lead more and more people to opt for self-financed leisure. Here we are talking about flat or even declining real wages that increase the relative appeal of taxpayer-financed joblessness. This dynamic doesn’t involve the interplay of income effect and substitution effect; the relevant economic concept here is the “reservation wage,” the minimum pay that will motivate a worker to take a job. If market wages for the unskilled fall or the level of public support rises, more and more workers will find that their market value is lower than their reservation wage, and so they will exit the labor market accordingly.

In this scenario, greater leisure doesn’t lead to improved well-being. After all, the same cognitive, interpersonal, and motivational skills needed for success in the workplace are equally necessary for “productive” leisure. Labor-force dropouts who lack the skills for workplace success are therefore unlikely to put their free time to good use. Instead of enjoying creative, productive, and often highly organized leisure, discouraged workers are much more likely to fall into an inescapable trap of idleness, dissipation, disconnection, and anomie. Time-use studies show that the jobless don’t use much of their extra free time to better themselves or to serve their communities. Instead, most of that extra time is consumed sleeping longer and watching a lot more TV (U.S. Bureau of Labor Statistics 2014, table 8).

Again, none of this is hypothetical: it is happening right now. All it takes is extrapolation to get to the end of economic growth. If current trends continue, the idle class could grow large enough that labor hours per capita no longer suffice to keep real GDP per capita on an upward path.

So will either of these growth-ending scenarios actually come to pass? For what it’s worth, my bet is no. As to the first option, I expect the hit parade of new and improved commercial products to continue with sufficient allure that workers will be enticed to maintain their labor hours at growth-consistent levels. As to the second option, I suspect that political constraints on providing public assistance to people who don’t work will be binding enough to prevent expansion of the idle class from swallowing economic growth.

Nonetheless, I think it’s instructive to ponder these possibilities. Both scenarios, after all, are spun from trends clearly visible today. It is useful, then, to project what the world would look like if these trends were to continue and accelerate. What becomes apparent, especially from the juxtaposition of the two possible futures,

is that individual human flourishing—not rising GDP per capita—ought to be the ultimate object of our concern. Although the two have been linked since the Industrial Revolution, they need not always remain so. In our individual lives, when making decisions about what we now call work–life balance, we frequently make choices that further our individual welfare but reduce GDP per capita. We should be alert to the possibility that our collective choices might someday have the same effect.

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