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The Mismeasurement of Europe's Productivity

di Philippe Aghion, Antonin Bergeaud e Luis Garicano

The Nobel laureate economist Paul Krugman uses the wrong metric—purchasing power parity—to make the case that Europe is not lagging far behind the US in terms of productivity. The right metric shows that the gap is growing.

PARIS—In a recent series of Substack posts, the Nobel laureate economist Paul Krugman made a counterintuitive argument to support the view that Europe is not suffering any productivity decline relative to the United States. Instead, Krugman argues that Europe's output per hour relative to America's has stayed roughly flat for 25 years if we use current purchasing power parity (PPP) to compare the US and European economies.1

That sounds reassuring. But while touting Europe may make sense in the American context (we agree that "Trump is bad, Europe is better"), Krugman's argument lends support to all those who claim that no major change in European growth and innovation policy is required. The problem is that current PPP is being wrongly used to make that case.

Don't get us wrong. We live in Europe, and we love Europe. Europeans live longer, work less, and enjoy social protections that many Americans envy. No one should reduce a society's worth to its GDP. But the question Krugman raised is narrower: has European productivity growth lagged American productivity growth? On that question, the PPP argument is misleading.

What PPP Actually Measures

PPP is useful for comparing purchasing power across countries at a specific point in time. But a sequence of current-PPP comparisons is not automatically a measure of real growth, because the prices used to value output change from year to year.

Since 1986, *The Economist* has published its "Big Mac" index, which records the price of a McDonald's Big Mac hamburger in every country and uses it to ask whether currencies are expensive or cheap. Suppose a Big Mac costs $6 in the US and €5 in the eurozone. At a market exchange rate of $1.10 to the euro, the European burger costs $5.50, meaning the euro is a bit undervalued. For a Big Mac to cost the same in both places, the euro would have to strengthen to $1.20 per euro. This is the PPP: the exchange rate implied by what money actually buys.

A PPP is a form of exchange rate, built from the prices of actual goods rather than from financial markets. It is a comparison across space, frozen at one moment. The Big Mac example works because the product is unusually standardized: a Big Mac in France and a Big Mac in the US are close enough that comparing their prices tells us something meaningful about relative purchasing power.

But this is the exception, not the rule. Most products are not so neatly comparable across countries. They differ in quality and in how representative they are of what people actually buy in a particular country. That is why Nobel laureate economist Angus Deaton famously said in 2010 that "PPP comparisons between widely different countries rest on weak theoretical and empirical foundations." You could string together 25 years of Big Mac indexes, but you would not be measuring how much more France produces today than in 2000. You would be measuring how the relative price of one fairly standardized product changed across countries. That is moderately useful for comparing economies at a particular moment, but useless as a measure of total output growth over time.

The US sold far more in 2024 than it did in 2000, but some of the larger number is due to inflation, not to higher output. To remove the impact of inflation, a country's statisticians build a deflator: an index of how domestic prices have moved, year by year, so that higher prices are not mistaken for higher production. The deflator answers a different question from the Big Mac index. It asks how much more the US produced in real terms, after adjusting for price changes.

PPP compares places at one date. A deflator compares dates in one place. Both are price indexes, so it is tempting to assume they fit together cleanly. But a current-PPP trajectory changes the yardstick every year: each year's output is valued using that

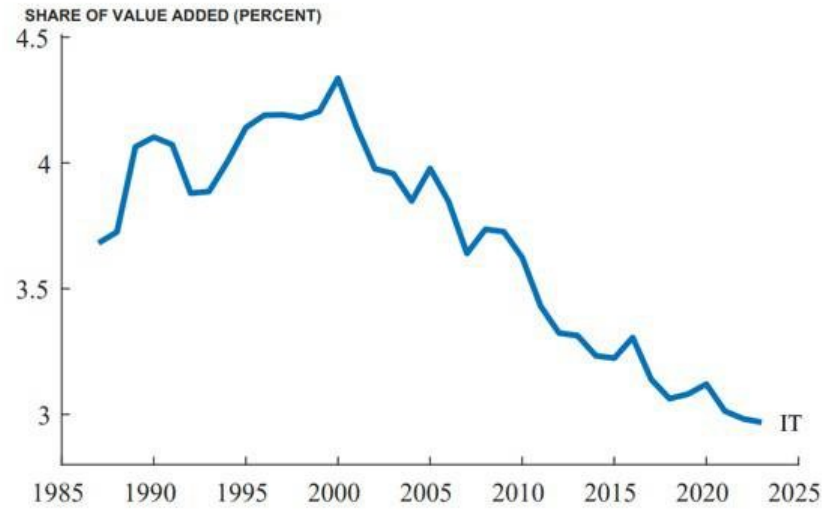
year's international price system. When the PPP path and the national deflator path diverge, current-PPP growth mixes changes in quantities with changes in the prices used to value those quantities. In a 2017 article with Bettina Aten, Deaton warned against using PPP to make time comparisons. He pointed out that "in 2014, the [International Comparison Program] published PPPs from the 2011 round that are sharply different from those that were expected from extrapolation of the previous round, ICP 2005." In turn, the 2005 round had reduced the estimated size of the Chinese economy by 40%.

Why the Yearly Comparison Hides the Gap

Krugman cites the finding by the Federal Reserve Bank of Chicago that information technology comprises about 8% of US private-sector output but accounted for about 45% of all American productivity growth since 1988. This is exactly the kind of sector where measurement is difficult. The volume produced has exploded, the price per unit has collapsed, and the quality of the products has changed enormously.

There are two ways this can create a wedge between current PPPs and national growth measures. The first is a weighting issue. If the US produces more of the goods whose prices fall rapidly, then valuing both economies at today's prices can make part of the earlier volume gain look smaller. The following chart, from a May 2026 paper by Charles Jones and Christopher Tonetti, shows that the increase in the quantity of computers sold occurred simultaneously with an even larger decrease in the price of computers, lowering computers' share of value-added in the US economy.

Factor-Income Share of Information Technology in the US Private Sector



Source: Jones and Tonetti (2026) with data from the Bureau of Labor Statistics.

But there is a second, more structural problem: There may be no single index of products that is simultaneously representative within each country, comparable across countries, and stable through time.

Consider mobile phones. A PPP comparison would ideally compare the price of the same phone in France and the US. That sounds simple if both countries sell the same iPhone model. But even then, the relevant product may differ in terms of the contract provisions, taxes, distribution, or other variables affected by regulation.

Things get even more complicated once we move from standardized products to categories shaped by local tastes. Comparing Brie cheese in Paris with cheddar in Chicago would be meaningless. But comparing only Brie in both countries would also be misleading, because Brie may be representative in France and niche in the US.

Now add time. The national deflators ask how the price of mobile-phone services and devices in France changed between 2023 and 2024, after adjusting for changes in quality. That requires comparing old and new models, deciding how much of a price difference reflects better cameras, faster processors, more storage, or longer battery life, and tracking changes in what consumers actually buy.

The quality adjustment enters the two exercises in a different way. A national deflator must compare products through time. If this year's phone is more expensive than last

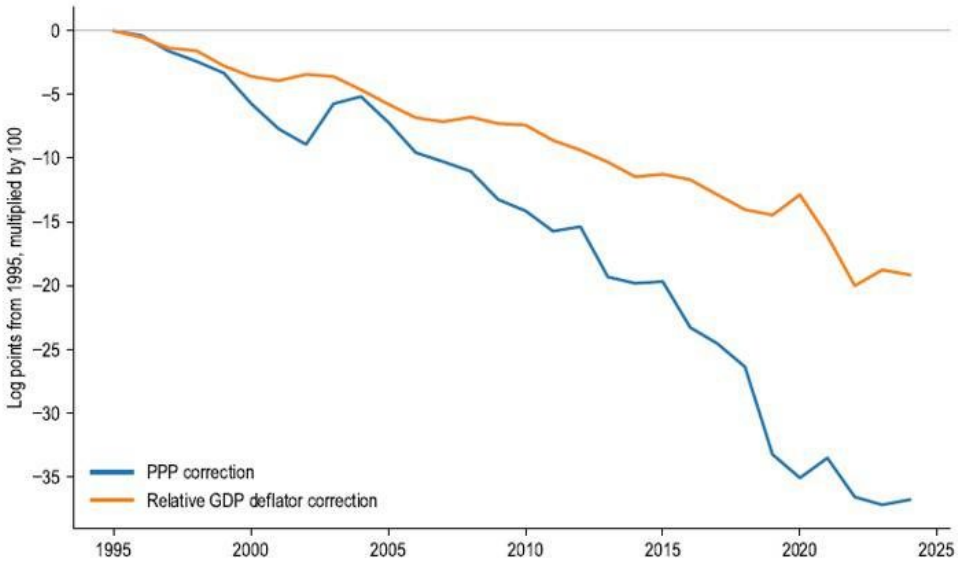
year’s phone, the statistician must decide how much of the increase is true inflation and how much reflects higher quality.

By comparing products at the same date, PPP tries to avoid that problem. If the same phone is sold in France and in the US in 2024, the PPP survey can compare the two prices directly. It does not have to ask whether the 2024 phone is better than the 2023 phone, but whether French and US American products are sufficiently similar at that date.

This is why PPPs and national deflators can diverge even when both are well constructed. The national deflator adjusts for quality change over time, while the PPP comparison relies much more on product matching across countries at a point in time. When exact matches are unavailable or unrepresentative, the PPP comparison is solving a different problem than the price deflator. The products that can be followed cleanly over time may not be the same as the products that can be matched cleanly across space.

The disagreement between these two measures is shown in the chart below, which compares two lines, each set to zero in 1995. The blue line is the actual France-US PPP as their statistical agencies build it each year. The orange line is what that parity would have been if you had taken the 1995 figure and simply carried it forward using each country’s own deflator—its own inflation. If the two indicators measured the same thing, the lines would be on top of each other: the cross-country comparison would just be the old comparison plus the accumulated difference in inflation.

PPP vs. National Deflators France and the US



Source: OECD.

The lines track together until about 2005, then split—and keep splitting. By 2024, they are roughly 18 log points apart. That gap is large enough to neutralize the entire measured growth divergence between France and America. Current PPPs and national deflators are giving sharply different answers to what at first sight looks like the same price question, but as we saw, is not.

Seven Time Series, One Conclusion

The table below puts the issue in perspective. The first seven rows report standard real labor-productivity growth: GDP is transformed using national deflators, from national accounts and related datasets. The last row reports growth in output per hour when GDP is converted every year using current PPPs.

Productivity Growth Since 1995

Source	France (%/yr)	United States (%/yr)
National accounts (INSEE and BEA)	+0.85	+1.93
EU KLEMS	+0.96	+2.13
OECD	+0.94	+1.74
Bergeaud, Cette, and Lecat	+0.80	+1.71
Gethin and Saez	+1.19	+1.61
Andreescu, Loubes, Piketty, and Robilliard	+0.91	+1.79
Conference Board	+0.79	+1.79
World Bank current PPP / PWT hours	**+3.75**	**+3.89**

The first seven rows are the product of different teams, different datasets, and different methods, though most ultimately rely on national accounts. They agree that US productivity has grown substantially faster than French productivity for three decades.

Now read the last row. Convert GDP every year with a current PPP, as in the Krugman-style calculation, and, voilà, French output per hour grows at a similar rate to the US.1

Why It Matters

Contrary to Krugman's argument, the US lead in technology and innovation is not helping America and Europe in the same way. It has led to higher US wages and profits, and the gap is widening each year.2

So, Europe's productivity problem is not an accounting issue. As Krugman himself once famously remarked, "productivity isn't everything, but in the long run, it is almost everything." Productivity growth pays for everything Europe wants to keep. It is what allows countries to raise wages, fund a welfare state, rearm, finance the green transition, and support research at the technological frontier.

We Europeans should not attempt to persuade ourselves that we do not have a real problem by confusing productivity levels with growth. We have real weaknesses, as Mario Draghi's report on European competitiveness documented—and as all researchers and international institutions find every time they look.

In our view, these findings are not controversial. The European Union's markets are too fragmented. Europe's firms remain too small. Its capital markets are insufficiently

deep. And its technology, particularly digital tools, diffuse too slowly. And Europe has too few technology companies built to global scale.

These are policy choices, not fate, and they can be changed. But we in Europe will fail to change them if citizens and leaders persuade themselves that the productivity gap is an illusion because one price index makes it look smaller.

PPP is a useful instrument. It tells us what money buys in different places. But a sequence of current PPPs changes the valuation benchmark over time, and therefore cannot by itself settle a question about real productivity growth. Europe should defend what it does well. But we should be upfront about where and why we are falling behind. Otherwise, we will not cure what ails us.