



# US-China: Who Is Bigger and When

By Derek Scissors

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## Key Points

- When will China pass the US in economic size? “The year 2030” is not a bad estimate, but so is “never.”
- Claims that China’s economy is already the world’s largest may be exaggerated by up to 30 percent. They are also dubious because purchasing power parity often does not hold. National wealth is not well measured, either, but shows the American lead expanding.
- The more popular belief that China is smaller than the US but will catch up soon is similarly unconvincing. Chinese government statistics are unreliable, since Beijing publishes sanitized data and many transactions may be close to worthless.
- More important, projections of Chinese growth are sensitive to unjustified optimistic assumptions. Debt and aging indicate true Chinese growth is lower than reported, and low growth now could put off Chinese catch-up indefinitely.

When will China pass the US in economic size? The near-universal belief that the People’s Republic of China (PRC) has already passed or is soon to pass the US in size<sup>1</sup> has multiple distinct flaws. These range from the gross—Chinese government statistics are unreliable—to the subtle—none of the ways economic size is measured are especially reliable.

Obviously, the policies of the two countries matter, especially whether China ever returns to the pro-market reform path.<sup>2</sup> While evaluating the competing development models is contentious and complex, growth arithmetic is simple. Putting policy aside, “the year 2030” turns out not to be a bad call for when China will pass the US in economic size, but so is “never.”

## Purchasing Power Parity (Briefly)

Gross domestic product (GDP) is the standard measurement of national economic size, but it is illuminating to start with a variation, GDP adjusted for purchasing power parity (PPP). PPP-adjusted GDP is arguably the core US-China comparison because

it appears to show China has already passed the US in size. And the idea behind PPP itself is appealing; the equivalent of a dollar may buy more or less around the world depending on local prices, so economic comparisons should adjust for local purchasing power. But applying PPP to Chinese GDP (the US is the baseline, so American GDP is unchanged) is so fraught with problems that it should be viewed as nearly worthless. It is not generally viewed that way, but it should be.

PPP rests on assumptions, chiefly that the law of one price must hold for part of the purchases being compared.<sup>3</sup> The law of one price, in turn, rests on arbitrage—making money by buying, moving, and selling in markets with different prices. Arbitrage pushes these discrete prices together over time, to a single integrated price.

The main reason to set this aside in Sino-American economic comparison is simple: PPP does not actually hold for China or in important ways for the US. Within China, it fails between the coastal and interior regions.<sup>4</sup> China does not see arbitrage pushing prices close together even within the country, much

less internationally. A study of the US and Mexico after NAFTA went into effect still shows multiple important qualifiers to PPP between those two countries and an indeterminate result. PPP does not seem to hold for US-Canada exchange rates.<sup>5</sup> Even in economies as linked as Chinese provinces and as similar to the US as Canada, PPP fares poorly.

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As for why PPP might fail for China, consider investment. Even if PPP holds for the basket of consumption goods and services usually discussed, it does not necessarily hold for investment goods. This is a more important matter in China than in any other large economy because the PRC has an extraordinarily large share of GDP comprised of investment, in excess of 40 percent.<sup>6</sup> China also has effective controls on capital exit.<sup>7</sup> Capital not being able to move freely limits arbitrage opportunities and undermines the law of one price.

More practically, measurement of prices for PPP adjustments is poor at best. The most ambitious effort is the World Bank's International Comparison Program, whose last update was in 2011. The 2011 update contained sharp changes to many previous results,<sup>8</sup> which is reasonable given a dynamic world economy, but it establishes that PPP adjustments can rapidly become outdated.

The World Bank's World Development Indicators has 2017 PPP figures but only as extrapolations from the 2011 update. The implied PPP adjustment expands slightly from 2011 to 2017,<sup>9</sup> which flies in the face of a prime motive for US-China comparison: a fast-changing Chinese economy. The size of this error is indicated by the International Monetary Fund (IMF) projecting a 1 percent change in implied PPP conversion for China from 2011 to 2023, despite recording a 30 percent change from 1999 to 2011.<sup>10</sup> (World Bank figures are less precise but suggest a larger potential mistake.)

In addition to the perils of forecasting Chinese GDP, then, PPP forecasts could involve errors on the order of 30 percent. Moreover, verifying forecasts can be impossible even after the year forecasted, since the PPP adjustment could still be outdated. The evidentiary basis for forecasting PPP adjustments is extremely limited, and extrapolating the current adjustment is at odds with the available record and supposed ongoing transformation of China's economy. Quantitative forecasts of China's PPP-adjusted GDP out to 2023 and beyond are based on conditions that typically do not hold and measurements that typically are out of date.

Does PPP have any value in comparing the US and China? If PPP is assumed to hold, PPP-adjusted GDP is an annual snapshot, progressively less accurate as price measurements become dated. More likely, PPP fails.

However, it remains true that the buying power of consumers in China's interior provinces is understated due to lower prices on many internationally comparable goods. If China's announced GDP is accurate, understated interior buying power means it would be too low for purposes of comparison to the US. It is not understated by as much as the World Bank and IMF presently imply, and the extent of understatement should be shrinking. Nonetheless, the following estimates for simple GDP are modestly biased against China in this sense.

## GDP Projection

The following exercise is intended to illustrate various paths rather than conclusively establish any of them. For 2018, official Chinese GDP was just above RMB 90 trillion, or \$13.08 trillion, at the official Chinese exchange rate of 6.88 yuan to the dollar at the end of 2018. The first estimate of American 2018 GDP was \$20.89 trillion.

When evaluating trend, US GDP starts to look normal during 2010, but Chinese GDP was choppy by Beijing's standards into 2011. So the period 2012–18 will be used. The increments to nominal—meaning no need to also project domestic inflation—GDP are given in Table 1.

Using the simple average of nominal growth for the two countries and the end-2018 official Chinese

**Table 1. Increments to Nominal GDP, 2012–18**

	US	PRC
2012	3.6	11.2
2013	4.4	9.5
2014	4.4	9.2
2015	2.9	6.5
2016	3.4	7.9
2017	4.5	11.4
2018	5.3	9.2
<b>Simple Average</b>	<b>4.1</b>	<b>9.3</b>

Source: National Bureau of Statistics of China, “Annual Data,” <http://www.stats.gov.cn/english/statisticaldata/AnnualData/>; and Federal Reserve Bank of St. Louis, “Gross Domestic Product,” <https://fred.stlouisfed.org/series/GDP>.

exchange rate, China passes the US in GDP in 2028. *This is almost surely inaccurate in China’s favor.* A less important factor: The nominal exchange rate has stayed between six and seven yuan to the dollar for more than a decade. Six yuan to the dollar would see China passing the US in 2025, but the trend in China’s balance of payments away from large surpluses toward deficits<sup>11</sup> suggests downward pressure on the yuan instead. An exchange rate of 7.8 yuan to the dollar would see China passing the US in 2031. This is a standard range in which China will become number one in GDP.

More important than the exchange rate, though, is a crucial advantage the US has over China: a much longer track record of holding growth at near the 2012–18 average pace. American 2018 GDP growth looks unsustainable against both the recent trend and anticipated future borrowing. But simply ignoring the 2018 result barely changes the projected American path.

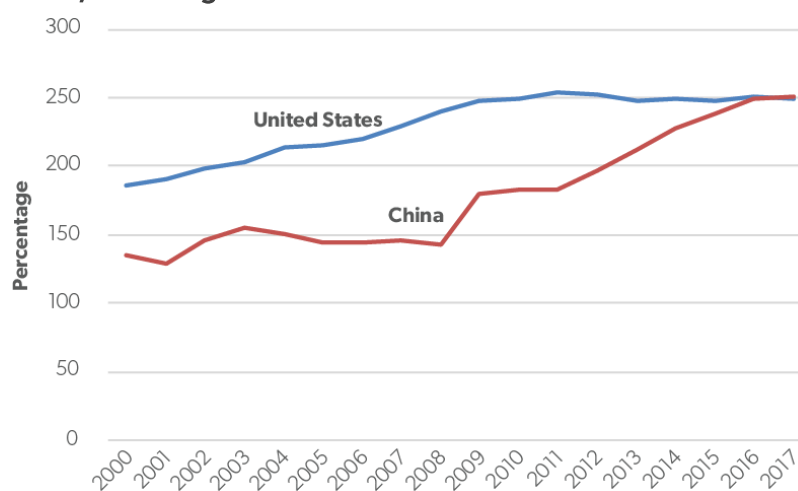
Chinese GDP growth is likely to slow much more substantially. With the country both aging and recently accumulating a great deal of (internally held) debt,<sup>12</sup> slowing is the consensus view. Rather than reprise unresolvable debates over how sharp the slowing will be, a gradual slowing path for China is set at 7.9 percent nominal growth. This is a reprise of the official result for 2016, the second-lowest since the financial crisis. It may be considered too slow for

2019–20, though perhaps not by much. It will almost surely be too fast for 2029–30. (See below.)

At 7.9 percent nominal growth and the end-2018 official exchange rate, China would pass the US in 2031. At six yuan to the dollar, this would occur at the end of 2027. At 7.8 yuan to the dollar, it would occur in 2035. *This is a far more reasonable projection than holding current growth, and it does not change the outcome much:* China will overtake the US in just a few extra years.

The sharp slowing path is 5.3 percent nominal growth, chosen arbitrarily to be the same as the recent US high in 2018. This is certainly too low as a projection in 2019; the question is when it will stop being too low. Regarding official data, Beijing will not report anything as low as 5.3 percent nominal GDP growth for years to come, barring an extraordinary event such as a repeat of the Lehman shock. But the true annualized pace was almost certainly already lower than that briefly in late 2015 and late 2018.<sup>13</sup>

It may get back to that low, then drop further, sooner than widely believed. From the end of 2000 to the end of 2017, America’s credit-to-GDP ratio increased by over 63 percentage points, declining from 2012. Over the same period, China’s credit-to-GDP ratio increased by 110 points, with no evident peak yet reached (Figure 1). Chinese leveraging has soared, making it more and more difficult for additional capital to support growth.

**Figure 1. Credit to Nonfinancial Sector from All Sectors at Market Value, Percentage of GDP**

Note: Adjusted for breaks.

Source: Bank for International Settlements, “Credit to the Non-Financial Sector,” March 5, 2019, <https://www.bis.org/statistics/totcredit.htm?m=6%7C380%7C669>.

The same is true for labor. The PRC's median age is about the same as the US now, but in 20 years it will be halfway between an older US and an even older Japan.<sup>14</sup> Labor is in transition from a huge spur to growth to a large drag. Related, China does not allow private ownership of rural land, leaving close to 600 million people without their most valuable asset. Their lack of wealth helps explain rural education levels so low that nominal growth of 5.3 percent is already seen by some as the most likely outcome over the next 20 years.<sup>15</sup>

At the end-2018 exchange rate and 5.3 percent nominal gains, the US is still 25 percent bigger than China in 2035. The twist is that the near-certainty of declining Chinese growth for the next generation means the sooner it slows down, the less likely the PRC ever catches the US. The basic arithmetic shows China does not pass the US in GDP until 2054 (Table 2). Further, yuan depreciation against the dollar is more plausible in this low-growth scenario, which would put off GDP parity almost another decade. This is all too far away to be considered even a highly uncertain forecast; it is an extrapolation over a time period over which no extrapolation will end up being accurate.

The US is also aging, if more slowly, and these extra years are likely to bring slower American growth as well. More important quantitatively, the US can at any time adopt outright growth-destroying policies as politically expedient. This process has already started to some extent with a poorly constructed tax cut from Republicans and could be intensified by large-scale new transfers from Democrats. In that instance, a PRC able to maintain only what appears to be low nominal growth could still catch the US in the 2030s.

The mistake in using PPP-adjusted GDP is revealed suddenly, when new conversion factors are calculated. With GDP itself, mistakes build up more slowly. At the time of writing, China's economy is slowing faster than some expected just a year earlier.<sup>16</sup>

That may be halted, but the 5.3 percent case points to how much near-term mistakes matter.

The certainty of China claiming the GDP crown over a reasonable forecast horizon rests on accurate official statistics and the very gradual slowdown the Chinese Communist Party insists on. Both are plainly unreliable, and, if both prove false, the extent of the error could reach a generation or more.

## GDP Weaknesses

It is common to refer to GDP as “the economy.” This is immediately a mistake, as GDP just measures annual economic activity. It is tiny on January 2, but the economy is not. GDP does not provide vital information. For instance, distribution of economic gains is obviously important, but the distribution of GDP is not a sensible indicator.

There are also China-specific problems. The obvious: China often manipulates its statistics.<sup>17</sup> Announced real GDP growth is plainly smoothed, using either scholarly analysis or a pair of eyes.<sup>18</sup> One recent estimate identifies major growth exaggerations in 2009–10, as to be expected given the Party's aversion to acknowledging instability.<sup>19</sup> The data manipulation is not going to end and thus will cloud US-China comparisons indefinitely. But much of the manipulation can be accomplished through the GDP deflator—the inflation adjustment to the calculation of nominal GDP—meaning the nominal GDP used here could be largely accurate.

A possibly bigger problem with Chinese GDP lies within GDP itself. The idea behind GDP supposedly representing the economy is that activity is highly correlated with prosperity—that measured transactions have lasting value. Otherwise, rising GDP is only an accounting result. Constructing airports that few use, buildings that are quickly torn down and replaced, and power and water plants that are unconnected to their grids, as examples,<sup>20</sup> adds to GDP

**Table 2. When China Passes the US in GDP**

	<b>9.3 Percent Nominal GDP Growth</b>	<b>7.9 Percent Nominal GDP Growth</b>	<b>5.3 Percent Nominal GDP Growth</b>
<b>6.88 Yuan/Dollar</b>	2028	2031	2054
<b>6.0 Yuan/Dollar</b>	2025	2027	2046
<b>7.9 Yuan/Dollar</b>	2031	2035	2062

Note: Assumes US growth average 2012–17 is maintained.  
Source: Author's calculations.



only briefly. “Bad GDP” in this sense is an investment with only a short-term return in terms of true growth.

Casual observation of China indicates widespread and long-term<sup>21</sup> oversupply of important products—wasted economic activity. A quantification of this: Official Chinese GDP and population imply 2018 GDP per capita of RMB 64,500 (close to \$9,400). Yet official “per capita disposable income of residents” was reported at RMB 28,228 (\$4,100 and change), 56 percent lower. This is a measure of “bad GDP.” The comparable US figures show a 23 percent gap.<sup>22</sup> Chinese GDP seems to represent something different and often less valuable than American GDP. This may help explain why it can be calculated so much more quickly.

## National Wealth

What is really meant by “the economy” is wealth. It does not reset at the beginning of a new year. Its distribution is meaningful. GDP per capita is an accounting entry; how people are faring is seen in their personal wealth. The resources a country can draw on for military activity, for instance, are only indirectly represented by the trend in annual economic activity. They are directly represented by accumulated stock of national wealth.

There is a serious problem with using wealth: It is poorly measured in most places, including the PRC. The Federal Reserve has a well-behaved and

well-defined series on American net wealth, standing at \$95.1 trillion at the end of 2017.<sup>23</sup> There is a commendable Chinese effort to create a counterpart to some of the Fed’s accounting, known as the China National Balance Sheet (CNBS).<sup>24</sup> For the purposes of determining wealth, however, it has multiple flaws.

At the conceptual level, a balance sheet is not quite the same thing as calculating net wealth, as seen by comparing Fed and CNBS methodologies. As a practical matter, the largest assets in the CNBS are residential property and corporate fixed assets. The value of Chinese residential property is distorted by state ownership of all land on which new residential developments are created, as well as heavy intervention into property finance through state bank lending and regulatory management.<sup>25</sup> These problems exist in the US but are considerably more extensive in China, making asset valuation much less precise.

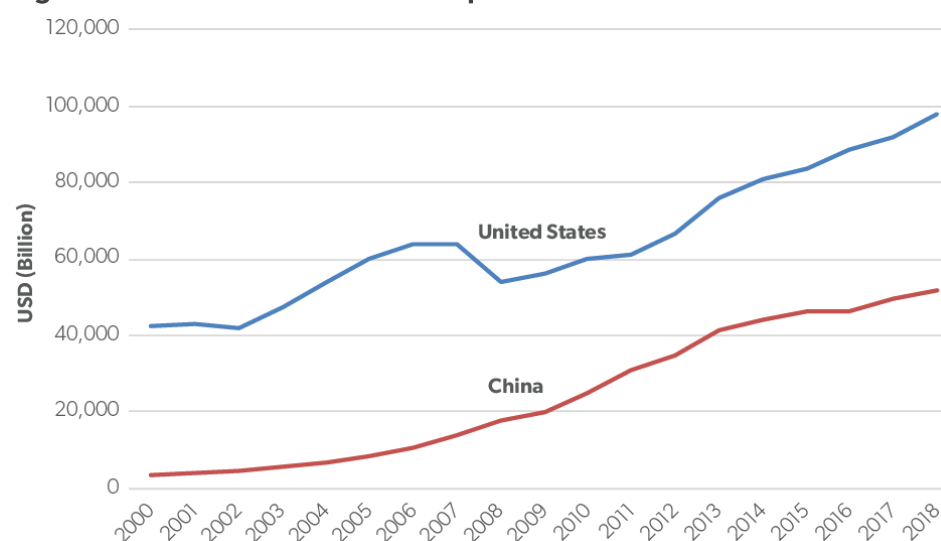
The corporate side is worse. Official fixed investment statistics are so misleading as to be unusable.<sup>26</sup> This is not surprising; the corporate reporting on which fixed investment is based is highly suspect, sometimes due to government encouragement of falsification.<sup>27</sup> The fixed asset entry in the CNBS is based on nearly useless information. With the two largest entries so flawed, an alternative is necessary.

Credit Suisse has undertaken a sustained multinational effort to measure household net worth. (This is the most important component of national wealth but not the only one.) The effort also reflects the perils

of assessing China. The 2017 version of Credit Suisse’s report put the net worth of Chinese households at \$29 trillion in the middle of that year, consistent with the previous 16 years in the series. The 2018 report revised that figure to \$49.6 trillion.<sup>28</sup> It may be that the revised figure is more accurate, but the number is obviously not reliable.

Wealth projections are therefore ideal as objectives but only suggestive

**Figure 2. Net Household Wealth Comparison**



Source: Credit Suisse Research Institute, *Global Wealth Databook 2018*, October 2018, <https://www.credit-suisse.com/corporate/en/research/research-institute/publications.html>.

for the moment. Nonetheless, what they suggest is notable. After revising Chinese wealth sharply higher, Credit Suisse shows almost exactly a 50 percent increase from the end of 2012 to the middle of 2018. For the US, the gain is close, at 47 percent (Figure 2). Given the larger US base, the US has been pulling away in absolute terms for the past six years. At the end of 2012, the American wealth advantage was \$32 trillion. In the middle of 2018, it was \$46 trillion.

The PRC is not going to catch up like that. The pace of American wealth growth will likely slow, with stock markets, especially, seeing gains over this period that cannot be sustained for much longer. As with GDP, however, China's wealth growth has already slowed and is likely to continue to, barring pro-market reform. China should be able to halt the expansion in the wealth gap in America's favor, but any narrowing will not last long due to aging and debt. Without a return to reform, the ratio of American to Chinese household wealth will fall, but the absolute American advantage should remain above \$30 trillion for the indefinite future.

## About the Author

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## Notes

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## Summary

Popular claims that China's economy is already the world's largest may be exaggerated by as much as 30 percent. In any case, they are dubious on the more technical grounds that PPP does not actually seem to work. Wealth is the right concept for national economic comparisons, but measuring Chinese wealth is also a fraught endeavor. The most intriguing aspect of wealth comparisons is the PRC may not be catching up, at all.

There are also reasons to question US-China GDP comparisons, in part because the PRC publishes sanitized data but also because some Chinese transactions may be close to worthless. If taken at face value, US-China GDP comparisons are highly sensitive to Chinese growth doing what Beijing will say it will do—slow gradually. More rapid slowing is likely in light of aging and debt and would push off calculated Chinese parity toward mid-century, long past the point when such predictions are credible.

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