

AN INDEPENDENT LOOK AT CHINA'S
ECONOMIC SIZE

BY DANIEL H. ROSEN AND BEIBEI BAO | No. 1 | SEPTEMBER 11, 2015

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rom June 2015, waves of investor panic have deflated China's equity market bubble, revealing limits in Beijing's ability to impose politically correct values on stocks. Despite gathering uncertainty, in August the People's Bank of China took steps toward exchange rate regime liberalization, and the resulting volatility in capital flows exposed deteriorating confidence—Chinese and global—in the macroeconomic fundamentals underpinning the country's growth outlook. These corrections in estimations of both China's policy management and its fundamental growth potential have immediate spillover effects on markets and expectations worldwide. Leaders and business decision makers abroad must now make judgments about the repercussions.

To do so, they need to make sense of how much China's present market adjustments—whether inadvertent or by design—will reduce near-term gross domestic product (GDP) growth, and also a larger question: how believable is the underlying *base* of economic activity? Never mind whether it's growing, is China really the \$10 trillion dollar share of global economic output it claims to be? Recent work we have completed, including the new CSIS study, shed light on these questions.

The size of China's economy is fundamental to thinking about its growth prospects, but given the technical difficulties of examining it and the obscurity of China's data system, it is less frequently studied than growth dynamics. In January 2015 Beijing declared the economy had reached nearly 64 trillion renminbi (RMB) in 2014, joining the 14-digit club—more than \$10 trillion in headline GDP—only the second nation, besides the United States, to do so. Despite a year of painful restructuring, China managed to add \$870 billion to its annual output from the previous year's level, an increase of more than half the entire Australian GDP. While subsequent

EDITOR'S NOTE

This commentary is adapted from the executive summary of a forthcoming study to be published by the Center for Strategic and International Studies (CSIS), authored by Dan Rosen and Beibei Bao of Rhodium Group. The Freeman Chair in China Studies at CSIS will host a 9:00am roll-out event on September 15 for the study, *Broken Abacus? A More Accurate Gauge of China's Economy*, in Washington, D.C.

discussion turned to whether and how China *could* continue to deliver such growth, an important consideration was largely left aside: the foundations upon which Chinese and U.S. GDP are constructed are not quite comparable.

One of the primary uses of GDP, an artificial metric invented to measure economic performance, is to gauge development of an economy and to measure its capabilities relative to others. Cross-period and cross-country comparisons, under the assumption of methodological comparability, provide support for policy and business decision making, and offer a benchmark for grading prior policy decisions. However the standards of GDP measurement evolve over time, and the present Chinese numbers do not fully reflect updates to the system of GDP accounting introduced in 2009 by the United Nations and four other international organizations. The United States and other advanced economies have since adopted the 2009 system, rendering current comparisons with China's GDP incongruous.

Just days after President Xi Jinping rolled out the reform blueprint for his term at the monumental Third Plenum in November 2013, China committed to upgrading its accounts, with a working deadline of late 2014 or early 2015. Enhancing the data regime is a cornerstone of Beijing's reform agenda, as leaders require increasingly accurate economic data to govern effectively. But to date, this upgrading has not been completed for reasons Beijing has not made clear. Such a fundamental move, once realized, will not only increase the accuracy of accounting in areas already covered—such as real estate activities—but will also enable policymakers to quantify new forms of economic value added, which are not captured in the 1993 vintage GDP framework China still retains.

Without this methodological advance, Beijing is measuring a 2015 economy using a 20-year-old framework. China bases its current system of GDP accounting, known as "2002 Chinese SNA," on the 1993 System of National Accounts (SNA), which has narrower coverage of activities including research and development, real estate, and finance. The fact that new-generation methods have lifted GDP levels in countries that have undertaken the transition testifies to that. The International Monetary Fund (IMF) reports that systemic upgrading raised GDP by 0.5 to 3.5 percent where implemented. In the case of the United States, 2012 GDP was revised up to an even higher 3.6 percent due to a broader inclusion of intangible assets and investment.

As China draws closer to the United States as an economic competitor, the importance of a fair base for comparison also mounts. Popular attention naturally gravitates to the relative heft of these two global economic giants, and perceptions of the closing gap influence policy debate over how to deliver growth—not only in the United States and China, but in many other developing economies contemplating the best strategy for securing prosperity.

With these matters in mind, we independently re-estimated China's economy in terms of nominal GDP. To produce a result that could be compared with official Chinese figures, we relied on official data when made sense to do so, while documenting the merits and pitfalls involved. We described and followed China's stated methods for calculating national accounts wherever possible and employed alternative data where necessary. Our most important findings are quantitative because few studies have attempted such an independent reappraisal of China's nominal output. A summary of our findings is presented in Table 1, and the figures below describe the highlights. Die-hard national accounting specialists and macroeconomists will find a multitude of quantitative and qualitative findings in the full study, but the seven findings listed below are most noteworthy for experts and general China-interested readers alike.

TABLE 1. A RECONSTRUCTION OF CHINA'S 2008 GDP

Unit: RMB trillion

	Official	Recalculated	Recl./Official %
GDP*	31.40	35.51 36.53	13.1% 16.3%
Primary Sector	3.37	3.26	-3.2%
Secondary Sector	14.90	16.14	8.3%
Industry	13.03	14.13	8.5%
Construction	1.87	2.01	7.3%
Tertiary Sector	13.13	16.06	22.2%
Transportation, Storage, and Postal Services	1.64	1.83	11.9%
Info Trans, Computer Services and Software	0.79	0.86	9.7%
Wholesale and Retail Trade	2.62	3.04	16.1%
Accommodation and Catering Services	0.66	0.70	5.7%
Finance	1.49	1.53	2.8%
Real Estate	1.47	3.43	132.8%
Education	0.89	0.87	-2.1%
Public Administration and Social Organizations	1.38	1.42	2.7%
Other Six Service subsectors	2.20	2.38	7.9%
Research and Development	n/a	0.04 1.07	n/a

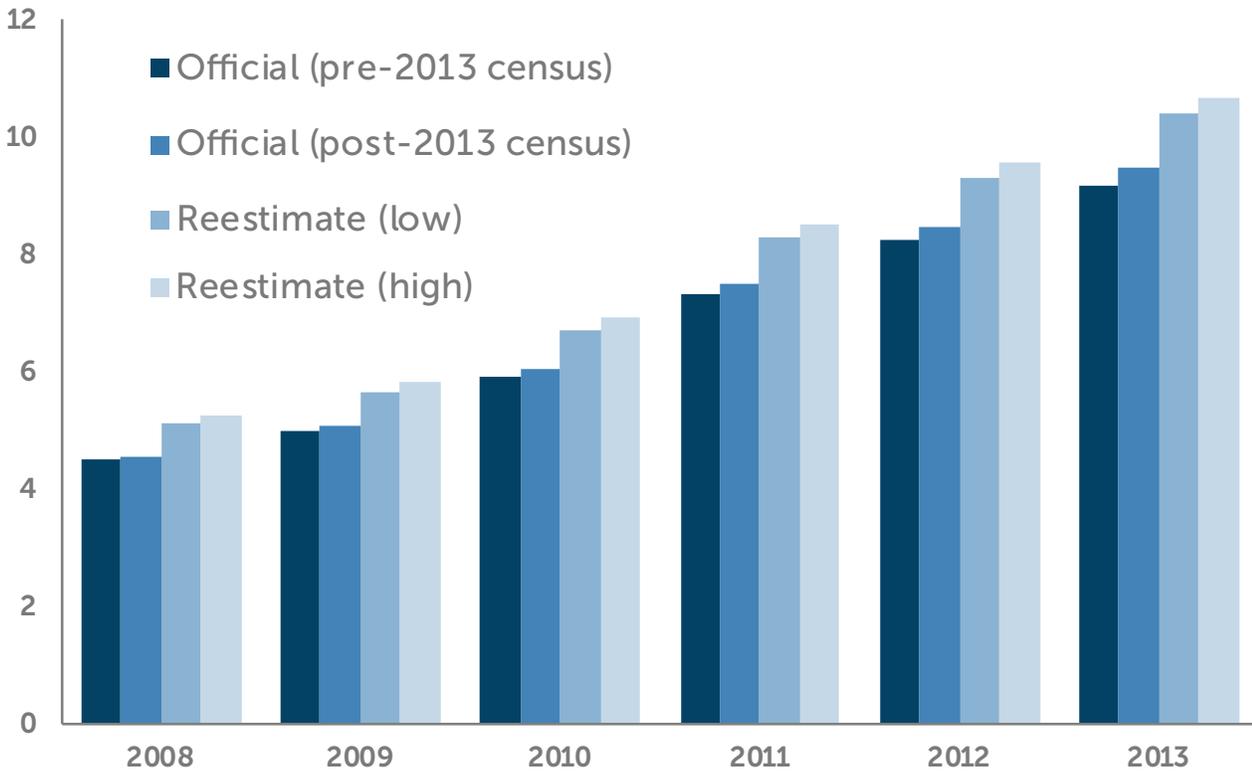
* The two values are derived from two scenarios of R&D inclusion's impact on GDP. The official data are not subject to 2013 census revisions.

Sources: NBS, authors' calculations

China is bigger, not smaller: To gauge current GDP accurately, one must start by rebuilding estimates from a base year, for which we chose 2008 because it has the best available data needed for this exercise. Our reassessment suggests that China's 2008 GDP was most likely 13.1 to 16.3 percent higher than official statistics indicated at the time. Beijing's reappraisal of 2008 GDP (released in Spring 2015) adjusted up the official number by less than 1 percent, leaving the bulk of the activity we identified uncounted. For general purposes we believe it is reasonable to extrapolate those results to the current period as well, which leads us to the conclusion that China's 2013 GDP is more accurately stated at about \$10.5 trillion rather than the official \$9.5 trillion—a pattern likely to continue until the National Bureau of Statistics (NBS) makes additional revisions. These results are illustrated in Figure 1.

FIGURE 1. OFFICIAL VERSUS REVISED GDP COMPARISON

Unit: USD trillion

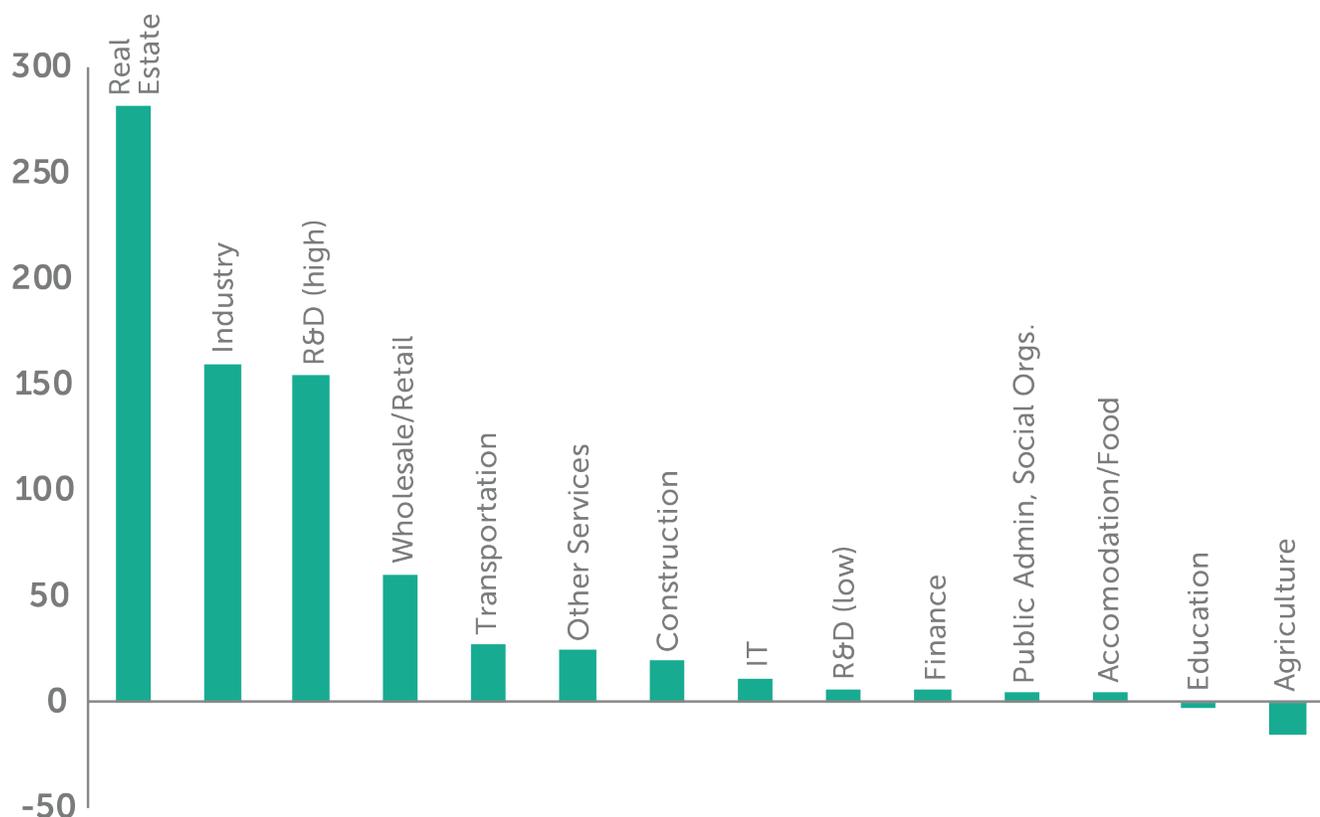


Sources: NBS, authors' calculations

The service sector is most problematic: We can rank the areas of the economy where the greatest adjustments are required, as illustrated in Figure 2. At the broadest sector level, the hard to count services cluster is unsurprisingly in greatest need of upward revision—22.2 percent in our estimate. The secondary sector, consisting of industry and construction, needs a smaller but important 8.3 percent upward revision. The primary sector, meanwhile, still requires a modest discounting by our reckoning. Last, we examined elements not yet covered in China's official GDP, which should be included once practices are modernized, particularly the capitalization of research and development (R&D) investment. (Due to data limitations, R&D value-added cannot be clearly divided between industrial and service activities, and hence we separate them from the other sectors, as shown in Table 1). China does not publish value-added data for R&D, but according to our calculations, officials are underestimating R&D value-added by \$6.5 to \$154 billion a year, though data do not permit us to specify a value within that wide range (Table 2).

FIGURE 2. A BREAKDOWN OF MARGINAL REVISIONS TO 2008 OFFICIAL GDP

Unit: USD billion



Sources: NBS, authors' calculations

TABLE 2. SECTORAL ADJUSTMENTS' IMPACT ON 2008 HEADLINE GDP

Unit: RMB trillion

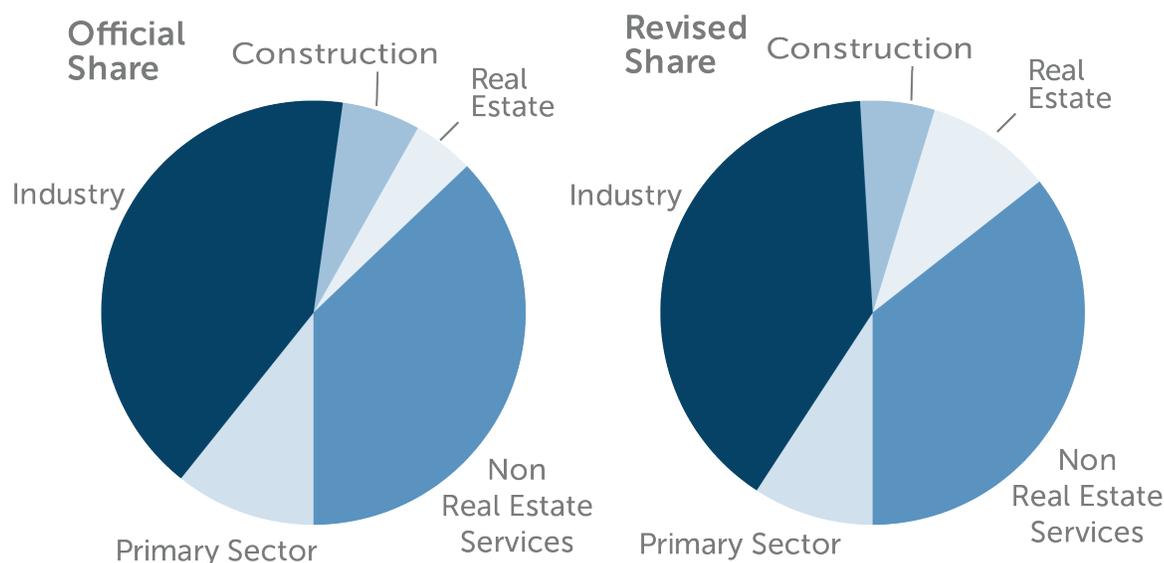
	Official Value-Added	Recalculated Value-Added	Revisions' Impact on Official Headline GDP
GDP *	31.40	35.51 36.53	13.1% 16.3%
Primary Sector	3.37	3.26	-0.3%
Secondary Sector	14.90	16.14	4.0%
Tertiary Sector	13.13	16.06	9.3%
Research and Development	n/a	1.07	3.4%

* The two values are derived from two scenarios of R&D inclusion's impact on GDP. The official data are not subject to 2013 census revisions.

Sources: NBS, authors' calculations

Real estate is even more important than currently assumed: The distribution of specific industrial underestimates is striking. The largest revision, in real estate, is responsible for 38 to 48 percent of our total adjustment, suggesting that China’s GDP growth has been even more dependent on a property boom than previously understood (Figure 3). Therefore, that output pattern likely disproportionately benefits a minority of wealthier Chinese who are already widening the income and wealth gap

FIGURE 3: REAL ESTATE SHARE IN CHINESE ECONOMY IS MORE PROMINENT THAN THOUGHT*



	Official GDP	RHG Revisions
Primary Sector	10.7%	9.2%
Industry	41.5%	39.9%
Construction	6.0%	5.7%
Real Estate	4.7%	9.7%
Non-Real Estate Services	37.1%	35.6%
Total	100.0%	100.0% *R&D level no impact.

(Data see Fig 3 data tab)

* This sectoral breakdown does not include impact of R&D capitalization, whose value is calculated using a different methodology from the rest. See details in Chapter 3.

Sources: NBS, authors' calculations.

Structural adjustment started earlier: While problematic from a property sector and income distribution perspective, these results do come with a silver lining: the promising service sector overtook the industrial sector earlier than believed—in 2009, not 2012 as official data now suggest. This is a necessary indicator of a sustainable future, although not a sufficient one as long as it is overly dependent on real estate-related value. This earlier internal passing point was a key fact missing from the 2008 to 2013 policy debates. China was more like similarly developed countries than previously thought. It was, in this sense, more “normal.” It also suggests that the end of the line for the old growth model arrived in the middle of the Hu Jintao era, rather than the beginning of the Xi Jinping era.

A higher GDP denominator could change policy-relevant ratios: Our calculations suggest that China's output value, rather than *input* costs, has been underestimated. This has interesting implications for the ratios that are used to gauge performance. With a higher GDP denominator and a steady input numerator, the debt to GDP picture (or output per unit of capital invested) is slightly less dire. Gross output per worker is slightly higher, indicating a marginally better labor productivity. The energy intensity of GDP is slightly lower than previously observed. It is important, however, not to compare pre-revision intensities with post-revision estimates and mistake an artificially steep change for real progress. For instance, Beijing's carbon reduction goals, benchmarked against 2005 intensities, should be evaluated against a constant series, not a "broken" data set.

China could be the world's largest national economy sooner than previously thought: On the international policy side, the first and foremost quantitative question is whether China's economy is a Potemkin village of statistical artifice. We dismiss this line; China is as large, or likely larger, than officially stated. The most charged policy context in which this query arises is the discussion of whether and when China's nominal GDP could achieve the top spot globally. Our study suggests that the "global passing point" could arrive two to three years earlier than currently predicted because of the more advanced level of Chinese value-added. However, the exact year depends on relative growth rates, inflation, and exchange rate outcomes in both China and abroad—especially in the United States. A related insight is that it will be harder to wring higher growth out of the structure of today's more advanced Chinese economy in the years ahead.

Knowledge-intensive industries are increasingly important: A final headline observation is that high-skill, knowledge-intensive, and inherently international subsectors will account for a large and influential share of China's reported GDP growth in the coming years. As noted earlier, value-added from R&D activity plays a key role in our upward revisions, especially in light of the latest international GDP practices. China's own restatements—announced in December 2014 and also in early 2015, before the publication of this study—emphasized financial services value-added growth which we did not even count, for lack of access to key information at the time. Both these market segments rely on professionals with a high degree of mobility—the choice to move to the most attractive opportunities internationally—and depend on free flows of information and ideas, within China and across the nation's borders. As discussed in Chapter 1 of the study, the rise of GDP as a standard yardstick for national economic performance was driven in part by popular demand for illumination as to the relative performance of different economic systems, and these advanced activities are the cutting edge of that contest today.

In light of the findings above, we are able to examine the second question asked at the beginning of this commentary in a new light—to what extent will the current disruptions in China's economy affect its near-term growth? One thing is for sure: given finance's outsize contribution to Chinese GDP in the first half of 2015, the stock market rout since mid-June will weigh on growth momentum in the second half of the year. From 2012 to 2014, financial intermediation contributed an average of 0.6 percentage points to headline output growth, largely from bank activity. In the first two quarters of 2015 that contribution had *doubled*. Limited trading will now lead to a reversion to historical averages—maybe not all the way back to previous levels, but a significant reduction is in the cards. This knocks a half point off growth from first order effects alone (meaning 6.5 percent GDP growth rather than 7 percent, all things being equal).

As useful as these tallies are in terms of anticipating the results Beijing is likely to claim, they do not inform us what is going on beyond official headline GDP. After all, GDP, like any other estimation of activity, is a man-made, artificial construct that is increasingly deemed inadequate—particularly in China's case—in mirroring the objective reality as the modern economy advances. Moreover, value creation is becoming less tangible and less quantifiable. From what we now know about elements that are left out of China's current accounting framework, the market correction will have at least three implications for the near-term growth outlook beyond the official numbers.

First, the “New Normal” Beijing continues to reference signifies growth in segments that is currently undercounted in China’s SNA. Meeting China’s future potential will not be achieved without a period of painful restructuring and necessary slowdown. Beijing must stay on the course of economic reform instead of resorting to stimulus whenever it feels there is a political need to stabilize public sentiment. A slowdown at least as wrenching as the current scare is a *necessary* precursor to restored momentum from high-productivity sunrise segments.

Second, a methodological upgrade, whenever it *does* materialize, will tend to prop up headline growth a bit, as it has for other economies. However, there is no reason to presume that is the primary goal of a revision. Once China completes a transition to the new SNA, the inclusion of R&D, other intangible items, and small businesses will raise headline GDP by a minimal amount at the very least. Better captured growth from previously undercounted activities such as R&D, in turn, may prompt local officials to step up investment in those areas, and help shape a virtuous cycle in nurturing indigenous innovation.

Third, the market rout spells out a more urgent need for reform. A base nominal GDP figure 10 to 15 percent above current official numbers, plus growth holding up in the 5 to 7 percent range through 2020, would mean *tens of trillions* in additional RMB economic output through the decade. But this potential is in large part contingent on accelerated reforms, without which the nation’s potential cannot be achieved.

In sum, by dragging its feet on updating its system of national accounts, China has effectively set the scene to present the *appearance* of somewhat faster growth in new activities which in fact have already started to blossom. That growth—and further growth potential from next-generation activities—is real and not some trumped-up contrivance. And yet, the inclination to smooth headline growth reports to avoid pronounced revisions, which arguably helped to shore up confidence in China’s stability in the past, is increasingly misguided. Independent researchers with access only to public materials—like us—are now able to second-guess the completeness of reported Chinese output to a greater extent. Therefore, holding back revisions will only increase qualms, not allay them. Private Chinese observers, as well as public and private non-Chinese observers, have a legitimate and quickly growing right to accurately gauge the size, structure, and performance of China’s economy because it directly impacts their core interests. Over the past decade, analysis on China’s nominal GDP size has taken a back seat to discussion of annual growth rates, which is also immensely important; but in the years ahead the absolute size of the Chinese economy, not just the year-on-year change in the aggregate, will be of increasing interest and discussion. ●

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