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China's Economic Growth Statistics: Trustworthy in the Long Run, Less So in the Short Run

Carsten Holz, Visiting Scholar (2003–2004), APARC

Over the past twenty-five years, according to the official data, China's economy grew at an average annual real growth rate of 9.37 percent. By 2003, China's gross domestic product (GDP) was 9.38 times larger in real terms than at the beginning of the reform period in 1978. But in recent years, China's official GDP values and real GDP growth rates have been repeatedly questioned.

Much of the criticism focuses on the GDP growth rates of the late 1990s.[1] The real growth rates supposedly conflict with the growth in related physical quantities such as energy consumption, product quantities produced, or freight transportation. Yet upon closer inspection, much of the perceived discrepancy is due to a misunderstanding of the coverage of individual statistics. That is, statistics on energy consumption do not cover all energy consumption in China (and similarly for product quantities produced and freight transportation).[2] The evidence suggests that the coverage is limited to the directly reporting enterprises, i.e., those enterprises that exceed a specific size criterion and therefore must report directly and regularly, usually monthly, to the statistical authority. Any doublecheck is further complicated by the fact that the coverage of the directly reporting enterprises changed in 1998.

Doubt has also been cast on China's long-run economic growth rates. A 1998 study by Angus Maddison reduced China's average annual growth rate between 1978 and 1995 from 9.88 percent—the official number—to 7.49 percent.[3] Much of the difference arises from his assumption of zero labor productivity growth in certain service sectors and from his revisions to industry growth rates. The assumption of zero labor productivity growth in services such as banking will seem dubious to anyone who exchanged money in a Chinese bank in the mid-1980s and then did so again ten years later. Data from other countries also fail to support Maddison's assumption. The revisions to industry growth rates are based on product quantities produced; these, however, do not cover the whole economy. The published data do not include new products (such as cellphones, video cameras, or DVD players), where growth rates are obviously highest, nor do they account for the fact that a car produced in 1978 is not comparable to a car produced in 1995. That is, quality improvements are not factored in.

If there is no compelling evidence that official Chinese GDP growth rates of the late 1990s were falsified, and no compelling evidence that long-run growth rates are exaggerated, does this, then, mean that official Chinese GDP growth rates are accurate? Not necessarily. Chinese official GDP data and growth rates come with a large margin of error.

First, it is not unusual for the National Bureau of Statistics (NBS) to revise nominal GDP values up or downward by up to approximately one percentage point within one year after their first publication. As shown in the table below, in some years the first published real growth rates were also later revised (with a 1995 benchmark revision affecting all earlier growth rates). If the original, implicit deflator was correct, which is likely, revisions to nominal GDP values by necessity imply corresponding revisions to real growth rates in *all years*; a further column in the table has the data for this case.

Second, GDP can be calculated via three different approaches: the production approach (with the help of income data for some sectors) from which the NBS derives the official real growth rates; the income approach; and the expenditure approach. All three should yield identical GDP values. Thomas Rawski reconstructed China's 1997 and 1998 GDP based on the income approach and found a difference of just below one percentage point between his derived and the official 1998 real growth rate. Expenditure approach real growth rates can be pieced

together from a set of real growth rates available for the key components of expenditure approach GDP for the years 1978–95, and from nominal values combined with price indices for the years since 1991 (see table). The resulting real growth rates differ from the official ones every year, but not systematically. The table finally reports summary statistics on the annual variation in growth rate estimates.

Third, by following NBS explanations, it is possible to reconstruct the largest component of expenditure approach, GDP household consumption—which accounts for approximately half of GDP—from the underlying household survey and retail sales data. It turns out that the NBS' published expenditure approach GDP data were not derived from the underlying data in the way the NBS claims they were. Further, the relationship between consumption and the underlying data varies from year to year, i.e., expenditure approach GDP data are not compiled in consistent fashion over time. Production approach GDP—and therefore the official real growth rates—may be beset by similar problems.

Conducting a sector-by-sector analysis of the quality of value-added data, categorizing these data according to their quality, and attributing a subjective margin of error to each category (which takes into consideration the size of past, official retrospective revisions), suggests a 15 percent margin of error in GDP. Before concluding that Chinese official growth rates could potentially be vastly off, however, one must consider that if these errors are random, they may cancel out in the aggregate. Further, if errors were not random but perfectly systematic over time, growth rates could still be very accurate. But any aggregate bias is unlikely to be perfectly systematic over time: the NBS appears continuously to revise its GDP calculations (presumably in order to improve the quality of its GDP data), without documenting these changes, and with no guarantee that the changes have been properly considered in the published real growth rates or in benchmark revisions to earlier GDP values.

Consequently, Chinese official real growth rates should be treated with caution. The long-run growth rates are likely to be quite accurate. The annual growth rates could very well be anywhere within a 1.5 percentage point band of the official growth rate (a subjectively determined one standard deviation band) or even within a two to three percentage point band (two standard deviations).

Notes

[1] A number of Chinese and overseas authors have questioned the accuracy Chinese official GDP and real GDP growth rates. One of the most prominent authors is Thomas G. Rawski at the University of Pittsburgh. For his publications see *http://www.pitt.edu/~tgrawski/*.

[2] I have examined the quality of Chinese statistics and the criticism of Chinese statistics in a series of publications; the references are on my home page at *http://ihome.ust.hk/~socholz*.

[3] See the OECD study, "Chinese Economic Performance in the Long Run," by Angus Maddison, emeritus professor in economics at the University of Groningen. His website contains a link to a full copy of the cited publication (*http://www.eco.rug.nl/~Maddison/*).

China's Real GDP Growth Rates

	Production approach			Expenditure approach			Summary statistics		
	Official growth rates		Alternative	Aggregated component growth					
	first published	most recently published	latest nominal GDP, original implicit deflator	using decade weights	using previous year weights (two data sources)		Min. value	Max. value	Absolute range
1978		11.7		14.7	13.7		11.7	14.7	3.0
1979	7.4	7.6	7.4	8.5	8.8		7.4	8.8	1.4
1980	7.5	7.8	7.4	7.3	7.3		7.3	7.8	0.5
1981	4.6	5.2	5.6	4.6	4.6		4.6	5.6	1.0
1982	8.4	9.1	8.7	9.1	8.6		8.4	9.1	0.7
1983	10.1	10.9	10.7	9.8	9.9		9.8	10.9	1.1
1984	14.4	15.2	15.2	16.2	16.1		14.4	16.2	1.8
1985	13.5	13.5	15.0	20.0	19.0		13.5	20.0	6.5
1986	8.4	8.8	8.4	7.6	7.2		7.2	8.8	1.6
1987	10.4	11.6	10.7	7.2	6.8		6.8	11.6	4.8
1988	10.2	11.3	11.5	9.6	9.5		9.5	11.5	2.0
1989	3.5	4.1	3.9	1.7	1.3		1.3	4.1	2.8
1990	5.3	3.8	4.1	4.2	3.7		3.7	5.3	1.6
1991	7.8	9.2	12.0	10.4	10.4	10.1	7.8	12.0	4.2
1992	13.2	14.2	17.2	12.7	13.8	10.9	10.9	17.2	6.3
1993	13.4	13.5	14.5	14.9	15.2	10.7	10.7	15.2	4.5
1994	11.8	12.6	15.8	10.0	11.3	14.0	10.0	15.8	5.8
1995	10.5	10.5	10.6	12.3	11.8	11.0	10.5	12.3	1.8
1996	9.6	9.6	8.5			9.8	8.5	9.8	1.3
1997	8.8	8.8	8.3			7.3	7.3	8.8	1.5
1998	7.8	7.8	6.4			6.1	6.1	7.8	1.7
1999	7.1	7.1	7.3			5.5	5.5	7.3	1.8
2000	8.0	8.0	8.1			7.1	7.1	8.1	1.0
2001	7.3	7.5	9.0			9.7	7.3	9.7	2.4
2002	8.0	8.3	8.7			9.5	8.0	9.5	1.5
2003	9.1	9.1	9.1			10.9	9.1	10.9	1.8

Sources: Official growth rates, *Statistical Yearbook*. All other growth rates are based on own calculations using data from the *Statistical Yearbook* and other sources.

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