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The quality of China's GDP statistics☆

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ABSTRACT

Since the 1998 "wind of falsification and embellishment," Chinese official statistics on gross domestic product (GDP) have repeatedly come under scrutiny. This paper evaluates the quality of China's GDP statistics in four stages. First, it reviews past and ongoing suspicions of the quality of GDP data and examines the evidence. Second, it documents the institutional framework for data compilation and concludes on the implications for data quality. Third, it asks how the Chinese National Bureau of Statistics could possibly go about credibly falsifying GDP data without being found out. Fourth, it examines if the first- and second-digit distributions of official GDP data conform to established data regularities (Benford's Law). The findings are that the supposed evidence for GDP data falsification is not compelling, that the National Bureau of Statistics has much institutional scope for falsifying GDP data, and that certain manipulations of nominal and real data would be virtually undetectable. Official GDP data, however, exhibit few statistical anomalies (conform to Benford's Law) and the National Bureau of Statistics thus either makes no significant use of its scope to falsify data, or is aware of statistical data regularities when it falsifies data.

1. Introduction

Chinese official statistics have a bad name. It doesn't seem to matter which Chinese statistics one looks at. There is the discrepancy between the official Beijing air quality measurements and the air quality measurements conducted by the U.S. Embassy in Beijing atop its embassy building: one day in October 2011, the Chinese official reading was "slightly polluted" while the U.S. reading was "crazy bad" (later revised to "beyond index").[1] China's premier Li Kejiang in 2007 called China's gross domestic product (GDP) figures "'man-made' and therefore unreliable," with all data other than electricity consumption, volume of rail cargo, and amount of loans disbursed being "for reference only."[2] Energy data came under suspicion in 2012 with a report that "local and provincial government officials have forced [power] plant managers not to report to Beijing the full extent of the slowdown."[3]

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[1] See *Los Angeles Times*, 29 October 2011. The U.S. Embassy's readings are fed into twitter on an hourly basis (justified by diplomatic rules which require that information regarding health and security risks are being made available). The Chinese Foreign Ministry complained in July 2009 that "because the U.S. data conflicted with China's, they were causing 'confusion' and undesirable 'social consequences.'".

[2] *New York Times* (22 June 2012) and the *Wall Street Journal* (6 December 2010). The source is an American diplomatic cable released by WikiLeaks.

[3] *New York Times*, 22 June 2012.

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What often goes unnoticed are the details: the U.S. Embassy tracks particles of smaller size than Beijing's official measurements do. The U.S. readings thus do not prove the Chinese data wrong. (The U.S. data might, however, be more meaningful for health matters than the Chinese data.) Premier Li Kejiang's statement on the reliability of Chinese statistics goes back to his time as Party Secretary of Liaoning province, and his evaluation is explicitly focused on Liaoning data. There is abundant evidence of data falsification at the *local* level, typically attributed to cadres' evaluation being linked to local economic performance.[4] Falsification of energy data in 2012 is questioned by a Western expert on Chinese energy data as hardly feasible at the five biggest electricity generation companies that together produce half of China's electricity, and while potentially possible at smaller producers such data would eventually have to be reconciled with all fuel, electricity, and financial accounts.

If anything, Li Kejiang's statement reveals the difficulty that China's National Bureau of Statistics (NBS) faces in publishing meaningful data. GDP data are by definition 'man-made' — the very fact that Li Kejiang criticizes. Value-added (VA) isn't apples growing on trees, to be counted and added up. For example, across the tertiary sector, the NBS in compiling national GDP has to rely on income approach data, and for many of these data, the NBS has to rely on sample surveys and imputations. Li Kejiang's preference for energy, rail cargo, and loan data presents a fallback to the planned economy era with output measured in physical units (such as tons and cubic feet) rather than in value terms, and with a focus on "material production."

The suspicions of Chinese data are a relatively recent phenomenon, starting in the late 1990s. To be sure, there were the data excesses of the "Great Leap Forward,"[5] and there have always been suspicions of some local "water content" and potentially (small) adjustments to national data,[6] but up through the 1980s researchers tended to issue a clean bill of health for Chinese statistics. Thus, in 1962, Li wrote cautiously about improvements following the statistical debacle during the "Great Leap Forward." Perkins concluded in 1966 that falsification of disaggregated data was highly improbable; in the case of aggregated data, falsification might have remained unnoticed in the short run, but not in the long run, and such falsification in the end would not have been in the interest of the Chinese leadership. In 1976, Rawski argued that "most foreign specialists now agree that statistical information published in Chinese sources provides a generally accurate and reliable foundation on which to base further investigations" (p. 440). In 1986, Chow wrote that "by and large Chinese statistics officials are honest" (p. 193).

This paper evaluates the quality of China's GDP statistics in four stages. First, it reviews past and ongoing suspicions of the quality of Chinese GDP data and examines the evidence. Second, it documents the institutional framework of data compilation in China and concludes on the implications for data quality. Third, it asks how the NBS could possibly go about credibly falsifying China's GDP data without running the danger of being detected, and evaluates the practical feasibility and likelihood of such data falsification. Fourth, it examines if the first- and second-digit distributions of official Chinese data conform to established data regularities (Benford's Law) or if they exhibit statistical anomalies.

2. Questions about Chinese data quality, and technical limitations

The problems in compiling accurate data in transition economies have been widely documented for Eastern Europe and Russia, but much less so for China.[7] Since the beginning of the economic reforms in 1978, economic transition, economic growth, and structural change have created severe challenges for the compilation of accurate statistics in China. These challenges include:

- Rapid growth in production units outside the traditional reporting system.
- Adoption of novel statistical concepts and variables with a transition from physical measures to value-based national income accounting that covers the complete economy.
- Increasing data falsification at local levels (supposedly because cadres' evaluation became linked to economic performance).
- Potentially declining interest of reporting units and relevant government departments to report to the statistics *xitong* (bureaucracy).[8]

While these challenges provide no rationale for data falsification at the national level, they make it potentially difficult for the NBS to compile accurate data. By the second half of the 1990s, researchers began to point out data inconsistencies.

[4] On local data falsification see Zhao (1998), Edin (1998), Cai (2000), or a NBS report of 14 June 2013 posted at http://www.stats.gov.cn/bgt/, accessed 14 August 2013. (I am grateful to Daniel Rosen for bringing the NBS report to my attention.).

[5] For a summary see, for example, Orlik, 2012, pp. 3f. For detailed accounts, see Yang (2012). (I am grateful to Andrew Walder for pointing out this latter source.)

[6] In 1989, the NBS Industry and Transportation Division asked how big the "water content" (*shuifen*), i.e., the degree of exaggeration, in industrial growth statistics was. The answer was "a little bit" (*yidian*), and the explanation for the exaggerated output statistics was predominantly a technical one focusing on compilation methods. Wang and Fewsmith (1995, p. 59) document falsification of the national economic growth rate in 1975 by the State Planning Commission, to which the NBS was directly subordinate at the time: two Politburo members on the evening of December 31, 1975, called the responsible officials of the State Planning Commission and demanded that the reported negative growth rate be immediately changed to a positive growth rate. The State Planning Commission then issued a positive growth rate of 0.056% and the *Renmin ribao* newspaper on the next day reported that the economy had grown in the previous year. (How anyone can know the growth rate of the current year's economy on the last day of the current year, down to the third decimal of a percentage point, is a mystery.) GDP, 1952–2004 (2007) (p. 5) reports a real GDP growth rate for 1975 of 8.7% (and a real GDP growth rate of negative 1.6% for 1976, which makes one wonder if Wang Lixin and Joseph Fewsmith mistook the year); a caveat: at the time, in 1975 (and 1976), the official economic growth figure was not measured using GDP.

[7] For the case of Eastern Europe and Russia, see, for example, Bartholdy (1997), Koen (1996), or Powers (1992). Xu (2000a, 2002) explains some of the continuing imperfections in China's GDP calculations.

[8] In the market (-oriented) economy, paying personnel to report to the statistics *xitong* is not in an enterprise's interest. Similarly, central government departments on which the NBS relies to collect statistical data in their *xitong* have little interest in collecting data on behalf of the NBS, paid for out of their own budgets.