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How can a subset of industry produce more output than all of industry?

As of late 2008, data from the industrial statistics raise renewed doubts about the quality of China's official GDP figures. How can the industry component of GDP be smaller than the value added of a subset of all industrial enterprises?

In industry, the NBS imposes a regular reporting requirement on the group of "all industrial enterprises with independent accounting systems and with annual revenue from principle business in excess of 5 million yuan RMB." Prior to 1998, the reporting requirement covered "all industrial enterprises with independent accounting systems at township level and above, and all industrial state-owned enterprises. On this group of directly reporting industrial enterprises ("DRIEs"), with the change in definition starting in 1998, the NBS has relatively reliable data. To compile data on the remainder of industry, the NBS relies predominantly on sample surveys.

In the industry section of the *Statistical Yearbook*, the NBS publishes detailed output, balance sheet, and profit and loss account data for the DRIEs. This includes the DRIE's value-added. In the National Income and Product Accounts (NIPA) section of the *Statistical Yearbook*, the NBS publishes production approach GDP with a breakdown by sector; these tables include data on industry-wide value-added.

The share of the DRIEs in total industrial value-added has varied over time. As the figure below shows, the DRIEs' share of value-added has fallen continuously from above 95 percent to 75 percent in 1992 and reached a low of 61 percent in 1997 (where DRIE value-added through 1992 has been estimated from net material product data). After the statistical break in the definition of the DRIEs in 1997-1998, their share in industry value-added rose from 58 percent in 1998 to 87 percent in 2004, reflecting the fact that an increasing number of industrial enterprises reached annual sales revenue of 5 million yuan RMB. Following the 2004 economic census, industry value-added in the NIPA was retrospectively revised upward for the years 1993-2004, slightly lowering the share of DRIEs (whose value-added was not revised).

The figure reveals two data problems. First, the jump in the share of the DRIEs from 75 percent in 1992 to 91 percent in 1993 and the subsequent equally drastic decline to 76 percent in 1994 (and to 62 percent in 1995) is not plausible. The concept of value-added was introduced in 1993 only, with data on value-added of the DRIEs available for the years since 1992; enterprises may have experienced difficulty in compiling data on this newly introduced variable in the early years.[1] Alternatively, and less likely, the industry value-added data could be problematic.[2]

A second problem are the 2006 and 2007 shares of DRIEs in the value-added of industry, at 99.7 percent and 109.2 percent. The 2006 share seems far too high, given that in the previous year, 2005, the DRIEs accounted for 93.5 percent of value-added of all industry, itself already a very high value. The 2007 share, in excess of 100 percent, is logically impossible and questions the quality of either the DRIE data or the quality of the NIPA data.

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[1]   DRIE nominal value-added rose by 68 percent in 1993.The ratio of DRIE value-added to DRIE GOV, on a long-term gradual declining trend, jumped by 17 percent in 1993 before dropping by almost as much in the following year.

[2]   The growth rates in nominal industrial value-added of 1993 through 1995 are 38, 37, and 28 percent, while the ex-factory price index of these years is 24, 20, and 15 percent; i.e., the real growth rate appears plausible. Also plausible are the ratios of industry value-added to industry GOV.

DRIE data have always been the cornerstone of industry data and, with industry accounting for almost half of GDP, DRIE data yield a major component of GDP. DRIE data are presumably rather reliable, especially since 1998 with the introduction of the size criterion for enterprises to be included in this group. These are large enterprises with a well established accounting system, which should translate into high-quality data. Furthermore, these enterprises report regularly to the statistical authority, which would suggest that inconsistencies can easily be detected.

But if the DRIE data are correct, then official industry-wide value-added in the NIPA is increasingly underestimated. Consequently, official GDP, which is the sum of value-added across sectors, is increasingly underestimated. Why would the NBS under-report industrial value-added in the NIPA?

The (first) reported real GDP growth rate for 2006 was 11.1 percent (*Statistical Yearbook 2007*, p. 57), a very high value, which may indicate that there was pressure on the NBS to not count, or to under-count, the output of non-DRIEs and thereby to lower GDP. If the 2005 share of DRIEs in industrial value-added were unchanged in 2006, then the 2006 value-added of DRIEs implies an industry-wide value of value-added that raises the 2006 real GDP growth rate by about three percentage points to 14 percent. The 2006 real GDP growth rate was revised upward to 11.6 percent in the *Statistical Yearbook 2008* (p. 40), at a time when public attention was no longer on 2006 data.

The situation in 2007 may then only have become worse, with an officially published real GDP growth rate of 11.9% (*Statistical Yearbook 2008*, p. 40) and no more scope to plausibly underreport industrial value-added in the NIPA except by ignoring the value-added of the DRIEs altogether. Alternatively, value-added of the DRIEs could have been falsified, which should then, however, create apparent inconsistencies across the various DRIE variables on which data are being published, something that is not the case.
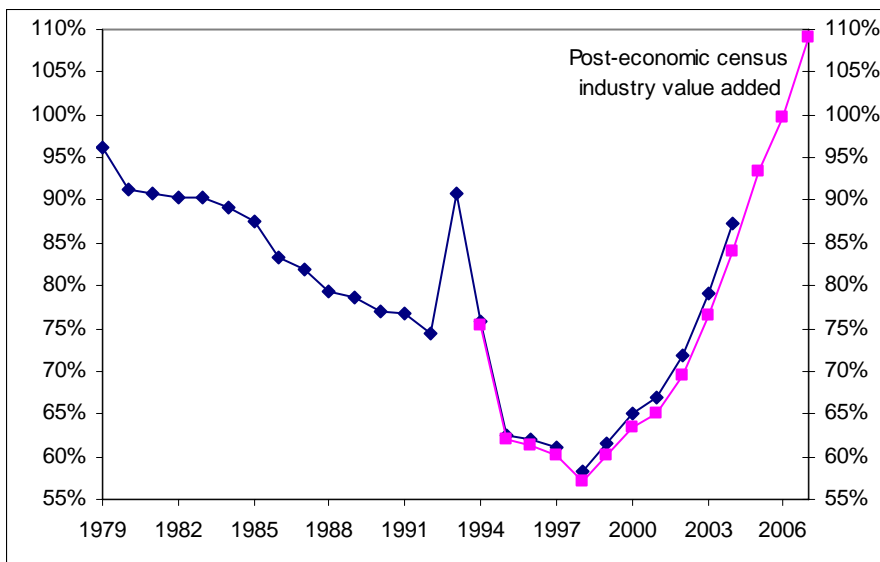
Source: various issues of the *Statistical Yearbook* and of the *Industrial Statistical Yearbook*, and *Seventeen Years of Reform*.

Share of directly reporting industrial enterprises in industry value-added

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