

How Much Do State-Owned Enterprises Contribute to China's GDP and Employment?

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A large sector of state-owned enterprises (SOEs) is well known as the hallmark of the Chinese economy. But exactly how much do they contribute to the country's gross domestic product (GDP) and employment? Since available statistics do not provide a straightforward answer, this note attempts to make some estimations.

I. GDP

China's official statistics, which are released by the National Bureau of Statistics (NBS) in its website² as well as the *China Statistical Yearbook*, do not break down GDP by ownership. Various efforts have been made to estimate the ownership structure of the economy in terms of contributions to GDP. For example, in 2000 when China's domestic private sector started to boom, a study of the International Finance Corporation of the World Bank Group (International Finance Corporation, 2000) broke down China's 1998 GDP into three segments: 37% from the state sector, 12% from the collective sector and 45% from the private sector including rural households. Nicholas Lardy (Lardy, 2014), in examining the role of the private sector in the Chinese economy in early 2010s, conducted detailed analysis of the relevant Chinese data sector by sector. More recently in 2018, Carsten Holz (Holz, 2018) estimated SOE shares in sectorial value-added (VA) and concludes that SOEs contributed 39% of GDP in 2015.

In October-November 2018, senior Chinese government leaders made multiple speeches about China's domestic privately-owned enterprises (POEs), in which they stated that POEs contribute "more than 60% of GDP"³. This provides a basis for an alternative approach to estimation if the definition of "POEs (*minying qiye*)" can be assumed in accordance with its usual meaning in Chinese as excluding (i) foreign invested enterprises (FIEs), i.e., enterprises with investments from Hong Kong, Macao, Taiwan and foreign countries, and (ii) private households in agriculture, which are not counted as "enterprises". As such, the share of SOEs, defined as state-owned and -controlled enterprises⁴, in GDP can be estimated as the residual after deducting from the total the contributions of POEs as well as FIEs and private households in agriculture.

In what follows, two approaches are adopted to estimated SOE share in GDP. The first is a residual approach in which non-SOE shares are deducted from the total. The second is a direct

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² <http://data.stats.gov.cn/easyquery.htm?cn=C01>. Unless otherwise specified, all NBS data used in this note are from its website as well as the *China Statistical Yearbook*, which is also available electronically in its website.

³ See Vice Premier Liu He's interview on October 19, 2018 at http://www.gov.cn/guowuyuan/2018-10/19/content_5332515.htm; and President Xi Jinping's speech on November 1, 2018 at http://www.xinhuanet.com/politics/2018-11/01/c_1123649488.htm. According to them, POEs also account for more than 80% of urban employment.

⁴ See *China Statistical Yearbook* 2018, "Explanation of Key Indicators" of Chapter 13, for a detailed definition of "state-owned and -controlled enterprises".

approach in which SOE share in sectorial VA is estimated and added up in a similar way as Holz (Holz, 2018) did.

A. Residual approach

Foreign invested enterprises

NBS reports data of industrial FIEs, i.e., FIEs operating in mining, manufacturing and public utilities, but data of FIEs in other sectors are harder to come by. FIEs in China include wholly foreign invested enterprises as well as enterprises that are not wholly owned by foreign investors. Some FIEs, esp. joint ventures, can have significant stakes owned by domestic enterprises such as SOEs. It is assumed here that wherever an FIE is controlled by a SOE or domestic private enterprises, the NBS has already treated it as either a SOE or a POE.

In 2017, industrial FIEs accounted for 22% of the core business revenue of industrial enterprises that are above the NBS's cutoff scale (i.e., industrial enterprises that had a sales revenue of RMB20 million or higher), with the rest of 78% accounted for by domestically invested enterprises. Since the secondary industry contributed 40.5% of GDP in 2017, if industrial FIEs' contribution can be assumed as 22%, their contribution to GDP in 2017 should be 8.9% (22% of the 40.5 percentage points).

The share of non-industrial FIEs in GDP is less straightforward. In the absence of output data, one alternative approach is to look at FIEs employment in non-industrial urban sectors, assuming that FIE involvement in rural sectors is negligible. NBS urban employment data show that total FIEs urban employment was 25.81 million in 2017⁵, while industrial FIEs employed 20.52 million⁶, suggesting an urban employment of 5.29 million by non-industrial FIEs. On the other hand, total urban employment was 424.62 million while total employment of industrial enterprises above cutoff scale was 89.58 million⁷. Assuming employment in industrial enterprises below cutoff scale is negligible, non-industrial urban employment was about 335.04 million. As a result, the share of non-industrial FIEs in non-industrial urban employment was 1.6%. If they also contributed 1.6% of China's tertiary industry GDP in 2017, which accounted for 51.9% of the total, the share of non-industrial FIEs in total GDP should be 0.8% in 2017.

Adding together, the share of industrial and non-industrial FIEs in China's 2017 GDP should be around 9.7%.

Private households

According to NBS, the primary industry (farming, forest, animal husbandry and fishing) accounted for 7.6% of GDP in 2017. The primary sectors are dominated by private households but participated by state-owned farms as well other kinds of enterprises. NBS data show that in 2017, the contribution of state-owned farms includes:

- 6.6% of gross value of farming output;
- 3.1% of the number of large livestock and 2.9% of total output of port, beef and lamb;
- 2.5% of total output of seafood.

⁵ Urban employment by type of registration of employers.

⁶ *China Statistical Yearbook 2018*, Table 13-9.

⁷ *China Statistical Yearbook 2018*, Table 13-9.

This allows an estimation as in Table 1 below.

Table 1. Share of State-Owned Farms in Agricultural Outputs (%), 2017

Sector	Sector's share in total gross value of output of the 4 primary sectors	Assumed share of state farms in the sector's output	Estimated share of state farms in total gross value of output of the 4 primary sectors
Farming	53.10	6.6	3.51
Forest	4.56	n/a	n/a
Animal husbandry	26.86	3	0.83
Fishing	10.59	2.5	0.26
Total	100		4.60

Note: n/a = no data available.

Assuming that state-owned farms account for 4.6% of the primary industry GDP, which was 7.6% of total GDP, their contribution to total GDP should be 0.35% in 2017.

There are also POEs in the primary industry whose contribution to GDP is likely already included in the number cited by senior government leaders, but data availability does not allow an estimation of its size⁸. This omission notwithstanding, it seems reasonable to assume that the contribution of private households to China's 2017 GDP is around 7.2% (7.6% minus 0.35%).

Summary

Adding together, the share of FIEs and private households in GDP should be around 16.9%. If the share of domestic private enterprises in GDP is over 60%, the total share of the private sector should be over 76.9%, leaving around 23.1% for SOEs. Table 2 provides a summary.

⁸ There are data for private enterprises and business individuals in rural areas, but they do not necessarily operate in primary sectors.

Table 2. Estimating the Share of SOEs in China’s GDP in 2017 Using a Residual Approach

Contributors by ownership type	Basis of estimation	Estimated contribution (%)
POEs	Official data cited by senior government leaders	60
FIEs	Sum of estimated shares of industrial and non-industrial FIEs	9.7
Industrial FIEs	Assuming their share in secondary industry GDP is equal to their share in sale revenue of industrial enterprises above cutoff scale, which was 22%; secondary industry’s share in GDP = 40.5%.	8.9
Non-industrial FIEs	---- Total urban employment = 424.62 million; total employment of industrial enterprises above cutoff scale = 89.58 million; total non-industrial urban employment = 335.04 million. ---- Total urban employment of FIEs = 25.81 million; total employment of industrial FIEs = 20.52 million; urban employment of non-industrial FIEs = 5.29 million, or 1.6% of non-industrial urban employment. ---- Assuming non-industrial FIEs contributed 1.6% of tertiary industry GDP, which accounted for 51.9% of national total.	0.8
Private households	Primary sectors contributed 7.6% of national total of GDP, of which state farms are assumed to have a share of 0.35 percentage points, based on their shares in outputs of farming, animal husbandry and fishing.	7.2
SOEs	Residual after deducting shares of POEs, FIEs and private households	23.1

B. Direct approach

NBS breaks down China’s 2017 GDP into value-added of 9 sectors, including one of “others”. A direct estimation of SOE share in GDP involves estimating SOE share in each of the 9 sectors. However, there is no VA data at sectorial level for SOEs. One of the closest proxies for VA is “sales revenue of core businesses” (SRCBs), which is reported for nonfinancial SOEs at sectorial level by the *Finance Yearbook of China* (FYC)⁹ published by the Ministry of Finance through its China State Finance Magazine, as well as by NBS for some sectors. However, the FYC uses its own sectorial classification that does not completely match the standard one used by NBS, a challenge that has to be dealt with. In what follows, SOE share in SRCBs is used as a proxy for their share in VA wherever feasible. The estimates and methodologies are described below.

- 1) *Farming, forest, animal husbandry and fishing*: 4.6%. See the previous section.
- 2) *Industry*: 21.1%. NBS publishes data for all above cutoff scale industrial enterprises as well as SOEs (state-owned and state-controlled). To account for the output of below cutoff scale enterprises, it is assumed that they contributed 10% of total output. As such, 2017 SRCBs of all industrial enterprises amounts to RMB125906.76 billion (113316.08 @ (10/9)), while that

⁹ FYC data are based on SOEs’ report. The State Council State Assets Supervision and Administration Commission (SASAC) also reports data for SOEs in the portfolios of SASACs at all levels of the government, but there are non-financial SOEs that are not in their portfolio.

of SOEs, which are assumed to be all above cutoff scale, is RMB26539.30 billion, resulting in a share of 21.1%.

- 3) *Construction: 38.5%*. This is the share of construction sector SOEs' 2017 SRCBs (FYC data) in that of the whole sector (NBS data). SOEs in the construction sector are often more capital intensive than others, implying that its share in sales revenue can be higher than in VA. However, their share in employment (4.9% using the same data) would be an under-estimation.
- 4) *Wholesale and Retail: 36.9%*. The estimation for this is more complicated for two reasons.
 - First, NBS data covers only above cutoff scale as in the case of industry, and there is a huge number of below cutoff scale trading enterprises. Comparison of NBS' 2013 data with the data of Third Economic Census¹⁰ shows that 94% of the wholesale and retail sector legal-person entities are below cutoff scale enterprises and this is mainly an issue of the private sector because SOEs are typically much larger. The same issue exists in the case of industry, but the number of enterprises left out in 2013, using the same date, was 85%. It is therefore assumed that below cutoff scale wholesale and retail enterprises contribute 20% of the sector's SRCBs, making its total RMB61423.28 billion.
 - Second, FYC's classification clusters wholesale and retail with catering and stopped providing breakdown after 2013. In 2013, catering accounted for 3.7% of the sectorial total, which is assumed still the case in 2017. As such, SRCBs of SOEs in wholesale and retail sector was RMB22636.15 billion, or 36.9% of the national total.
- 5) *Transport, Storage and Post: 77.3%*. No SRCBs or other output data is available for this sector, employment is used as proxy. FYC provides SOE employment data every year for two sectors: transport and storage as well as post and communications. However, NBS employment data after 2011 have two subsectors missing: urban transport and communication. The 2011 data of total sectorial employment (7795215) and SOE employment (6023000) are therefore used as proxy, which lead to a SOE share of 77.3%. It is worth to note that employment is an imperfect substitute for output indicator, particularly for this sector. First, the use of 2011 data, the latest year when complete data are available, may overstates the share of the SOEs to the extent that private sector participation (e.g. in express delivery) has increased since 2011; second, it may in the meantime understate the share of SOEs due to a general trend of increased capital intensity. FYC data show that staff and workers of transport and storage and post and communications combined increased only 11.2% from 2007-2017 when their sales revenue did 1.7 times and assets 4.6 times. However, there seems no better data to use for adjustment, as no indicator reported by NBS for these two sectors is breakdown by ownership.
- 6) *Hotel and catering: 8.8%*. NBS data indicate a total SRCBs in hotel and catering in 2017, which is RMB873.6 billion. However, there is no FYC data for this sector due to its unique classification. The NBS does report SRCBs for this sector but only by "registration type", which leaves some SOEs mixed up with non-SOEs in categories such as "limited liability companies" and "joint stock companies"¹¹. This is fixed in the following way:

¹⁰ *China Economic Census Yearbook 2013*, Table A1-09. <http://www.stats.gov.cn/tjsj/pcsj/jjpc/3jp/indexch.htm>.

¹¹ For a detailed discussion on this issue, see (Lardy, 2014).

- In 2011, FYC data for sales revenue of core business of catering SOEs was 0.353 time larger than the sum of "state-owned enterprises" and "wholly state-owned companies" reported by NBS data due to presence of SOEs in other categories of NBS data.
 - Assume this is still the case in 2017. The sum of SRCBs of two categories, "state-owned enterprises" and "wholly state-owned companies", is scaled up by a factor of 1.353, resulting in a proxy for SOE SRCBs in hotel and catering, which is RMB77.23, or 8.8% of the national total.
- 7) *Finance: 88%*. FYC report data only for nonfinancial SOEs. NBS website and *China Statistical Yearbook* do not have output or assets data broken down by ownership. Data from two other sources are used, and the share of state-owned financial institutions in total assets of the financial sector is taken as their share in financial sector VA:
- In its *China Financial Stability Report 2018*¹², the People's Bank of China states that total assets of the financial sector excluding the central bank was RMB273.8 trillion at end of 2017.
 - In a report to the National People's Congress, the State Council states that total assets of state-owned financial institutions at end of 2017 was RMB241 trillion, which is 88% of the total as reported by the People's Bank of China.
- 8) *Real Estate: 24.6%*. NBS reports in *China Statistical Yearbook 2018* that SRCBs of all enterprises in the Real Estate sector was RMB9598.7 billion in 2017; while that of SOEs was RMB2362.5 billion, or 24.6%, according to FYC.
- 9) *Others: 7.7%*. NBS leaves 9 economic sectors in the residual category of "others" when it comes to sectorial VA.
- Six of them have 5 roughly comparable counterparts in the FYC classification. They are: (i) information transmission, computer services and software (NBS) ---- information technology services (FYC); (ii) health, social security and social welfare (NBS) ---- health, sports and welfare (FYC); (iii) education as well as culture, sports and entertainment, two sectors (NBS) ---- education, culture and broadcast (FYC); (iv) scientific research, technical services and geological survey (NBS) ---- scientific research and technical services (FYC); (v) public administrations and social organizations (NBS) ---- administrations, organizations and others (FYC). NBS data suggest 53.22 million of total employment of these five sectors in 2017, while according to FYC SOE employment in these sectors was 2.21 million in 2017, or 4.2% of the total.
 - Three other sectors do not have a counterpart in the FYC classification: leasing and business services; irrigation, environment and public facilities management; services to residents and other services. Their total employment in 2017 was 8.69 million. On the other hand, two sectors of the FYC classification are not matched by NBS data: geological survey and irrigation, social services, with a total employment of 2.54 million. Assuming that NBS and FYC data are comparable for this leftover group of sectors, the share of SOEs is 29.2%. This is mainly driven by the FYC category of

¹² <http://www.gov.cn/xinwen/2018-11/04/5337137/files/48b31c0c3cec41ac977b18a2b6b9590a.pdf> . P175.

“social services” which has grown rapidly over the past decade, but its definition is unclear.

- Taking a weighted average of the above, the share of SOEs in the employment of the 9 “other” sectors left out by the NBS data is estimated as 7.7%, and this is used as a proxy for their share in VA.

With the estimates described above, the share of SOEs in China’s 2017 GDP should be 27.5%. Table 3 summarizes the results.

Table 3. Estimating the Share of SOEs in China’s GDP in 2017: A Direct Approach

Sector	Value added (RMB 100 million)	Assumed share of SOEs in sectorial value added	Estimated value added of SOEs (RMB 100 million)	Estimated share of SOEs in total value added
Farming, Forest, Animal Husbandry, Fishing	64660	0.046	2974	0.004
Industry	278328	0.211	58727	0.072
Construction	55314	0.385	21296	0.026
Wholesale and retail	77658	0.369	28619	0.035
Transport, storage, post	37173	0.773	28722	0.035
Hotel and catering	14690	0.088	1299	0.002
Finance	65395	0.880	57548	0.070
Real estate	53965	0.246	13275	0.016
Others	173571	0.077	13308	0.016
Total	820754		225768	0.275

II. Employment

There can be a direct approach and a residual approach as well in estimating SOEs’ share in employment. However, the direct approach is much more straightforward, because the FYC reports “number of staff and workers” of non-financial SOEs, which was 33.26 million in 2017. For the financial sector, the NBS has data for “state-owned units” employment, 1.43 million in 2017. State-owned units include both SOEs and other non-SOE public institutions such as public service units (PSUs, *shiyue danwei*) but data availability does not allow a separation. However, since state units in the financial sector are dominated by state-owned banks and other financial institutions, which are all SOEs, non-SOE public employment should be very limited. Assuming that it is negligible, total SOE employment in non-financial and financial sectors combined should be 34.69 million in 2017, or 4.5% of a total employment of 776.40 million.

However, this appears to be an under-estimation of SOE employment when a residual approach is used to account for the rest of the 95% of total employment, which can be done as the following using NBS data.

A. Potential Issue of Under-Estimation

There can be four categories of non-SOE employment. The first and biggest is employment of POEs and business individuals (*getihu*), which was 341.07 million in 2017 as per NBS report.

This is 80.3% of urban employment as senior government leaders stated in 2018, and 43.9% of total employment.

Second, since NBS also breaks down POEs and *getihu* employment by urban and rural, it is possible to estimate rural employment other than POEs and *getihu*, i.e., private household employment, which was 237.46 million or 31% of total employment in 2017.

Thirdly, there is also significant non-SOE public sector employment, comprising that of PSUs and government departments as well as their affiliated social organizations (“public management and social organizations”, “administrations and organizations”). This is less straightforward, but following is known:

- PSU employment concentrates in 5 economic sectors¹³ classified by the NBS: “farming, forest, animal husbandry and fishing”, “scientific research, technical service and geologic prospecting”, “education”, “health, social security and social welfare”, and “culture, sports and entertainment”. In 2017, state unit employment in these 5 sectors was 28.97 million.
- The sector of “public management and social organization” employed 17.10 million in 2017.
- Together, there were 46.08 million non-SOE employment in these 6 sectors, accounting for 5.9% of total employment.

Fourth, as shown above, urban employment of FIEs was 25.81 million in 2017¹⁴.

Table 4 summarizes the above, which leaves 91.30 million or 11.8% of total employment unaccounted for. In other word, if the residual approach is taken, the share of SOEs in China’s total employment in 2017 can be 16.3%.

¹³ See (World Bank, 2005).

¹⁴ *China Statistical Yearbook 2018*, Table 13-9.

Table 4. Breakdown of China’s Employment by Ownership Type of Employer, 2017

Employers by ownership type	Employment (million)	Basis of estimation	As % of total
Total employment	776.40	NBS data	100.0
POEs and business individuals	341.07	NBS data	43.9
Rural households	237.46	Rural employment minus rural POE and <i>getihu</i> employment, all NBS data	30.6
Government and PSUs	46.07	Sum of government and PSU employment	5.9
Government	17.10	NBS data, state unit employment in the sector of “public management and social organization”	2.2
PSUs	28.97	NBS data, state unit employment in 5 sectors where most PSUs operate: agriculture, science and technology, education, health and culture	3.7
FIEs	25.81	See Table 2	3.3
SOEs	34.69	Sum of non-financial SOE employment and financial SOE employment	4.5
Non-financial SOEs	33.26	FYC data	4.3
Financial SOEs	1.43	State unit employment in the sector of finance. Assuming it is equal to SOE employment in finance.	0.2
Residual	91.30	Total minus all above	11.8

B. Possible Reasons of the Large Residual

The large residual is not easy to explain. There are two factors that may have played a role.

The first is that SOEs may have not reported migrant workers and other temporary workers as their “staff and workers” in the FYC data, while they are captured in NBS’ total employment numbers. Indeed, NBS did release a number for employment of “state-owned and controlled enterprises” in 2016, which was 45.87 million¹⁵, or 9.67 million larger than the FYC number. However, this is too small a discrepancy to explain the residual of 91.30 million, and it seems NBS reported this indicator only once.

The second is that the employment of PSUs may be under-estimated. There are certainly PSUs in sectors other than the five covered in Table 3. While data availability does not allow a separation of their employment from that of SOEs, the omission should be insignificant. According to an official media report in 2013¹⁶, there were 1.26 million PSUs with 30 million employment, of which about half is found in education and another ¼ in health and agriculture extension services. NBS data shows a total state-owned unit employment of 15.82 million in 2017 in the sector of education. If this is exactly ½ of total PSU employment, the number in Table 3 under-estimates PSU employment only by 2.67 million. Again, this is too small to explain the residual of 91.30 million.

¹⁵ *China Labor Statistics Yearbook 2017*, Table 4-5.

¹⁶ http://www.gov.cn/2013zfbgjdd/content_2365470.htm.

C. Alternative Data

The 3rd Economic Census of 2013 released by the NBS has data on employment of all “legal-person units” in 2013 by 19 economic sectors and by registration type of the units (in its Table A-10)¹⁷. This should have been an alternative set of data for an estimation of SOE employment. Unfortunately, this dataset suffers from two problems.

First, it seems the dataset has mixed up SOE employment with PSU employment. For example, it shows an employment of 19.13 million in the sector of Education, of which 19.10 million is attributed to SOEs, when it is obviously PSU employment.

Second, the dataset uses a classification that combines ownership type and legal form without adding an aggregate indicator for state owned and controlled enterprises, leaving some SOEs mixed up with non-SOEs in categories such as “limited liability companies” and “joint stock companies”. As a result, it is not possible to determine even the sum of employment of SOEs and PSUs.

The 4th Economic Census, which captures data at end of 2018, is scheduled to start data release in 2019. Hopefully the new dataset will offer some new insights.

III. Conclusion

In conclusion, estimations in this note suggest that the share of SOEs in China’s GDP should be 23-28% and their share in employment can be anywhere between 5% and 16% in 2017.

It is worth to note that there are more straightforward data for the shares of SOEs in industrial output and employment. In 2017, SOEs accounted for 39% of assets, 23% sales revenue of core businesses and 18% of employment of industrial (mining, manufacturing and utilities) enterprises whose sale revenue was above a cutoff scale of RMB20 million.

¹⁷ <http://www.stats.gov.cn/tjsj/pcsj/jjpc/3jp/indexch.htm>.

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