

Manufacturing Output in New GDP Series

Some Methodological Issues

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The new gross domestic product series, with base year 2011–12, has mostly replaced the Annual Survey of Industries with corporate financial data for estimating manufacturing value added. This has resulted in its higher share in GDP and a faster growth rate (compared to the older series). The Central Statistics Office claims that the new series better captures value addition, as ASI reportedly left out activities outside the factory of an enterprise. This claim is probably not true, as is evident from closer examination of a sample of ASI primary schedules.

In 2015, the Central Statistics Office (CSO) introduced the new series of National Accounts Statistics (NAS) with 2011–12 as the base year, replacing the earlier series with the base year 2004–05. The new series has followed the guidelines of the United Nations' System of National Accounts (UNSNA) 2008, replacing the earlier template of UNSNA 1994. The revision has, as always, introduced some newer methodologies and updated many databases. However, dramatic and unexpected changes in the levels and growth rates of the gross domestic product (GDP) (and its principal sectors) have caught public and policymakers' attention, raising doubts over the veracity of the new GDP estimates.

Specifically, the manufacturing sector estimates in the new series are in the eye of the storm, since its share in GDP at current prices is larger by about two percentage points (compared to the old series), and its annual growth rates are significantly higher—with a change even in the direction of growth in some cases. For instance, for 2013–14, the growth rate of manufacturing gross value added (GVA) at constant prices swung from (-)0.7% in the old series, to (+)5.3% in the new series (Figures 1a and 1b). Such wide variations in the growth rates for the same years reported by the two series of the same publication, expectedly, drew widespread criticisms, especially since the new estimates were quite at variance with other macro correlates (Nagaraj 2015a).

The new series, CSO has contended, better captures value addition in manufacturing than before. The changeover to the corporate sector database—obtained from the Ministry of Corporate Affairs (MCA)—is said to include activities that were hitherto left out by the Annual

Survey of Industries (ASI), on account of the limitation of its approach to data collection.

Change in Approach

The unit of data collection in the ASI is a factory—that is, the physical (or technical) unit of production. The ASI collected data on registered manufacturing sector units, consisting of all factories employing 10 or more workers using power (or, 20 or more workers without using power) based on their mandatory registration under the Factories Act, 1948. The ASI consists of two parts, namely (i) the census sector, and (ii) the sample sector. Data for factories employing 50 or more workers using power (or, 100 or more workers without using power) are collected on a census basis, whereas those employing 10–50 workers using power (or, 20–100 workers without using power) are surveyed on a sample basis.¹

In the new NAS, the unit of data collection for manufacturing has changed to an enterprise (or, a firm)—that is, an organisational unit of production. In principle, an enterprise could undertake many activities, of which factory (or establishments) production is one. In economic terms, the changeover implies a move from gathering information from the technical unit of production (namely, a factory) to an organisational unit of production (that is, a firm).

The changeover is claimed to better capture manufacturing value addition since the ASI, it was argued, by design,

Figure 1a: Manufacturing Sector's Share in Domestic Output

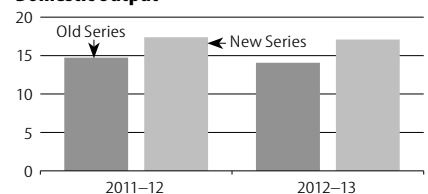
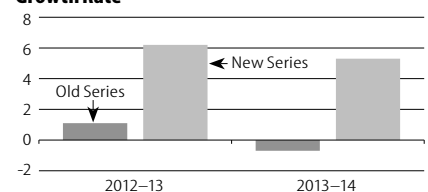


Figure 1b: Manufacturing Value Added Growth Rate



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was not meant to capture value addition taking place outside of the factory—in sites such as the company head office, research and development (R&D) centres, sales and services locations, and so on (in other words, in the entire enterprise). Hence, the CSO has asserted that the value addition captured under ASI was incomplete, hence underestimated.

The use of corporate financial data with an enterprise as unit of analysis, CSO argues, has now overcome the limitations of the establishment approach (hence, that of the ASI). This, reportedly, is the main reason for the enlarged size of manufacturing in GDP (and perhaps for its faster growth) estimates in the new series. Recent availability of corporate balance sheet data, statutorily filed with the MCA, has made such a shift possible.²

To quote the official document to substantiate the foregoing reasoning:

Till recently, the ASI was the only comprehensive source of data for the registered manufacturing sector. However, ASI provides estimates for the manufacturing establishments only, and therefore, does not provide any estimates for trading and other activities that may be provided elsewhere by the enterprise. Therefore, the services carried out by the manufacturing enterprises were not adequately covered in the national accounts. With the availability of the comprehensive MCA21 database, this data gap could be addressed by using the “enterprise approach” for manufacturing also. (CSO 2015a: 73)

Writing about the advantages of the MCA data, T C A Anant (2017) said:

[C]onsider an enterprise with multiple establishments within the same corporate entity, some of which are manufacturing and the others are in services—these may be sales and marketing establishments, R&D establishments, etc. These non-manufacturing establishments will not be registered under the Factories Act. In the old series, the GVA of these activities would be omitted because the ASI would aggregate the value added of the manufacturing establishments, and our enterprise-based coverage in services sector may not include them because they are services establishments within an overall manufacturing enterprise. (p 9)

Anant further added in a footnote:

The critical element is (that) of location. ASI captures data from books of accounts, and if these activities are carried out within the same location then the likely omission is small. However, if the work takes place in a separate location then the risk is higher. Similar issues would arise from a head office,

located away from the site of manufacture. Ideally, we should capture information of the whole enterprise with details of all subordinate establishments, as is done in the US (United States) establishment surveys. In India, until recently, this was not feasible, as the system of registration, under the Factories Act, did not permit a complete catalogue of all establishments within an enterprise. (Anant 2017: 9, footnote 6)

The MCA database is large, consisting of 3–5 lakh companies (out of the universe of about 10 lakh companies) compared to 4,500 large companies under the Reserve Bank of India’s database used for estimating private corporate saving and investment.³ Further, unlike the ASI, corporate results are available within a short time lag of just one quarter (albeit unaudited results). In fact, the delay in processing ASI data has all along been a constraint for the CSO in the timely publication of national accounts.

On the flip side, however, the shortcomings of the quality of the MCA database are by now well-documented, and the multipliers used for blowing-up the sample estimates of the universe of corporate sector are not available in the public domain for an independent verification of official estimates.⁴ The problem with the new series, therefore, boils down to the following question: Does the new NAS series represent a fuller description of the manufacturing value added (MVA), or is it an overestimation? In other words, how true is it that the ASI omitted non-factory value addition of an enterprise (as averred by the foregoing statements)? To our knowledge, the CSO (or its officials) has not offered evidence to support its stated views.

Field Investigators’ Manual

To verify the stated shortcomings of the ASI (as asserted in the foregoing statements), we take a close look at its field investigators’ manual, which by definition, should reveal what and how the field investigators are expected to fill in the ASI schedule (CSO 2016). The following are specific details:

(i) Fixed capital “... would include land, building, plant and machinery, transport equipment, etc. It includes the fixed assets of the head office allocable to the

factory, and also the full value of assets taken on hire–purchase basis (whether fully paid or not) *excluding* interest element. It excludes intangible assets except computer software” (CSO 2016: 7; emphasis added).

(ii) Persons engaged “... is inclusive of persons holding position of supervision or management or engaged in administrative office, store-keeping section and welfare section, watch and ward staff, sales department as also those engaged in the purchase of raw materials, etc, and production of fixed assets for the factory. It also includes all working proprietors and their family members who are actively engaged in the work of the factory even without any pay and the unpaid members of the cooperative societies who work in or for the factory in any direct and productive capacity” (CSO 2016: 8).

(iii) Emoluments “... paid to all employees *plus* imputed value of benefits in kind, that is, the net cost to the employers on those goods and services provided to employees free of charge or at markedly reduced cost which are clearly and primarily of benefit to the employees as consumers. It includes profit-sharing, festival and other bonuses and ex gratia payments paid at less frequent intervals (that is, other than bonus paid more or less regularly for each period). Benefits in kind include supplies or services rendered such as housing, medical, education and recreation facilities. Personal insurance, income tax, house rent allowance, conveyance, etc, for payment by the factory also is included in the emoluments” (CSO 2016: 9).

(iv) ‘Other employees,’ “includes all employees other than workers, viz, clerks in administrative offices, storekeeping sections and welfare sections (hospitals, schools, etc) watch and ward staff. Also, includes employees in the sales department as also those engaged in the purchase of raw materials, fixed assets, etc, for the factory” (CSO 2016: 36). If a salesman employed by a unit is stationed in a different place but getting the salary from the unit producing the medicines, he should be considered as

“other employees,” and his salary recorded accordingly (CSO 2016: 26).

(v) **R&D units** in the factory “... which are engaged for activities in connection with innovation. If available and registered with the Department of Science and Technology (DST)/Department of Biotechnology (DBT), Government of India, code 1 will be reported. If such R&D units are available but registered with agencies other than DST/DBT, code 2 will be reported. Otherwise, code 3 will be recorded. This information is specific to the unit/establishment being surveyed, that is, when the account of the R&D unit is integrated with that of the unit/establishment being surveyed, then only such information is to be recorded here” (CSO 2016: 24).

(vi) **Receipts from non-manufacturing services** (including non-industrial services) “includes all receipts of the factory from others for providing non-manufacturing services, including those of non-industrial nature such as transportation, agency, consultancy, etc. Income due to exchange rate fluctuation should be included here” (CSO 2016: 42).

The foregoing quotations amply demonstrate that the ASI, contrary to the official view, includes all non-manufacturing activities of the factories, in terms of capital and workers employed, and their output. Therefore, CSO's and Anant's stated position on ASI does not hold water. If their comments were meant for establishments within an enterprise devoted exclusively to non-manufacturing activities being excluded from ASI, it needed to be substantiated with a few concrete illustrations.

Filled-in Schedules

To find out if the instruction manual is really followed in recording the data from factories, we sought to gather information from the field in Gujarat and elsewhere. The following are a few telling examples:

3.19 Treatment of Head Office

3.19.0 Information in respect of the assets, employment and expenses of the head office of a factory will be reported in the following manner:

(i) If the head office is controlling only one factory and is situated in the same town where the factory is situated or outside but within the same State, the information of the head office will be included in the factory return. (CSO 2016: 55–56)

Example 1: Ambuja Cement Company has a factory in Porbandar district and its head office is located in Ahmedabad district, both in Gujarat. The information of the head office is, in fact, included in the ASI returns.

Example 2: The entire sales force is working either in the same state or out of state, but all are included under the ASI. The Navneet Education Limited, Ahmedabad, is a publishing enterprise having more personnel engaged in sales activity than the manufacturing activity. Here, all the salespersons have been accounted for under the ASI survey.

Example 3: Similarly, Zydus Cadila is a pharmaceutical enterprise having larger spread of marketing staff as compared to workers engaged in manufacturing activity. All the marketing staff has been included under the ASI.

Example 4: Arvind Limited (formerly Arvind Mills), Ahmedabad has a sales outlet within the head office premises, the entire activity of the sales is covered under the ASI.

(ii) If the head office is controlling more than one factory and is situated in the same State, data in respect of head office will be included in any one of the factories. (CSO 2016: 56)⁵

Example 5: For an enterprise such as Tata Chemicals, having more than one factories in the state and head office in Ahmedabad, the data of the head office would be incorporated in any one of its units in Gujarat. The selected unit may, however, differ year after year.

(iii) If the head office controls a number of factories situated in different states, the information of the head office will be accounted for in the return of a factory situated in the same State. (CSO 2016: 56)

Example 6: Reliance Industries has a large number of units in Gujarat and Maharashtra. Since its head office is located in Mumbai, the activity of the

head office will be accounted for with its unit in Maharashtra. It is important to note that it is ultimately covered in one or the other state.

(iv) If the head office is situated outside the State, where factories were located, its assets, employment and expenditure are not to be included in the return. In no case, allocation of the head office information will be made among the individual units. (CSO 2016: 56)

Here is a case when the head office data will be missed in the ASI. This is what Anant (2017) and CSO (2015a) are pointing out as possibilities. However, it should be clear that their arguments are limited only to this particular case and that they are factually incorrect in the rest of cases.

To sum up the evidence, the field experience mentions six cases and related instructions. Only the item (iv) above (without any evidence though) is a clear case where the head office data would be missed by the ASI. Also, in item (ii) above, there is a possibility of the head office data being missed in some cases, but its probability is low (see footnote 5).

Clearly what CSO (2015a) and Anant (2017) are saying is confined only to these two cases and cannot be generalised to the ASI as a whole. Even in those two cases, it is only a matter of chance and probability because, in any case, the sample figures are blown to population. So, it only increases the probability of under-reporting and not confirmed under-reporting.

Summary and Conclusions

The new series of NAS with the base year 2011–12 shows that the manufacturing sector's share in GDP at current prices is significantly higher, and its growth rate much higher than those reported in the older series (with 2004–05 base year). The large observed divergence gave rise to serious doubts about the veracity of the new estimates. Moreover, the reported high growth rates were at variance with other macroeconomic correlates.

In the older NAS, the registered manufacturing sector output, accounting for two-thirds of the manufacturing value

added, were estimated using the ASI, whose primary unit of data collection is a factory (or an establishment). The CSO has argued that this method failed to capture output produced by an enterprise outside of factories (resulting in an underestimation). The latest revision has, therefore, replaced the ASI with the corporate financial database which uses an enterprise (or a firm) as the primary unit of data collection. Considering the known limitations of the corporate financial database of MCA and its methodological shortcomings, critics have wondered if the revised GDP series has overestimated the size and growth rate of manufacturing sector value added.

Considering the seriousness of the change in the approach to data collection, the article has sought to examine if the CSO's claims about the shortcomings of ASI are in fact true. A careful perusal of the ASI's *Instructions Manual* provided to field investigators amply demonstrates that the official contention is largely incorrect. The ASI, in fact, captures employment, investment, and value added of activities outside of the factory, such as the head office, R&D, sales and services, and so on that are part of the enterprise in most of the cases. We have then sought to corroborate these findings with the ASI filled-in questionnaires for select enterprises and their factories operating in Gujarat and elsewhere. Information gathered from the field supports our contention: the ASI, in fact, includes value addition in activities outside of factories such as company headquarters and sales force.

The examples cited in the article contradict the official claim to a large extent. Therefore, the very basis of the change in the approach to data collection for estimating manufacturing GDP seems questionable. Hence the higher share and faster growth rate of manufacturing sector reported in the new GDP series seems to have little justification based on mere coverage of ASI. There may, however, be other reasons for expecting the size of the sector and its growth rates to be higher, but the arguments put forth against the ASI as under-reporting value added in manufacturing do not seem to be convincing.

NOTES

- 1 The unregistered sector consisted of non-factory establishments and household enterprises, whose output was captured *indirectly* as a product of (i) output per worker, and (ii) estimated number of workers employed. Various National Sample Survey (NSS) rounds of sample survey data were used to estimate value added per worker. The NAS used to publish the value added estimates at disaggregated (two-digit National Industrial Classification), separately for the registered and unregistered sector.
- 2 There are many other methodological changes for the manufacturing sector, but not mentioned here as they are not germane to the issue under consideration.
- 3 Previously, the NAS did not estimate GVA of private corporate sector, though it could be indirectly derived.
- 4 To understand the core of the debate, refer to Nagaraj (2015a, 2015b) and CSO (2015b).
- 5 However, the concerns would be that in the sample sector if a factory has a head office at a different location, it is most likely to be not considered if the same head office controls more than one factory. This is because as per the instructions, the head office can merge with any one of the factories - the selected sample factory is generally not likely to report the HO data. This concern would be carried forward to the cases where all factories of the same company are in the sample sector only and certainly all of them would not get selected in the sample. So, the head office figures would

be missed or under-reported. The same would happen to sales force and other related activities/services. We may, however, note that sample sector data is invariably blown up with multipliers to get the population estimates. All it may imply is that such multipliers may get affected in such cases.

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