

## **International Workshop on Measuring GDP by Final Demand Approach**

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**Viet Vu**

### **Background**

1. This workshop was part of a series of events organized under the project on strengthening statistical capacity development in China and other developing countries in Asia, funded by the Chinese Government. It was organized in two parts – international and domestic. The workshop brought together over 90 experts from 16 countries in Asia - Cambodia, China, Hong Kong, India, Indonesia, Korea, Laos, Macao, Malaysia, Mongolia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand and Vietnam as well as Canada, with different experiences, circumstances and needs. The domestic part of the workshop was organized particularly for the Chinese participants from the National Bureau of Statistics and some of the provincial offices to discuss China's practice in compiling GDP by final demand approach and the reasons for the inconsistencies between the national GDP measured from the production and expenditure sides.

2. Mr. Frederick Ho (Hong Kong), Mr. Arthur Berger (Canada), Mr. Vu Q. Viet (UNSD consultant) and Mrs. Youlia Antonova (UNSD) served as resource persons.

3. Similar to the previous workshops, the UNSD consultant will finalize an operational guide using commodity flow approach for compiling GDP by final expenditure as a training material. This manual will be based on the presentations made at the workshop, the conclusions reached during the course of the workshop, and supplementary research.

### **Objectives of the workshop**

4. The objectives of the workshop were to give an overview of one of the main approaches to GDP compilation – the final demand approach - and to address specific issues of measuring the final consumption expenditures of households, government and non-profit institutions serving households, and estimating gross capital formation for the economy and by sector. The estimation of national accounts' imports and exports of goods and services from foreign trade statistics and other sources was also discussed. The

workshop further provided a discussion forum for country and international experts to share experience and identify challenges in measuring GDP by final demand approach. Proceedings of the workshop will provide the basis for the preparation of an operational guide on compiling GDP by final expenditure which will assist countries in further strengthening their national programmes on national accounts.

## International workshop

5. The international part of the workshop devoted three days with international and Chinese experts to discuss the conceptual framework and compilation methodology, particularly the use of commodity flow approach for deriving its main components of final demand in current and constant prices and countries' practices in compiling GDP by final demand approach. By reviewing the current practices of various countries within the conceptual framework of the SNA, the workshop aimed at providing practical guidance and proposing best approaches to improve the measurement of some specific expenditure categories.

## Main findings and conclusions

### (a) Measurement of GDP by final demand approach independently rather as a residual.

6. National Statistical Offices were encouraged to measure independently GDP by final expenditure, and to reduce to the minimum possible the measurement of individual expenditure category as a residual between GDP (production) and GDE (expenditure).

### (b) More focus on direct measurement of inventories

7. Particularly important is the independent measurement of changes in inventories. Ratios of inventories over outputs provide important information on the short-term development of the economy. It is also important that inventories be prepared separately for materials and supplies which are used to compute intermediate consumption; work-in-progress and finished goods which are used to compute gross output.. Some countries that participated in this workshop, unfortunately, still treat changes in inventories as residuals, which include statistical errors.

Table 1. Estimation of output from sales – an example

	Calculating operations	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
<b>Information given</b>					
1. Sales net of taxes and plus subsidies			80	120	272
2. Price index			100	125	200
3. Value of inventory at end of period (book value)		0	40	30	16
4. Change in inventory (book value)	= (T <sub>i</sub> – T <sub>i-1</sub> ) applied to line (3)		40	-10	-14
<b>Derived data</b>					
5. Value of inventory at constant prices	= Line (3)*100/ line (2)	0	40	24	8
6. Change in inventory at constant prices	= (T <sub>i</sub> – T <sub>i-1</sub> ) from line (5)		40	-16	-16
7. Change in inventory at current prices	= Line (6) * line (2)/100		40	-20	-32
8. Output at basic price	= Line (1) + line (7)		120	100	240

8. The proper revaluation of inventories at market prices to replace book values as practiced in business accounting is important in correctly measuring inventories and output. The approach to calculate non-farm inventories (on which data on quantity of inventories are not available) as practiced in Canada is recommended. Table 1 above shows an example of revaluing inventories and calculation of output from sales.

**(c) Use of commodity flow approach recommended**

9. The workshop strongly supported the use of commodity flow approach as a systematic and consistent frame for the estimation of GDE. It is a simple form of supply and use tables (SUT), applicable in cases when national accountants do not have full set of data. The approach is based on using the benchmark SUT when it is available; when benchmark SUT is not available, simple ratios based on limited surveys or expert opinions may be used instead.

10. Due to cost constraint and time requirement to process data, detailed SUT is normally prepared for benchmark years only. In between them, an extrapolation by ratios from the base year to the current year should be applied to measure wholesale and retail trade margins, transport margins and taxes on products. The following allocation rules are recommended:

- a. Trade and transport margins: Normally margin on a given product is allocated proportionally to the values of products used;
- b. Taxes on products: Taxes are distributed proportionally to the values consumed, excluding consumption categories that are either not subject to taxes or subject to tax deduction;
- c. Allocation rules for supply of other goods and services destined to final expenditures:
  - i. The following information are required and normally available:
    - Industry output in basic prices
    - Product price indexes (producers' price indexes, consumer price indexes, import price indexes and export price indexes
    - Data on exports and imports
    - Preliminary data on general government FCE and GCF
    - Limited information on household FCE
  - ii. The following needs to be done:
    - Convert industry output to product output in purchasers' prices
    - Deflate product output
    - Estimate trade and transport margins in constant prices
    - Estimate products consumed as intermediate inputs in constant prices
    - Estimate total products that can be used for GCF and household FCE in constant prices and then reconvert them back to current prices.

#### **(d) Acquisitions less disposals of Valuables**

11. Acquisitions less disposals of Valuables are part of the SNA assets boundary, however countries are advised that not all items that may be described as precious metals and stones, antiques and other art objects should necessarily be included as valuables in the balance sheet of the owner, which could be a household as well. Only those items regarded as **alternative form of investment (for example gold and paintings instead of financial assets) should be captured**, the remaining part, if owned by households should be recorded as final consumption expenditures of households. Transactions in monetary gold are not treated as final consumption. The SNA2008 defines physical gold bullions as monetary gold when held as reserves by monetary authority. Non-monetary gold as an alternative form of investment could be in principle treated as valuables and can also be used as intermediate consumption (in the production of other goods), added in inventory, and entered into supply through imports or demanded as exports. Exports of non-monetary gold (without production) if recorded must be balanced by negative gross capital formation (or disposal of valuables or reduction in inventories). However, in the case that physical gold held by households as stores of value and transacted with non-residents through country borders, countries may choose to treat it similarly to monetary gold and not recorded as exports and imports when they have not been previously recorded in inventories or assets of valuables. In such a case, the recording of transactions of gold in exports and imports (which are not produced and not used for the purpose of production in the accounting period) may distort their analytical meaning.

#### **(e) Distinguishing fees and taxes**

12. Licences and fees - payments of households to government units to obtain various kinds of licences, permits, certificates, passports etc. are not always clear, i.e. whether these are payment for services or de facto taxes.

13. It is recommended that following the SNA 2008, payments by households for licences to own or use vehicles, boats or aircrafts and those for recreational hunting, shooting or fishing are treated as taxes as no actual services are provided by government. Payments for licences to undertake a specific activity such as a taxi licence are treated as a tax on production.

14. Payments by households for all other kinds of licences, permits, certificates, passports, etc. that require government services such as inspection, should be treated as purchases of service and included in household consumption expenditure.

#### **(f) Owner-occupied dwellings**

15. Owner-occupied dwellings – total imputed output value of housing services should be recorded as final consumption expenditure of households. It is important to note that costs of regular maintenance and repair should be treated as intermediate consumption of this activity which provides services of owner-occupied dwellings. Consumption of fixed capital is based on the depreciation of the dwellings.

16. The purchase of dwelling itself should be recorded as gross fixed capital formation.

### **(g) Deflation of FISIM**

17. Financial and insurance services, including FISIM, as part of the final consumption expenditure of households, general government and NPISHs in current and constant prices should be estimated according to the SNA 2008 rules. In the absence of an explicit international recommendation for the deflator of FISIM, countries may apply a more conservative approach by using a broad index (such as the GDP deflator) to avoid fluctuations from year to year.

### **(h) Deflation of R&D, software, etc.**

18. The cost of production approach is recommended for the measurement of some of the new assets categories, such as capitalization of the research and development, computer software and databases, etc. They should be also deflated by the cost approach.

### **(i) Deflation of imports and exports**

19. Imports and exports of goods and services – the workshop agrees that the use of unit value indexes (UVI) as deflators for the imports/exports of goods should be avoided, particularly when products included in the calculation of UVI are not homogeneous. Instead imports/exports price indices are recommended to be developed. The IMF's *Export and Import Price Index Manual: Theory and Practices* (2009)<sup>1</sup> should be consulted.

### **(j) Deflation of government output and government final consumption**

20. Government final consumption expenditure includes:
- Non-market output of general government after deducting the fees for services paid for by industries and households is treated as government final consumption expenditure;
  - Government purchases of goods and services which are paid for by the government and distributed without transformation to households; and
  - Household purchases of goods and services but reimbursed by government.

21. General government final consumption expenditure in constant prices should be calculated separately of each of its components listed in para 20. Purchases of goods and services for final uses are deflated by price indexes of the goods and services bought by government. The non-market output should be deflated by the cost approach, which means that goods and services used as intermediate consumption should be deflated by price indexes of the goods and services bought and the wage component should be deflated by the wage rates. To be more reliable and to capture changes in productivity, wages may be disaggregated by type of labor and deflated by its own wage rates. The use of CPI to deflate wages should be avoided, unless no other price indexes are available.

22. In this case, the deflation of output and final consumption expenditure of government is fully integrated and therefore no discrepancy between GDP by production

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<sup>1</sup> [www.imf.org/external/np/sta/xipim/pdf/xipim.pdf](http://www.imf.org/external/np/sta/xipim/pdf/xipim.pdf)

approach and final demand approach is expected to result due to the treatment of general government.

### **(k) Extra-budgetary funds of government**

23. The workshop recommended that NSOs should have full information about the extra-budgetary funds and accounts operated by some of the government units. The application of the 50% and over criteria of government subsidy to the total operational costs of these units should be used to decide if they be included as part of the government sector. Services which might be subject to detailed scrutiny include postal services, broadcasting, urban transportation, etc.

### **Domestic workshop**

24. Three comprehensive presentations by NBS experts were made during the domestic part of the workshop – Estimation of the China's Consumption Expenditure of Government and Change in Inventories; Analysis of inconsistency between GDP and GDE and Estimation of China's Net Export which were followed by discussions between Chinese experts and resource persons. The following conclusions drawn from the discussions could serve as useful reference for the future improvement of the NA compilation in China.

### **Main findings and conclusions**

25. The issues which China faces with government consumption are mainly with the constant prices. So far, China uses CPI as deflators. As CPI grew at a much lower rate than the wage rates, the use of CPI to deflate government output may bring its growth rates higher than it should be. A recommendation is made to change CPI with the wage growth rate and use some employment indicators to account for difference in productivity. This deflator should be aligned with the deflator for the government services used in the production approach. This issue has already been discussed in more detail above.

26. The collection of data on inventories should be improved and they should be presented at least by type (raw materials, work in progress, finished products and goods bought for resale). At present, annually China has only total inventories by industry, which does not allow for proper deflation and estimation of the output and intermediate consumption. Quarterly data are even less satisfactory. The increase of inventories of 5 years in a row does not seem right as total inventory may increase but changes in inventory may not be positive for a long period of time. The problem should be carefully analyzed.

27. Current expenditures on defence are available as a lump sum and China uses ratios to split it. China is advised to pay special attention to the capitalization of weapons, which should be capitalized in the 2008 SNA, unlike the 1993 SNA which treats them as current expenditures of the general government sector.

28. The constant prices of imports and exports are derived by using the Unit Value Indices (produced by Customs). China is aware that there are problems with them.

Cooperation with Customs, use of real price indices of imports and exports, establishment of register of exporting companies, use of indices of major import partners is recommended. See also discussion above.

29. To help balance better gross domestic expenditure (GDE) and GDP China needs to prepare SUT. China has a project with OECD. One of the potential reasons for the discrepancy could be the compilation of construction which is different for the production approach (relying on establishment data) and expenditure approach (relying on investment funds). The compilation of production and expenditure approach for construction should be harmonized to yield the same values. Review of the compilation is recommended.

30. It seems that there is a problem in treating consumer subsidies in China. The SNA does not have the concept of consumer subsidies. The treatment should be as follows:

- If government provides subsidies to households either fully or partially for households to buy goods and services that are specified in advance by the government for social security, social benefits or promotion of consumption, the amount paid for by the government should be treated as government individual consumption expenditure of goods and services to benefit households.
- If the government provides subsidies to industries to reduce prices of goods and services sold to households, then the payment is other subsidies on production (part of value added of industries).
- If the government provides cash for individuals and/or households to buy goods and services at their own choices then they should be treated as current transfers from government to households.