Background

Statistics on Gross Domestic Product (GDP) of Hong Kong are compiled in accordance with the international statistical standards as stipulated in the System of National Accounts 2008 (2008 SNA). For Hong Kong, GDP is compiled using the expenditure approach and the production approach. The following breakdowns of GDP are available:

(a) by expenditure component, which includes private consumption expenditure; government consumption expenditure; gross domestic fixed capital formation; changes in inventories; exports of goods; exports of services; imports of goods; and imports of services.

(b) by economic activity, in which economic activities are classified according to the Hong Kong Standard Industrial Classification (HSIC), with one additional item of ownership of premises, according to the national accounting convention.

GDP by expenditure components includes annual and quarterly series, both at current prices and in chain volume terms. As for GDP by economic activity, it includes annual series at current prices; and annual and quarterly series in chain volume terms. GDP compiled by the expenditure approach which is better established is presented as the single measure of GDP.

Data sources and estimation methods for compiling quarterly national accounts

Data sources for compiling quarterly GDP by expenditure component include external trade statistics; quarterly and monthly surveys on industrial / business establishments and on households; government accounts and administrative data from government departments and other organisations.
A brief summary of the estimation methods for compiling quarterly GDP components by expenditure approach at current market prices is shown below:

*Private Consumption Expenditure*

Private consumption expenditure is estimated by first compiling estimates of consumption expenditure on goods and services in the domestic market, then adding residents' expenditure abroad for non-business purposes, and deducting expenditure of non-residents in the domestic market.

For consumption expenditure in the domestic market, while the benchmark estimates are largely derived using the commodity flow method, the quarterly estimates are derived by extrapolation of the benchmark data using value indicators (e.g. retail sales, restaurants receipts), volume indicators (e.g. population, employment in selected services industries), and administrative records (e.g. rental of public housing). The estimate of residents' expenditure abroad is derived by multiplying the number of residents' outbound trips (based on administrative records) for non-business purposes by the estimate of per resident person's expenditure abroad (based on household survey data).

Main data sources include external trade statistics, economic surveys, household expenditure surveys and administrative data.

*Government Consumption Expenditure*

Government consumption expenditure is computed as the sum of compensation of government employees and purchases of goods and services by the government units, less sales receipts for goods and services provided by these government units. Government purchases of goods and services include the consumption of fixed capital which is estimated using the perpetual inventory model.

Quarterly figures of government departments which are not engaged in market activities are obtained from the Treasury. Data in respect of quasi-government non-profit institutions are obtained from special enquiries on the income and expenditure of these institutions.

*Gross Domestic Capital Formation*
Building and construction

It relates to the value of construction works put in place as well as the real estate developers’ margin. Quarterly statistics for the private sector are compiled using data collected from the Quarterly Survey of Construction Output. For the public sector which covers government departments, quasi-government institutions and public corporations, relevant data are obtained from their administrative records.

Costs of ownership transfer

Expenditure on stamp duties is based on the amount of stamp duties collected by the government in connection with property transactions. Expenditure on legal fees and real estate agents’ commissions is computed based on the number of property transfer cases registered with the Land Registry, the average property transaction value and the average rate of charge.

Machinery, equipment and intellectual property products

Investment expenditure on machinery and equipment is mainly compiled using the commodity flow method. Data on expenditure on intellectual property products by the private sector are mainly collected through surveys and that by the public sector are obtained from records of government accounts and returns of respective bodies.

Change in inventories

Changes in inventories are derived as the difference in book value of inventories between the beginning and the end of the reference period, with adjustment for appreciation (or depreciation) in the value of inventories within the period. Data are collected from the Monthly Survey of Retail Sales, the Quarterly Survey of Service Industries and the Quarterly Survey of Industrial Production.

Imports and Exports of Goods and Services

Imports and exports of goods

Exports of goods include domestic exports and re-exports of goods recorded on free-on-board (f.o.b.) basis; imports of goods are also valued on f.o.b. basis by removing values of insurance and freight costs as estimated from results of the Monthly Survey on Insurance and Freight Costs for Import Trade from the import values recorded on cost, insurance and freight (c.i.f.) basis under the external trade statistics system.

Imports and exports of services

Data on expenditure of incoming visitors and travellers are based on visitor survey
conducted by the Hong Kong Tourism Board. The estimate of residents' expenditure abroad is compiled from data from household surveys (for per capita expenditure abroad of Hong Kong residents) and administrative records (for the number of outbound trips by residents). For services other than travel, while the benchmark estimates are based on data from annual surveys on imports and exports of services, the quarterly estimates are compiled by extrapolation of the annual benchmark data using quarterly value and volume indicators from quarterly surveys and administrative records.

As for GDP by economic activity, data sources for compiling quarterly volume estimates mainly include quarterly and monthly surveys on industrial / business establishments and on households; government accounts and administrative data from government departments and other organisations.

The volume estimates of GDP by economic activity in Hong Kong are generally compiled using four methods: (a) single extrapolation of previous year value added by deflated gross output measures (e.g. business receipts deflated by PPI); (b) single extrapolation of previous year value added by volume / quantity measures such as volume of trade and physical units of outputs; (c) single extrapolation of previous year value added by input indicators such as hours worked; and (d) double indicators method. The first two methods are most frequently applied in Hong Kong for compiling quarterly volume estimates of value added.

**Methods for rebasing GDP**

To compile the volume measures of GDP and its components, the annually re-weighted chain linking approach is adopted. For a particular year, the volume estimates of major components of GDP revalued at preceding year prices are first derived by “deflating” the current price values of subcomponents by the relevant price indices (or in some cases by revaluing the current period quantities at preceding year prices) at the most disaggregated levels. The volume estimate of GDP is then obtained by aggregating the volume estimates of GDP major components revalued at preceding year prices. With the effect of price changes eliminated, the volume estimate reflects the real growth of GDP. The preceding-year weighted volume measures of GDP and its components are chain linked to a selected reference year in order to obtain a continuous time series of the chain volume measures of GDP and its components.
Challenges

While the development of statistics in Hong Kong since the 1980s has provided many new data sources, there are still areas where estimates are less firmly based because of various limitations. In general, data sources for compiling quarterly GDP are less solidly based than those for compiling annual GDP. Quarterly surveys, which are one main source of data for the quarterly GDP, normally incur smaller sample size and collect less detailed information as compared with annual surveys on which the annual GDP figures are based.

Moreover, as accounts data are used in compiling government consumption expenditure, the figures are derived on a cash-flow basis rather than accrual basis. To the extent that the cash-flow pattern varies from year to year, this component exhibits considerable short-term fluctuations in the quarterly series. However, adjustments have been made to some important types of expenditures to approximate accrual-based data.

While the procedure in the compilation of volume estimates of GDP is relatively straightforward, where the deflation method is used, there are some practical issues associated with the choice of index numbers. For instance, current-weighted price indices, strictly speaking, are required for deflating current values. But price index series, e.g. the Consumer Price Index (CPI), is usually available in base-weighted form and current-weighted series is not available. This, however, will unlikely introduce serious problems to the GDP volume series, especially when the deflation process is carried out at the most detailed level.

Besides, although various sources of information are used as far as possible to develop specific deflators for different categories of imports and exports of services, there are still limitations in the volume measures. There are difficulties not only due to the lack of data but also in defining the relevant deflators for various types of services. Hence, the volume measures cannot be very precise.

Quality practices

To achieve a balance between timeliness and data quality, C&SD follows the international practice to compile and release GDP figures at the earliest possible time by using partial data, and revise these figures as more information becomes available. In Hong Kong, the first released GDP statistics in respect of a period are called
“preliminary figures”. All those figures published subsequently, on revision, are called “revised figures”. In general, the figures are finalised when data from all regular sources are incorporated. The GDP series is also subject to routine revision to incorporate benchmark data available at less frequent intervals, e.g. results of the Household Expenditure Survey conducted once every five years, and results of the Bank for International Settlements triennial survey of foreign exchange and derivatives market turnover.

In Hong Kong, GDP is compiled by the expenditure and production approach. Reconciliation between the production measure and expenditure measure of GDP is conducted regularly. When GDP figures compiled using such approaches differ widely, the data sources and methods of both approaches have to be thoroughly investigated.

Besides, in the course of the routine compilation of the GDP statistics, the direction and magnitude of revisions between the previously published data are looked into. Any significant changes arising from the revision are investigated and the underlying reasons for such changes are studied. Track records of revisions are maintained to identify the pattern in the data revision. Systematic revision pattern, if any, will be taken into account in refining the preliminary data and the data collection programs as appropriate.

Based on the differences between the first estimate of the GDP and the revised figure released three years later which has incorporated data from all regular sources, the “average revision” and “average absolute revision” of the year-on-year real growth rates of quarterly GDP are compiled. The revisions between the preliminary and revised figures are generally small. The “average revision” and “average absolute revision” which measure the direction and size of revisions respectively are useful for assessing the reliability of the first estimate.

In addition to the routine revisions, it is an established practice of C&SD to undertake non-routine technical revision exercises from time to time to enhance the quality of Hong Kong’s GDP statistics by incorporating new data sources, improved estimation methods, and changes in international standards, definitions and classifications where applicable, which are results of continuous research and development on the GDP compilation framework. This is in line with the international practice to improve the quality and reliability of GDP statistics on a continuous basis. In a non-routine revision exercise, the entire series of GDP and its components may be subject to
revision in accordance with the scope of the exercise concerned.