

**Gross Domestic Product Non-routine Revision
(1994 Revision)**

The Census and Statistics Department has recently completed a non-routine revision of Gross Domestic Product (GDP). The results were released in August 1994. This article discusses the improvements made to the GDP compilation framework through the revision exercise.

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Concepts and Methods of Compiling GDP Estimates

1. GDP is an aggregate measure of the total value of net output produced within the domestic boundary of a country or a territory in a specified period, say a calendar year, before deducting allowance for consumption of fixed capital. GDP can be measured using different approaches. For Hong Kong, the Census and Statistics Department (C&SD) compiles annual GDP estimates using the "expenditure" approach and the "production" approach, and quarterly GDP estimates using only the "expenditure" approach.

2. Under the expenditure approach, GDP is measured as the total value of goods and services produced for final use, net of their import content. Goods and services for final use include those consumed by households and government, those for capital formation and those for export. GDP estimates from the expenditure approach are compiled based on many different sources of data including industrial and commercial establishment surveys, government accounts, trade statistics and other administrative sources. Expenditure-based GDP estimates are available at both current market prices and constant market prices.

3. Under the production approach, GDP is computed as the sum of net output or "value added" of resident productive units such as factories, shops and service organisations. It shows the contribution of various economic activities (manufacturing, construction, distributive trades, and so on) to the total GDP. Value added is derived as gross output less intermediate consumption (i.e. value of non-durable goods and services used in production). GDP estimates from the production approach are produced mainly based on data collected from the Programme of Economic Surveys of the C&SD and on administrative statistics. Production-based GDP estimates are only available at current prices.

International Standard

4. The compilation of GDP follows basically the international standard and guidelines as laid down in the "System of National Accounts" promulgated by the United Nations, being the results of research and consultations amongst statistical experts around the world. However, as differences exist in economic structures and commercial practices in different economies, the technical standards and guidelines have to be adapted to suit local circumstances.

5. At the end of 1993, the United Nations released a revised version of the System of National Accounts and recommended it be adopted by all countries and territories in due course in compiling national accounts estimates.

Revision of GDP Estimates - Routine versus Non-routine

Routine revision

6. In line with international practice, the C&SD compiles and releases GDP estimates at the earliest possible time by using only partial data, and revises these estimates as up-to-date data become available. The first released estimates are called "Preliminary estimates". Estimates subsequently revised are called "Revised estimates", qualified in brackets by the month and year in which they are released. Estimates with data from all regular sources incorporated are called "Final estimates". Due to the time taken for data from all sources to be available, final estimates are available around the third March after the reference year.

7. As an illustration, in the case of expenditure-based GDP estimates, for which quarterly estimates are compiled, preliminary estimates for, say, the first quarter 1991 were released in August 1991; first revised estimates were released in November 1991 as Revised(November 1991) estimates, second revised estimates released in March 1992 as Revised(March 1992) estimates, and so on; and final estimates were released in March 1994.

8. The above processes of compiling preliminary estimates, revised estimates and final estimates constitute the **routine revision** of GDP. For all the estimates, the same compilation framework and methods of estimation are used. The differences between the estimates are entirely due to more data available for each later estimate than earlier ones.

Non-routine revision

9. Besides routine revisions, other revisions are conducted by statistical authorities once every few years to incorporate new data sources, improved estimation methods, and changes in definitions and classifications which are the results of continuous research and development on the GDP compilation framework. This is in line with international practice to improve the quality and reliability of GDP estimates. Such revisions are called **non-routine revisions**. Unlike routine revisions, non-routine revisions do not just revise GDP estimates up to three years ago. In each round of non-routine revision, the entire GDP series is revised so as to ensure that new data sources and estimation methods introduced are applied as far as possible to the whole series of GDP estimates and that data on the entire series are comparable to each other.

10. The C&SD has recently completed the fifth round of non-routine revision of Hong Kong's GDP. The results were released in end August 1994. Results of the previous four rounds of non-routine revision were released in 1980, 1984, 1987 and 1991 respectively.

Highlights of the 1994 Non-routine Revision

11. In the 1994 non-routine revision, both the expenditure-based GDP and the production-based GDP are revised. Improvement to the GDP compilation framework is made in respect of a number of areas. Of these, some are related to the expenditure-based GDP and some to the production-based GDP. The improvement which is particularly worth highlighting is that of the coverage of trade in services.

12. Since mid-1980s, Hong Kong has experienced a fundamental change in economic structure. This is largely attributable to China's economic development which calls for services support that Hong Kong is well positioned to offer. Due to the opening up of China's economy and the much lower labour and land costs in China, Hong Kong's businessmen have been continuously moving their manufacturing production base across the border. This helps release manpower which is readily absorbed by the fast growing services sector.

13. A considerable proportion of value added attributable to these services activities are actually service output provided to non-resident companies or persons not residing in Hong Kong, and should thus be included in exports of services in the expenditure-based GDP. Conversely, business establishments in Hong Kong with their increasing international exposure have been importing much more services which should be included in imports of services.

14. In view of the significance of the above development, the C&SD has made special efforts since 1990 to improve the coverage of exports and imports of services in economic surveys. Previously, the survey on exports and imports of services covered only establishments which were prone to be involved in exports and imports of services activities. They included, for example, air transport operators, sea transport operators and financial and insurance companies. However, as from 1990, all establishments sampled in the Programme of Economic Surveys have been asked to provide data on exports and imports of services. This has led to a significant revision in the level of exports and imports of services.

15. The result of the enhanced coverage of trade in services is that generally the level of the expenditure-based GDP was revised upwards by about 4%. In 1993, the revised value of the expenditure-based GDP was \$888 billion while before revision it was \$851 billion. As shown in Table 1, the revision is mainly attributable to three types of exports and imports of services, namely, exports and imports of offshore trading and purchasing services; exports of land transportation services; and exports and imports of business services.

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16. Offshore trading, also known as merchanting or triangular trade, refers to international trading of goods which involves purchase and re-sale of goods without the goods physically entering and leaving Hong Kong. The economic contribution of such activities is the gross trading margin, i.e. sales receipts less cost of goods sold. Purchasing services refer to services of arranging on behalf of buyers purchase of goods according to buyers' specifications. The services include multiple sourcing, contract and price negotiation, shipment and inspection. The economic contribution of these activities is the commission earned.

17. As shown in Table 1, exports and imports of offshore trading and purchasing services contributed HK\$28 billion to value added in 1993. Thus of the 4.3% upward revision to the level of GDP, the bulk (3.1%) is attributable to this type of exports and imports of services.

Table 1 - Revision items and their net effects on expenditure-based GDP

Expenditure-based GDP at current market prices	HK\$ Million			
	1990	1991	1992	1993
(a) Expenditure-based GDP before revision	558,859	642,930	748,497	851,174
(b) Revision items and their net effects on GDP:-				
i) Exports and imports of offshore trading and purchasing services	+18,215	+19,784	+23,175	+27,931
ii) Exports of land transportation services	+3,148	+4,526	+5,673	+7,008
iii) Exports and imports of business services	+1,076	+1,302	+1,970	+2,420
iv) Miscellaneous revisions	+1,251	-30	-404	-919
Total revision	+23,690	+25,582	+30,414	+36,440
% of total revision to (a)	(+4.2%)	(+4.0%)	(+4.1%)	(+4.3%)
(c) Expenditure-based GDP after revision	582,549	668,512	778,911	887,614

18. Exports of land transportation services refers to cross border freight received by resident operators of lorries and container trucks on Hong Kong's exports to China. This is an activity emerging since the mid-1980s to support outward processing activities. In 1993, the receipts amounted to HK\$7 billion, contributing to an upward revision of 0.8% to the level of GDP.

19. Exports and imports of business services refers to legal, construction, management consultancy and other services provided by resident professional firms to non-resident companies. Again these are activities rapidly emerging to support economic activities in China. For instance, the rapid development of the real estate sector in China generates demand for construction and legal services which Hong Kong businessmen can aptly provide. Similarly, the fast growing manufacturing and hotel sectors in China require the supply from Hong Kong of management consultancy services. In 1993, exports and imports of business services contributed HK\$2 billion or an upward revision of 0.3% to GDP.

20. It is worth noting that with the enhanced coverage, exports of services achieved a value of HK\$224 billion at current prices in 1993, which exceeded the value of domestic exports in the same year at HK\$223 billion.

21. Indeed, fast expansion of trade in services has been a trend in the world economy. Because of the

increasing importance of such trade, international bodies are actively developing international guidelines on its definition and classification. A set of guidelines is included in the latest version of the System of National Accounts. The purpose is to provide a standard on the coverage and classification to be adopted in compiling trade in services statistics. The C&SD has adopted this latest standard. The statistics on trade in services for the years 1980 - 1992 are presented in Table 2.

Table 2 Exports and imports of services at current market prices by component, 1980 – 1992

HK\$ million

Year	(1) Exports of services ^a							(2) Imports of services ^a							Net ^b exports of services
	(1a) Sub-total	(1b) Transportation ^b	(1c) Travel ^c	(1d) Insurance ^d	(1e) Financial ^e	(1f) Trade- ^f related	(1g) Other ^g business	(2a) Sub-total	(2b) Transportation ^b	(2c) Travel ^c	(2d) Insurance ^d	(2e) Financial ^e	(2f) Trade- ^f related	(2g) Other ^g business	
1980	29,164	13,143	6,529	594	563	6,075	2,260	16,952	6,924	5,379	653	242	1,505	2,249	12,212
1981	35,332	16,050	8,143	573	829	7,038	2,699	21,807	8,377	6,930	598	353	1,747	3,802	13,525
1982	40,051	18,041	8,770	612	1,337	8,214	3,077	23,870	9,137	7,978	704	638	2,033	3,380	16,181
1983	46,307	20,842	11,376	749	1,856	7,903	3,581	28,253	10,652	9,794	823	848	1,971	4,165	18,054
1984	56,370	23,790	14,032	893	2,526	10,637	4,492	33,930	12,120	12,052	1,147	1,111	2,638	4,862	22,440
1985	61,050	24,548	14,999	889	2,877	12,900	4,837	37,949	12,665	14,432	1,293	1,354	3,177	5,028	23,101
1986	71,815	27,954	18,438	778	4,316	14,394	5,935	44,271	14,862	16,294	1,328	2,077	3,555	6,155	27,544
1987	92,272	34,692	26,312	1,172	5,097	17,125	7,874	52,324	16,999	19,717	1,580	2,253	4,238	7,537	39,948
1988	110,982	40,706	34,789	1,032	5,359	19,967	9,129	62,806	19,782	24,933	1,606	2,378	4,939	9,168	48,176
1989	127,147	46,675	38,742	1,104	6,590	24,250	9,786	72,173	22,360	29,401	1,813	2,679	5,982	9,938	54,974
1990	142,321	54,452	41,457	1,319	6,104	27,768	11,226	87,692	25,764	37,117	2,418	2,335	8,481	11,577	54,629
1991	161,087	64,696	42,651	1,478	7,665	31,779	12,818	100,814	27,991	43,742	2,669	2,853	10,613	12,946	60,273
1992 ⁱ	192,444	73,617	53,232	2,327	9,361	38,613	15,294	113,723	32,169	46,741	3,696	3,258	12,577	15,282	78,721

a The above classification facilitates international comparison of exports and imports of services statistics. It is developed with reference to the latest recommended classification of exports and imports of services statistics published in the Balance of Payments Manual, Fifth Edition by the International Monetary Fund in late 1993. Exports and imports of services statistics at breakdown levels more detailed than the above are not published due to large sampling error of the statistics.

b "Transportation" includes sea, air and land transport.

c "Travel" includes business and personal travel.

d "Insurance" includes direct insurance and re-insurance.

e "Financial" includes banking, financial assets dealing and brokerage services.

f "Trade-related" includes offshore trading (i.e. merchanting), purchasing services and other trade-related services.

g "Other business" includes communication, legal, construction, industrial, advertising, marketing research, management consultancy, computer, information, accounting, real estate, architectural, news transmission, production and distribution of film, hotel management services, etc.

h Net exports of services = (1a) - (2a)

i The estimates are subject to revisions later on as more data become available.

22. The new classification consists of six categories of trade in services, viz. transportation, travel, insurance, financial services, trade related services and other business services; whereas in the previous version of the System of National Accounts, only three categories of trade in services were distinguished, namely, transportation, insurance and other services. Adoption of the new classification should enhance comparability of Hong Kong's statistics on trade in services with other economies.

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Other Improvements to Expenditure-based GDP

23. Besides improvement of the coverage of trade in services, two other main improvements are made to the expenditure-based GDP.

Adopting revised deflation method for merchandise trade aggregates

24. According to the recommendation of the United Nations, real economic aggregates including merchandise trade aggregates should be derived by deflating economic aggregates at disaggregated level and then adding up deflated sub-aggregates to obtain real economic aggregates. Following this recommendation, the quantum indices for various trade aggregates are revised and the revised series is incorporated into the expenditure-based GDP.

Implementing various revisions recommended in the United Nations' latest version of the System of National Accounts

25. To ensure that GDP estimates for Hong Kong are compiled at the earliest possible time according to the latest international guidelines, all the recommendations of the United Nations' latest version of the System of National Accounts which do not require large scale data collection efforts have been implemented in the 1994 non-routine revision. These include :

- (i) publishing supplementary statistics on actual consumption, in addition to statistics on private consumption expenditure and government consumption expenditure as currently published,
- (ii) re-classifying expenditure on military equipment under Gross Domestic Fixed Capital Formation instead of Government Consumption Expenditure,
- (iii) updating statistical terms such as replacing "bank" by "depository institution", "indirect tax" by "tax on production" and "imputed output of bank services" by "output of financial intermediation services indirectly measured".

Rebasing of GDP series from 1980 to 1990

26. In this non-routine revision exercise, the expenditure-based GDP estimates for the years 1986 and thereafter are rebased at constant market prices of 1990. The base year for constant price estimates of GDP is the year in respect of which detailed price structure is used in calculating the values to provide weights for combining changes in volume of various types of goods or services produced or purchased. Although the structure of price changes only gradually from year to year, cumulative changes become significant over a number of years. It is therefore a normal practice of statistical authorities to rebase GDP estimates from time to time to ensure that the weights, or relative values, underlying the measurement of changes over any period reflect the price structure of that period reasonably closely.

Real Growth in Expenditure-based GDP

27. As a result of the above changes, the growth rates of the expenditure-based GDP at constant market prices are also revised. Table 3 compares the growth rates in the revised series with those in the previous series in recent years.

Table 3 - Comparison of revised and previously published growth rates of expenditure-based GDP at constant market prices

GDP Components		% change over preceding year in real terms			
		1990	1991	1992	1993
Private consumption expenditure	Revised	5.7	8.6	7.6	7.4
	(Previous)	(6.3)	(9.2)	(8.3)	(7.7)
Government consumption expenditure	Revised	5.5	7.7	6.8	1.5
	(Previous)	(6.0)	(6.9)	(7.1)	(0.9)
Gross domestic fixed capital formation	Revised	8.1	9.3	9.0	4.1
	(Previous)	(8.0)	(9.0)	(9.6)	(4.7)
Total exports of goods	Revised	9.6	17.3	19.8	13.5
	(Previous)	(9.2)	(16.6)	(19.2)	(13.1)
Imports of goods	Revised	11.4	19.0	22.2	12.7
	(Previous)	(11.4)	(19.0)	(22.3)	(12.8)
Exports of services	Revised	3.6	4.7	11.6	8.2
	(Previous)	(5.9)	(3.6)	(11.0)	(7.8)
Imports of services	Revised	12.1	11.3	9.1	7.8
	(Previous)	(10.7)	(8.1)	(7.0)	(6.9)
Expenditure-based GDP	Revised	3.4	5.1	6.0	5.9
	(Previous)	(3.2)	(4.1)	(5.6)	(5.6)

28. It can be seen from Table 3 that the revised growth rates at both the aggregate level and the main component level of the expenditure-based GDP do not differ significantly from the previous growth rates. Generally there is an upward revision of less than 0.5 percentage point in the growth rates at the aggregate level of GDP. The extent of upward revision becomes larger at the expenditure component level but generally does not exceed two percentage points.

Improvement Relating to Production-based GDP

29. Continuous research efforts have enabled improvement to be identified in the framework for compiling the production-based GDP. There are two major improvements, as discussed below.

Incorporating economic contributions of some commercial establishments not covered in routine economic surveys

30. In the past GDP series, the economic contributions of some commercial establishments could not be collected in a comprehensive manner via routine economic surveys. Such establishments included establishments which became operative after a lengthy period of closure; establishments which did not have employees and formal address; and establishments which did not report to the Business Registration Office of the Inland Revenue Department when they changed address. To remedy the situation, an ad hoc survey was undertaken in 1990 to ascertain whether the uncovered establishments were active. The active establishments so identified were put back into the routine economic surveys to gauge their economic contributions.

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Incorporating economic contributions of economic activities not adequately covered previously

31. In the previous GDP compilation framework, some economic activities were not adequately covered because their economic contributions could not be collected systematically through surveys. These included particularly activities relating to personal receipts of income such as tutorial fees and cash tipping in restaurants. To improve the situation, some rough estimates of the economic contributions of these activities are made with reference to some administrative data and other related survey results. They are then incorporated into the GDP estimates as appropriate.

32. Table 4 shows the results of incorporating the above improvements into the production-based GDP, which has the level at current market prices adjusted upwards by about 3%. Of this 3 percentage points upward revision, two-thirds are attributable to establishments not covered previously and the rest to economic activities not adequately covered.

Table 4 - Revision items and their effects on Production-based GDP at current market prices

	HK\$ Million		
	1990	1991	1992
(a) Production-based GDP before revision	566,484	647,314	756,225
(b) Revision items and their net effects on GDP:-			
i) Incorporating economic contributions of some commercial establishments not covered in routine economic surveys	+16,885	+14,548	+12,391
ii) Incorporating economic contributions of economic activities not adequately covered previously	+4,575	+5,028	+5,861
iii) Miscellaneous revisions	+1,116	+947	+1,217
Total revision	+22,576	+20,523	+19,469
% of total revision to (a)	(+4.0%)	(+3.2%)	(+2.6%)
(c) Production-based GDP after revision	589,060	667,837	775,694

Note: Data not yet available for 1993

Statistical Discrepancy Between Expenditure-based GDP and Production-based GDP

33. Table 5 shows the statistical discrepancies between the expenditure-based GDP and the production-based GDP, both before and after the 1994 non-routine revision. Generally speaking, the gap of discrepancy has narrowed particularly in recent years.

Table 5 - Statistical discrepancies between expenditure-based GDP and production-based GDP

<u>Year</u>	<u>Before 1994 non-routine revision</u> %	<u>After 1994 non-routine revision</u> %
1980	-2.3	-1.0
1981	-0.3	0.6
1982	-1.8	-1.3
1983	-2.0	-1.4
1984	-3.1	-2.8
1985	-2.4	-2.0
1986	-0.8	-0.4
1987	-0.2	0.7
1988	0.3	1.0
1989	0.1	0.1
1990	1.4	1.1
1991	0.7	-0.1
1992	0.9	-0.4

Note : The % figures are calculated by the following formula :

$$\frac{\text{GDP (Production)} - \text{GDP (Expenditure)}}{\text{GDP (Expenditure)}} \times 100\%$$

34. For more details of the results of the 1994 non-routine revision of the GDP, readers should refer to the report "Revised Estimates of Gross Domestic Product 1961 to First Quarter 1994" now on sale.