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Rebasing of Singapore's National Accounts to Reference Year 2005

By
Ms Yen Wai Yee, Ms Lim Yi Ding and Mr Chiou Shi Jian
Economic Accounts Division
Singapore Department of Statistics

Introduction

The Singapore Department of Statistics (DOS) has completed the rebasing of Singapore's national accounts from base year 2000 to 2005. The estimates of constant price gross domestic product (GDP) are now expressed in terms of prices prevailing in the new base year. The rebasing exercise also reconciled the three estimates of GDP, and provided the opportunity for conceptual and methodological reviews and improvements.

This article outlines the major enhancements in concepts, methodologies and data sources undertaken in this rebasing exercise. In particular, one of the more significant improvements is the estimation and allocation of implicit charges for financial services, as recommended in the United Nations System of National Accounts, 1993 and 2008 (SNA93/ SNA08). The impact of the rebasing exercise and improvements on the major national accounts aggregates is also presented.

Rebasing and Reconciliation

Constant price GDP estimates are essentially "volume" indices, which measure changes in the volume of economic activity while maintaining relative prices constant.

Consistent with international practice, DOS has been rebasing our national accounts once every five years. The updating of the base year improves our estimates of economic growth and enhances their relevance.

The reconciliation of the three measures of GDP (output, expenditure and income), which had been derived from diverse and independent data sources, in the new base year is also an integral part of the rebasing exercise. The three estimates of GDP were reconciled on the basis of the updated 2005 input-output (I-O) tables; the process cross-validated the data sources and ensured the coherence of the three separate measures of GDP.

As such, no statistical discrepancy is recorded among the different approaches of GDP for 2005. The reconciliation, methodological and data improvements have also resulted generally in lower statistical discrepancies.

Changes and Improvements

Change in Conceptual Treatment

Implicit Charges for Financial Services

DOS has adopted the SNA93/SNA08 recommendations on the measurement and allocation of implicit charges for financial intermediation services.

Financial intermediaries (FIs) may not levy explicit charges for providing financial intermediation services, which is the channelling of funds from units with surplus funds to units with demand for funds. This is carried out via a broad range of financial instruments, including loans and deposits, and debt securities.

For financial intermediation services associated with the former, FIs charge for their services indirectly by offering lower rates of interest to their depositors and levying higher rates of interest on their borrowers. Such services are also referred to as financial intermediation services indirectly measured (FISIM). For the latter, FIs charge for their services implicitly by selling debt securities at prices higher than their estimated market values. The 'implicit' nature of the service charges necessitates the use of indirect measures to estimate their values.

DOS was previously using the methodology recommended by the United Nations System of National Accounts, 1968 (SNA68), whereby implicit service charges were estimated as net interest received from loans and other investments less interest paid on deposits. In this rebasing exercise, we have adopted the recommendations of the SNA93/SNA08 to use the "reference rate"[1] approach to measure FISIM, and to measure those implicit charges associated with debt securities based on the difference between the buying (bid) or selling (ask or offer) prices for the securities and the mid-prices.

The SNA68 treated the consumption of implicit financial services as the intermediate consumption of a nominal industry, which is then deducted from GDP. In reality, implicit financial services are provided to households and government, and non-residents as well as to businesses.

The full attribution of the implicit financial services to intermediate consumption under-estimates GDP by the amount of such services provided to and consumed by households, government and non-residents. At the industry level, the value-added is over-estimated since their consumption of implicit financial services is not identified as their intermediate consumption.

1 The reference rate represents the pure cost of borrowing funds, a rate that does not include any intermediation services. The extent to which the actual interest rate paid out on deposits is lower than the reference rate represents the 'price' of the financial intermediation services, and the reverse is true for loans. Using the implicit price, FISIM on loans and deposits can then be computed.

Recognising the deficiencies in the SNA68 concept, the SNA93/SNA08 recommended the allocation of the implicit charges for financial services to final consumption by households and the government, to exports and to the intermediate consumption of the respective industries. DOS has also implemented this recommendation in this rebasing exercise.

The impact of the implementation of the revised estimation and allocation of implicit charges for financial services on Singapore's national accounts is presented in Table 1.

TABLE 1 REVISIONS TO REAL GDP GROWTH AND NOMINAL GDP LEVELS FROM IMPLEMENTATION OF REVISED METHODOLOGIES FOR IMPLICIT CHARGES FOR FINANCIAL SERVICES

Year	Revision to Nominal GDP Level (Per Cent)	Revision to Real GDP Growth (Percentage Point)
2005	2.1	0.0
2006	2.0	-0.4
2007	2.2	0.1
2008	2.0	0.1
2009	2.0	0.2

The levels of annual nominal GDP are revised upwards, by 2.0 to 2.2 per cent from 2005 to 2009. The revisions in annual real GDP growth rates are moderate, from -0.4 to 0.2 percentage point from 2006 to 2009.

In addition, with the allocation of intermediate consumption of implicit charges for financial services to the industries, FISIM is no longer shown as a separate item in the presentation of output- and income-based GDP.

Review of Classification of Government Fees and Charges

Based on the SNA93, government fees and charges are to be classified as taxes if minimal or no work is done on the part of government. However, payments that require the government to provide services (eg competence, qualification or accreditation checks) in exercising its regulatory functions should be classified as purchases of services from the government rather than payments of taxes, unless the payments are markedly out of proportion to the costs of providing the services.

A review of the classification of government fees and charges was conducted as part of this rebasing exercise. Several government fees and charges (eg driving instructors' licences, massage establishment licences, petrol storage licences and medical audit and accreditation licences) have been re-classified from taxes on production to purchases of services from the government.

The re-classification has a small impact on taxes on production and government consumption expenditure (GCE), which are revised downwards by about 1 per cent and 0.5 per cent respectively for recent years.

Change in Methodology

Rental Income

Since the 1985 rebasing of the national accounts, rental income on properties for the whole economy has been recorded as part of the value-added of the business services industry in output-based GDP, regardless of the industry classification of the lessor. Rental income was singled out then as it was relatively more prominent and distinct as a secondary activity.

However, in addition to being inconsistent with the recording of receipts from other secondary activities, this approach overstates the contribution of the business services industry.

As such, it is more appropriate to record rental income in the respective industries in output-based GDP, resulting in a downward revision in business services' share of gross value-added (GVA) and a corresponding increase in that of other industries (Table 2).

Improvement in Data Sources

Census of Construction and Census of Agriculture and Fishing

The Building and Construction Authority (BCA) conducted a Census of the Construction Industry for reference year 2005 to provide the benchmark estimate of construction value-added for the updating of the I-O tables and rebasing of the national accounts.

With the incorporation of the census results, the construction industry's value-added has been revised downwards by about $950 million in 2005, and the share of construction in GVA has been correspondingly lowered to 3.1 per cent from 3.6 per cent before rebasing.

TABLE 2 REVISIONS TO SHARE OF GVA FROM RE-CLASSIFICATION OF RENTAL INCOME, 2005

Percentage Point

	Revision to Share of Nominal GVA
Total	-
Goods Producing Industries	**0.1**
Manufacturing	0.1
Construction	0.0
Utilities	0.0
Other Goods Industries	0.0
Services Producing Industries	**-0.1**
Wholesale & Retail Trade	0.2
Transport & Storage	0.4
Hotels & Restaurants	0.1
Information & Communications	0.0
Financial Services	0.2
Business Services	-1.2
Other Services Industries	0.1
Ownership of Dwellings	**0.0**

Censuses were also conducted for the agriculture and fishing industry from 2002 to 2006. Incorporation of the data collected from these censuses has resulted in downward revisions in nominal value-added of about $60 million to $80 million every year from 2005 to 2009.

Updating of Classification

Singapore Standard Classification of Individual Consumption by Purpose (S-COICOP)

The classification of private consumption expenditure (PCE) has been updated to bring it in line with the S-COICOP (Table 3). Based on the United Nations Classification of Individual Consumption by Purpose (UN COICOP), the S-COICOP is developed for use in the classification of PCE in the national accounts, as well as the classification of goods and services in the Consumer Price Index (CPI) and Household Expenditure Survey (HES).

The common classification system will facilitate analysis of PCE, CPI and HES data, as well as enhance data sharing among producers of data, especially data on consumption, prices and expenditure.

TABLE 3 COMPARISON OF THE PREVIOUS AND NEW CLASSIFICATIONS OF PCE

	Previous Classification		**New Classification**
1	Food & Non-Alcoholic Beverages	1	Food & Non-Alcoholic Beverages
2	Alcoholic Beverages & Tobacco	2	Alcoholic Beverages & Tobacco
3	Clothing & Footwear	3	Clothing & Footwear
4	Housing & Utilities	4	Housing & Utilities
5	Furnishings, Household Equipment & Routine Household Maintenance	5	Furnishings, Household Equipment & Routine Household Maintenance
6	Health	6	Health
7	Transport	7	Transport
8	Communication	8	Communication
9	Recreation & Culture	9	Recreation & Culture
10	Education	10	Education
11	Restaurants & Hotels	11	Food Serving Services
		12	Accommodation Services
12	Miscellaneous Goods & Services	13	Miscellaneous Goods & Services

Impact on Major Macro-Economic Aggregates

The revisions arising from the rebasing exercise are not entirely due to the reconciliation of the GDP estimates and the revaluation of the national accounts to the new base year. Revisions result also from the conceptual and methodological changes introduced as well as from improvements in data sources.

Nominal GDP

The nominal GDP estimates have been revised upwards, by between 2.7 and 3.4 per cent, over the period 2005 to 2009 (Table 4). While the nominal value-added estimates for construction, utilities, agriculture and fishing, financial services, business services and ownership of dwellings have been revised downwards, this is more than offset by upward revisions in manufacturing, wholesale and retail trade, transport and storage, information and communications and other services.

GDP Growth Rates

The revisions in real GDP growth are moderate, ranging between −0.2 and 0.7 percentage points from 2005 to 2009 (Table 5). The rebased GDP series show that the decline in economic activities in 2009 was less than previously estimated.

TABLE 5 REAL GDP GROWTH

Per Cent

Year	Before Rebasing	**After Rebasing**
2005	7.6	**7.4**
2006	8.7	**8.6**
2007	8.2	**8.5**
2008	1.4	**1.8**
2009	-2.0	**-1.3**

TABLE 4 GDP AT CURRENT MARKET PRICES

Year	Before Rebasing (a)	**After Rebasing (b)**	Percentage Change [(b)-(a)]/(a)
	$ Million		Per Cent
2005	201,805.1	**208,763.7**	3.4
2006	223,315.0	**230,509.2**	3.2
2007	258,563.7	**266,405.1**	3.0
2008	266,363.1	**273,537.2**	2.7
2009	257,640.4	**265,057.9**	2.9

Composition of GDP Components

Component Share by Industry

The shares of manufacturing and wholesale & retail trade have been revised upwards, while the shares of financial services, construction and ownership of dwellings have been revised downwards (Table 6).

Component Share by Expenditure

For expenditure-based GDP, the share of net exports of goods and services has been revised upwards while that of PCE has been revised downwards (Table 7). The higher share of net exports is largely attributed to the allocation of implicit charges for financial services to exports of services.

TABLE 6 SHARE OF NOMINAL GVA BY INDUSTRY

Per Cent

	2005		2009	
	Before Rebasing	**After Rebasing**	Before Rebasing	**After Rebasing**
Total	100.0	**100.0**	100.0	**100.0**
Goods Producing Industries	30.9	**31.7**	25.9	**26.3**
Manufacturing	25.6	**26.8**	18.2	**19.5**
Construction	3.6	**3.1**	6.2	**5.4**
Utilities	1.6	**1.6**	1.4	**1.4**
Other Goods Industries	0.1	**0.1**	0.1	**0.0**
Services Producing Industries	65.6	**65.3**	68.9	**69.1**
Wholesale & Retail Trade	17.0	**17.3**	16.8	**17.7**
Transport & Storage	10.0	**10.4**	8.6	**8.8**
Hotels & Restaurants	1.9	**2.1**	1.9	**2.2**
Information & Communications	4.0	**4.0**	3.7	**3.9**
Financial Services	10.9	**10.7**	13.5	**12.2**
Business Services	11.6	**10.4**	14.3	**14.1**
Other Services Industries	10.2	**10.3**	10.0	**10.2**
Ownership of Dwellings	3.5	**3.1**	5.3	**4.6**

TABLE 7 EXPENDITURE COMPONENTS AS A PERCENTAGE OF NOMINAL GDP

Per Cent

	2005		2009	
	Before Rebasing	**After Rebasing**	Before Rebasing	**After Rebasing**
Private Consumption Expenditure	40.5	**40.1**	41.4	**40.9**
Government Consumption Expenditure	10.6	**10.5**	11.4	**11.5**
Gross Fixed Capital Formation	21.3	**21.1**	28.9	**28.7**
Changes in Inventories	-1.4	**-1.2**	-1.3	**-1.5**
Net Exports of Goods and Services	29.3	**29.4**	20.4	**21.1**
Statistical Discrepancy	-0.3	**0.0**	-0.8	**-0.6**

For PCE, although it has increased due to the allocation of implicit financial charges to final consumption, this has been more than offset by downward revisions to other PCE components arising from reconciliation with the 2005 I-O tables.

Component Share by Income

Previously, the full attribution of the consumption of implicit financial services as intermediate consumption had under-estimated gross operating surplus (GOS) by the amount of the implicit services consumed by households, the government and non-residents. With the allocation of the implicit charges to the other user sectors, the share of GOS in GDP has been revised upwards and the shares of compensation of employees and taxes less subsidies on production and on imports have been revised downwards correspondingly (Table 8).

Conclusion

The successful completion of this rebasing exercise improved the coherence of our GDP estimates and enhances their relevance to the underlying and changing economic conditions. The adoption of the SNA recommendations on FISIM and implicit service charges associated with the acquisition and disposal of debt securities improves the relevance of our GDP estimates in reflecting the use of implicit and indirectly measured services produced by FIs. This also enhances the international comparability of Singapore's national accounts as most national statistical offices in the European Union and OECD countries are already using the reference rate approach.

TABLE 8 INCOME COMPONENTS AS A PERCENTAGE OF NOMINAL GDP

Per Cent

	2005		2009	
	Before Rebasing	**After Rebasing**	Before Rebasing	**After Rebasing**
Compensation of Employees	41.6	**40.2**	45.7	**44.2**
Gross Operating Surplus	51.1	**53.6**	48.7	**50.1**
of Financial Corporations	5.6	**5.1**	8.0	**5.3**
of Non-Financial Corporations	42.3	**41.4**	37.8	**36.4**
of Others	7.7	**7.1**	9.4	**8.4**
Less: FISIM (IBSC)	4.5	**-**	6.5	**-**
Taxes less Subsidies on Production & on Imports	7.1	**6.2**	6.1	**5.6**
Statistical Discrepancy	0.2	**0.0**	-0.5	**0.1**

For more information, download a softcopy of the Information Paper on "Rebasing of Singapore's National Accounts to Reference Year 2005" from the Singstat website at

http://www.singstat.gov.sg/pubn/papers/economy/ip-e37.pdf