

Rebasing of the Singapore National Accounts to Reference Year 2000

By
Ms Ho Poh Ching, Mr Neo Poh Cheem and Mr Wong See Ngee
Economic Accounts Division
Singapore Department of Statistics

The Singapore Department of Statistics (DOS) has recently completed the rebasing of Singapore's national accounts from base year 1995 to 2000. The rebasing exercise revalues constant price or real gross domestic product (GDP) at the prices prevailing in the new base year. At the same time, it serves to reconcile the different estimates of GDP and provides the occasion for methodological and conceptual reviews and improvements.

This article outlines the major improvements to the Singapore System of National Accounts (SSNA). One notable enhancement is the adoption of the recommendation in the United Nations System of National Accounts (SNA) to capitalise software, ie to treat expenditure on software as investment (gross fixed capital formation, GFCF) instead of intermediate consumption. The impact of the rebasing on key macroeconomic 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.

Apart from the revaluation of national accounts estimates, the reconciliation of GDP estimates compiled using three independent approaches (output, expenditure and income) in the new base year 2000 is integral to the rebasing exercise. The reconciliation, which is carried out on the basis of the recently updated 2000 input-output (I-O) tables, serves to cross-validate and ensures the coherence of the three separate measures of GDP derived from diverse and independent data sources. As such, no statistical discrepancy is recorded among the different approaches of GDP estimates for 2000. The reconciliation, methodological and data improvements have also resulted generally in lower statistical discrepancies for most years.

Changes and Improvements

(A) *Change in Conceptual Treatment*

Capitalisation of Software Expenditure

DOS has adopted the SNA's recommendation to capitalise software expenditure in the national accounts. The capitalisation of software expenditure will result in the addition of computer software as an asset class in GFCF. Software expenditure is estimated to account for about 2 per cent of GFCF and about 0.5 per cent of GDP (Table 1). Its capitalisation, however, has a small impact on GDP growth, resulting in revisions of less than 0.1 percentage point to the estimated annual GDP growth rates in recent years.

TABLE 1 SHARE OF SOFTWARE INVESTMENT TO GDP AND GFCF AT CURRENT PRICES

Year	Per Cent	
	GDP	GFCF
2000	0.6	2.1
2001	0.6	2.0
2002	0.5	2.0
2003	0.5	2.0
2004	0.5	2.0

Note : Based on GDP data as at 3Q 2005.

(B) *Change in Methodology*

Wholesale and Retail Trade

The estimation of the performance and growth of the wholesale and retail trade industry has been based on trade-related proxy indicators. While these indirect indicators provide reasonable

estimates, they could not provide a basis for the dis-aggregation of the industry into wholesale trade and retail trade. With the view of facilitating the dis-aggregation in accordance with the Singapore Standard Industrial Classification (SSIC), DOS has developed the wholesale trade index (WTI), compiling it at current prices since 1997 and at constant prices since 2004. The WTI, together with the retail sales index (RSI), provide direct assessments of the performance and growth of the wholesale and retail trade.

The adoption of the WTI and RSI as the basis for our estimation, in place of the present proxy indicators based on trade statistics, has resulted in an upward revision in both the nominal value-added and real growth estimates of the wholesale and retail trade industry. In addition, the reconciliation on the basis of the 2000 I-O tables has resulted in a further upward revision in the nominal value-added estimate of the industry in the reference year. Taken together, the nominal value-added estimate of the wholesale and retail trade has been revised upwards by \$516 million and \$1.0 billion in 2000 and 2004 respectively.

(C) *Improvement in Data Sources*

Census of Construction

The Building and Construction Authority (BCA) conducted a Census of the Construction Industry for reference year 2000 to provide benchmark estimates of construction value-added for the updating of I-O tables and rebasing of the national accounts. The incorporation of the census results has resulted in a downward revision of the construction industry's value-added by about \$900 million in 2000. Correspondingly, the share of construction in Gross Value-Added (GVA) has declined from 6.3 per cent (before rebasing) to 5.7 per cent (after rebasing) in 2000.

(D) Revision of Data Sources

Ownership of Dwellings¹

The SNA treats owner-occupiers as household unincorporated enterprises that produce housing services for their own consumption, including their value-added in GDP. The output of these owner-occupied residential buildings is imputed from their annual assessed values based on data provided by the Housing and Development Board (HDB) and Inland Revenue Authority of Singapore (IRAS) Property Tax Division.

In 2004, IRAS conducted a re-assessment of the annual values of HDB flats to ensure that the assessed values are more in line with the market. The output of owner-occupied dwellings has been revised accordingly to reflect more accurately the value-added from the housing services provided. This resulted in an upward revision of the GVA of ownership of dwellings by \$1.4 billion, to \$6.7 billion in 2000. Correspondingly, its share in GVA has increased from 3.4 per cent to 4.3 per cent in the same year.

(E) Updating of Classification

Private Consumption Expenditure (PCE)

The previous classification of private consumption expenditure (PCE) by purpose, which was based on the earlier 1968 SNA, has been updated to bring it in line with the 1993 SNA's recommended Classification of Individual Consumption by Purpose (COICOP). The updated classification (Table 2) provides for the classification of more purposes (eg by its separate identification of the fast-growing communications segment), and re-classifies some PCE components.

Being broadly consistent with the classifications adopted by the OECD countries, the updating of the PCE classification will enhance the international comparability of the PCE components in our national accounts. The updating of the PCE classification, however, has no impact on the level and growth rate of overall PCE estimates.

TABLE 2 COMPARISON OF THE PREVIOUS AND EXISTING CLASSIFICATION OF PCE

Previous Classification		Existing Classification	
1	Food & Beverages	1	Food & Non-Alcoholic Beverages
		2	Alcoholic Beverages & Tobacco
2	Clothing & Footwear	3	Clothing & Footwear
3	Rent & Utilities	4	Housing & Utilities
4	Furniture & Household Equipment	5	Furnishings, Household Equipment & Maintenance
5	Medical Services	6	Health
6	Transport & Communication	7	Transport
		8	Communication
7	Recreation & Education	9	Recreation & Culture
		10	Education
8	Other Goods & Services	11	Restaurants & Hotels
		12	Miscellaneous Goods & Services

¹ Previously known as "owner-occupied dwellings". As the data series also includes residential buildings which are let out by individuals (eg those who owned more than one dwelling), the term "ownership of dwellings" reflects more appropriately the inclusion of both the imputed and rented component.

Impact of Rebasing (As At 3rd Quarter 2005)

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 arise also from the methodological and conceptual changes introduced as well as the improvements in data coverage and data sources.

TABLE 3 REAL GDP GROWTH

Year	Per Cent	
	Before Rebasing	After Rebasing
2000	9.6	10.0
2001	-2.0	-2.2
2002	3.2	3.9
2003	1.4	2.2
2004	8.4	8.8

Note : Based on GDP data as at 3Q 2005.

(A) GDP Growth Rates

The revisions in real GDP growth have been relatively moderate, ranging between -0.2 and 0.8 percentage points from 2000 to 2004 (Table 3). Generally, upward revisions in the contributions to growth from manufacturing, construction, wholesale and retail trade, and business services are partially offset by downward revisions in contributions from transport and communications.

(B) Nominal GDP

The revisions in nominal GDP estimates are relatively moderate, ranging between -0.3 and 0.9 per cent from 2000 to 2004 (Table 4), as the upward revisions in nominal value-added estimates for wholesale and retail trade, transport and communications, business services and ownership of dwellings are offset by downward revisions for manufacturing, construction, financial services and other services.

TABLE 4 GDP AT CURRENT MARKET PRICES

Year	Before Rebasing	After Rebasing	Percentage Change [(b) - (a)] / (a)
	(a)	(b)	
\$ Million			
2000	159,595.9	159,840.4	0.2
2001	153,771.4	153,367.8	-0.3
2002	158,387.7	157,853.7	-0.3
2003	160,923.6	160,642.1	-0.2
2004	180,554.4	182,112.7	0.9

Note : Based on GDP data as at 3Q 2005.

(C) Composition of GDP Components

Component Share by Industry

In general, the shares of manufacturing and construction in GVA have been revised downwards, while the shares of wholesale and

retail trade, transport and communications, and ownership of dwellings have been revised upwards (Table 5).

TABLE 5 SHARE OF NOMINAL GROSS VALUE-ADDED BY INDUSTRY

	Per Cent			
	2000		2004	
	Before Rebasing	After Rebasing	Before Rebasing	After Rebasing
Total	100.0	100.0	100.0	100.0
Goods Producing Industries	34.6	33.6	33.8	32.9
Manufacturing	26.6	26.2	27.7	27.2
Construction	6.3	5.7	4.3	3.8
Utilities	1.5	1.6	1.7	1.7
Other Goods Industries	0.1	0.1	0.1	0.1
Services Producing Industries	62.0	62.1	63.0	63.4
Wholesale & Retail Trade	12.7	13.0	14.3	14.7
Hotels & Restaurants	2.2	2.2	2.0	1.9
Transport & Communications	11.7	11.7	11.0	11.5
Financial Services	11.3	10.9	11.3	11.1
Business Services	13.7	13.9	12.7	12.7
Other Services Industries	10.4	10.4	11.7	11.5
Ownership of Dwellings	3.4	4.3	3.2	3.8

Note : Based on GDP data as at 3Q 2005.

Component Share by Expenditure

For expenditure-based GDP, while the share of net exports of goods and services has been revised downwards, the share of PCE has been revised upwards (Table 6). The lower share of net exports could be attributed to the revisions of data on goods for processing, repairs and merchanting as well as the incorporation of new data sources and improvements to existing data sources. The higher share in PCE reflects the revisions in estimates on the ownership of dwellings arising from the re-assessment of the annual values of HDB flats.

Conclusion

The successful completion of this rebasing exercise ensures the continuing coherence and reliability of our GDP estimates and enhances their relevance to the underlying and changing economic conditions. The capitalisation of software expenditure, together with the enhancements in the concepts, methodologies and data sources, has further strengthened our existing statistical framework that underpins the compilation of national accounts and ensures its conformity to international standards and practices.

TABLE 6 FINAL DEMAND AS A PERCENTAGE OF NOMINAL GDP

	Per Cent			
	2000		2004	
	Before Rebasing	After Rebasing	Before Rebasing	After Rebasing
Private Consumption Expenditure	40.9	42.2	42.2	42.5
Government Consumption Expenditure	10.9	10.8	10.6	10.5
Gross Fixed Capital Formation	29.8	30.6	24.0	23.6
Changes in Inventories	2.7	2.7	-5.7	-4.0
Net Exports of Goods and Services	14.9	13.6	29.7	27.3
Statistical Discrepancy	0.8	0.0	-0.9	0.2

Note : Based on GDP data as at 3Q 2005.