Rebasing of the Singapore National Accounts to Reference Year 1995

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Introduction

The Singapore Department of Statistics (DOS) has recently completed the rebasing of the Singapore System of National Accounts (SSNA) to reference year 1995. The estimates of production and expenditure on the Gross Domestic Product (GDP) at constant prices will consequently be expressed in terms of prices prevailing in 1995, instead of prices prevailing in 1990.

The rebasing exercise not only revalues GDP on the basis of prices prevailing at the new base year, but also serves to reconcile the different estimates of GDP and provides the occasion for methodological and conceptual reviews and improvements. The rebased GDP series has been adopted as the basis for reporting GDP growth rates with effect from the Annual Economic Survey of Singapore 2002.

This article outlines and explains the various methodological changes and improvements, in particular, the adoption of basic price in the valuation of output. Their consequent impact on real GDP estimates is also presented.

Change in Valuation of Output

Three different prices for the valuation of output are defined in the United Nations (UN) 1993 System of National Accounts (SNA93) as follows :

(a) Basic price is "the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer." (SNA93, para 6.205a)

(b) Producer's price is "the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any value-added tax (VAT) or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer." (SNA93 para 6.205b)

(c) Purchaser's price is "the amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place." (SNA93 para 6.215)

The relationship between them can be given as follows :

	Purchaser's Price
Minus	Trade and Transport Margins
Equals	**Producer's Price**
Minus	Taxes on Products (Sales Tax, Manufacturers' Excise Tax, and/or Non-Deductible VAT)
Plus	Subsidies on Products
Equals	**Basic Price**

The difference between basic price and producer's price is the inclusion of excise, sales and other similar taxes on products in the latter. Intermediate consumption is always valued at purchaser's price. Since gross value-added (GVA) is output less intermediate consumption, the different prices will yield two different measures of GVA depending on whether basic price or producer's prices is used to value output.

In a world without taxes and subsidies, these different prices would not arise. Further, in the absence of a VAT such as GST or other deductible taxes, producer's price is equivalent to market price, which is the amount of money willing buyers pay to acquire something from willing sellers. However, this is no longer the case once VAT is introduced since "in the presence of VAT, the producer's price excludes invoiced VAT, and it would be inappropriate to describe this measure as market prices" (SNA93 para 6.227).

Singapore, like many other countries, has been compiling and publishing GVA by industry at producer's price. The change in tax regime following the introduction of GST in 1994 has made this no longer appropriate, making it necessary to shift to basic price. Basic price is, in fact, the "preferred method of valuation, especially when a system of VAT or similar deductible tax is in operation" (SNA93 para 6.218).

The re-compilation of GVA at basic price will remove the impact or effect of taxes (subsidies) on products. As these tend to fall mainly on a few industries, the relative share of GVA (or GDP) by industry will be more correctly reflected. In addition, as most OECD countries (eg Australia, UK, Netherlands) compile GVA at basic price, the adoption of basic price as the basis of valuation will enhance the international comparability of Singapore's estimates of GVA and labour productivity (value-added per worker) by industry (Table 1).

TABLE 1 VALUATION OF VALUE-ADDED

Country	VAT	Valuation of Value-Added	
		Basic Price	Producer's Price
Australia	✓	✓	
Canada	✓	✓	
Norway	✓	✓	
The Netherlands	✓	✓	
United Kingdom	✓	✓	
Japan	✓		✓
South Korea	✓		✓
Hong Kong	x		✓
Malaysia	x*		✓
United States	x*		✓

* Sales Tax

Taxes on products are payable on goods and services when they are produced, delivered, sold, transferred or otherwise disposed of by their producers. They include taxes and duties on imports, goods and services tax and other taxes on products, eg excise duties, COE/ARF, betting and sweepstake duties, hotel cess etc.

Table 2 shows the breakdown of these taxes in reference year 1995 and in 2001. The most significant of these taxes is COEs/ARFs, which amounted to $3.5 billion in 2001, imposed on the sale of cars and attributed to the wholesale and retail sector.

TABLE 2 TAXES ON PRODUCTS, 1995 AND 2001

$ Million

	1995	2001
Taxes on Products	**8,394.5**	**9,947.0**
Of which :		
Taxes & Duties on Imports	751.9	1,105.3
Goods & Services Tax	1,647.4	2,013.0
Other Taxes on Products	5,995.2	6,828.7
Excise Duties (include Tax on Petroleum, Tobacco, Liquor, etc)	837.6	734.7
COE/ARF	3,090.4	3,548.7
Betting, Sweepstakes & Lottery Duties	981.6	1,573.5
Stamp Duties	990.7	757.3
Others	94.9	214.5

Impact on Major Economic Aggregates

The adoption of basic price in the compilation of GVA has resulted in significant changes in the industrial distribution (Table 3) with significant decline in the share of wholesale and retail trade. The relative shares of manufacturing, transport and communications, and business services have shown corresponding increases.

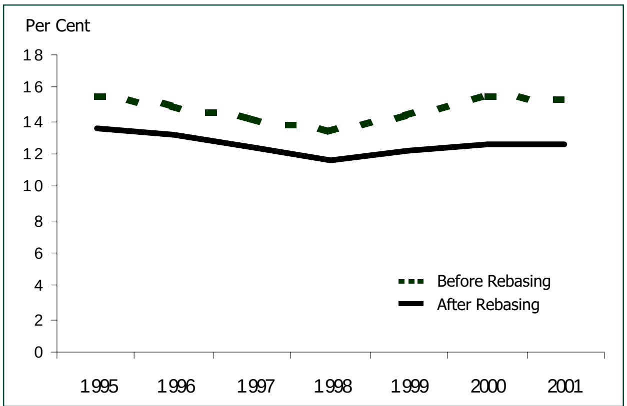
TABLE 3 SHARE OF NOMINAL GROSS VALUE-ADDED BY INDUSTRY

Per Cent

	1995		2001	
	Before Rebasing	**After Rebasing**	Before Rebasing	**After Rebasing**
Total	100.0	**100.0**	100.0	**100.0**
Goods Producing Industries	32.4	**33.9**	30.1	**31.1**
Manufacturing	23.9	**25.0**	22.3	**23.1**
Construction	6.8	**7.1**	5.8	**6.1**
Utilities	1.5	**1.5**	1.8	**1.8**
Other Goods Industries	0.2	**0.2**	0.1	**0.1**
Services Producing Industries	64.2	**62.6**	66.4	**65.2**
Wholesale & Retail Trade	15.4	**13.5**	15.2	**12.6**
Hotels & Restaurants	2.9	**2.7**	2.6	**2.4**
Transport & Communications	11.6	**12.1**	10.6	**11.2**
Financial Services	11.3	**11.1**	12.4	**12.9**
Business Services	12.8	**13.4**	13.7	**14.7**
Other Services Industries	10.2	**9.8**	11.9	**11.4**
Owner-Occupied Dwellings	3.4	**3.5**	3.5	**3.6**

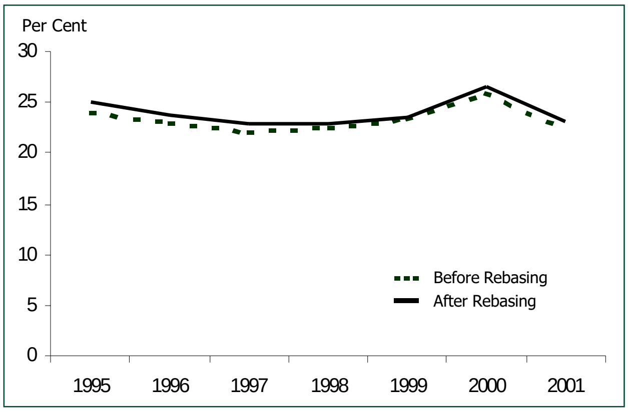
The share of wholesale and retail trade in GVA declined from 15.4 per cent to 13.5 per cent in reference year 1995, and from 15.2 per cent to 12.6 per cent in 2001 (Chart 1). The change is due to the fact that GVA of wholesale and retail trade would have included COE/ARF and other taxes on products at producer's price, but not at basic price.

CHART 1 CHANGES IN SHARE OF WHOLESALE AND RETAIL TRADE IN NOMINAL GVA



The increase in the relative share of manufacturing from 23.9 per cent (before rebasing) to 25 per cent (after rebasing) in 1995 (Chart 2) was due not just to change in the basis of valuation. Part of the increase could be attributed to the under-coverage of smaller manufacturing establishments identified through commodity balancing as part of the reconciliation exercise with the 1995 input-output tables.

CHART 2 CHANGES IN SHARE OF MANUFACTURING IN NOMINAL GVA



The changes in the annual growth rates have been relatively moderate, with real GDP growth in the rebased series lower for the most recent years 1998 to 2001 (Table 4). This is consistent with the observations of many statistical offices that real GDP growth estimates are more likely to be revised downward when the base year is updated to a more recent period. This is because goods that grow more rapidly tend to be over-weighted as their prices are usually falling at a faster rate.

TABLE 4 ANNUAL REAL GDP GROWTH

Per Cent

	Before Rebasing	After Rebasing
1995	8.0	8.0
1996	7.7	8.3
1997	8.5	8.5
1998	–0.1	–0.8
1999	6.9	6.4
2000	10.3	9.9
2001	–2.0	–2.1

Other Methodological Revisions and Improvements

The close and careful examination of data sources and methodology undertaken during the rebasing exercise also provides the occasion for several improvements and non-routine revisions, including updating and revisions to national accounting concepts. These improvements, revisions and updating serve to ensure that our national accounts estimates better reflect the underlying economic reality.

(a) Methodological Revisions

Value-added of Financial Services

To ensure that the methodology used to assess the growth and performance of financial services continues to provide accurate, relevant and timely estimates, DOS undertook with the Monetary Authority of Singapore (MAS) in 1997, a comprehensive review of the methodology used to estimate the value-added of financial services.

The review resulted in the adoption of more output-based measures such as fees and commissions received in place of traditional input-based measures such as employment. Changes in actuarial reserves were included in the assessment of the output of insurance services, consistent with industry practices as well as with the SNA93. These changes and revisions were introduced and explained in an information paper 'Value-added of Financial Services: Revision in Methodology and Estimates' released in July 1999.

(b) Review of Conceptual Treatment

Royalties

SNA93 recommends the re-classification of royalties paid and received from factor income to payments/receipts for services. The re-classification would result in the inclusion of royalties as intermediate consumption (for business establishments who pay royalties) or output (for business establishments who receive royalties). This recommendation was adopted by DOS with effect from the 1999 Annual Economic Survey of Singapore. In general, nominal GDP was lowered as Singapore-based establishments paid more royalties than they received it.

Computer Software

SNA93 has recommended that computer software which are used in the production of goods and services for more than one year are to be treated as investment instead of intermediate consumption. The adoption of this would have the impact of increasing estimates of gross fixed capital formation and hence raise the level of GDP. With the view to adopting this recommendation, DOS has since 1999 introduced modifications to the various annual surveys to collect information on the expenditure on software.

DOS is presently reviewing and assessing the quality of the data collected as well as the practices and experiences of countries that have implemented this recommendation. DOS will also work with the Infocomm Development Authority of Singapore (IDA) to identify appropriate monthly or quarterly indicators for deriving timely and reliable quarterly estimates of software expenditure.

(c) Changes in Industrial Classification

Singapore Standard Industrial Classification (SSIC)

In 1999, DOS adopted a new reporting format for output-based GDP estimates when implementing the SSIC 1996 in the national accounts. This new format provides explicit recognition of the increasing importance of services through the separate identification of goods and services producing industries.

More detailed estimates of GDP by industry are also provided through the decomposition of GDP into nine major economic sectors instead of the previous five. The details of this new reporting format are provided in an information paper 'Implementation of SSIC 1996 in the National Accounts (New Reporting Format for Output-based GDP)' released in September 1999.

In the latest rebasing exercise, the industrial classification used for output-based GDP is further updated to SSIC 2000. The general structure of SSIC 2000 is essentially similar to SSIC 1996 and no change in reporting format is necessary.

The adoption of SSIC 2000 ensures that new and emerging economic activities such as the development of e-commerce applications, software and multimedia works and the research experimental development on life sciences are captured. The shift in economic activities across economic sectors will also be reflected under the new classification, eg establishments which engage in publishing activities (without doing their own printing) are transferred from the manufacturing sector to the business sector.

(d) Improvements in Coverage and Data Sources

Survey of International Trade in Services (TIS)

The balance of payments (BOP) accounts are closely related to the national accounts not only in theory but also in practice. In the case of the Singapore System of National Accounts, the relationship is reinforced by the fact that estimates for the BOP are subsequently incorporated in the relevant external components of the national accounts. Along with this rebasing exercise, the BOP estimates and these components have been updated to incorporate the results of the Survey of Trade in Services (TIS) from reference year 1995 onward.

(e) Updating/Changes in Terminology

Gross National Income

Unlike GDP which measures the production of goods and services within an economy, Gross National Product (GNP) measures the income receivable by the resident institutional units of an economy. To emphasize that GNP is an income-based concept, SNA93 recommended that it be renamed Gross National Income (GNI). DOS has adopted this recommendation, and will use the term GNI instead of GNP.

Resident Institutional Unit

An institutional unit is an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities.

An institutional unit is resident in a country when it has a centre of economic interest in the economic territory of that country.

Financial Intermediation Services Indirectly Measured (FISIM)

SNA93 also recommends that imputed bank service charge (IBSC) be re-termed as FISIM. It further recommends the allocation of FISIM among the different users in the various industries. This differs from its predecessor, the 1968 System of National Accounts (SNA68), where it is treated as the intermediate consumption of a nominal industry.

DOS has re-termed IBSC as FISIM. In addition, DOS will work closely with the Monetary Authority of Singapore (MAS) to develop the necessary data sources and methodology to allocate FISIM across the different industries as recommended. The allocation of FISIM will raise the level of GDP, and is likely to result in an increase in the financial sector's share of GDP. Since the relative size of FISIM varies across economies, the allocation of FISIM will enhance further the international comparability of our GDP estimates.

Conclusion

The successful completion of the rebasing of the national accounts, including the reconciliation of the various national accounts estimates and the continuing methodological and conceptual improvements introduced in the last few years, ensure that our national accounts continue to provide reliable, accurate and timely economic statistics. They also ensure that our methodology and practices conform to international standards and practice.