

Benchmarking of Singapore's National Accounts to Reference Year 2015

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Introduction

The Singapore Department of Statistics (DOS) recently completed the benchmarking of Singapore's national accounts from reference year 2010 to 2015, incorporating conceptual and methodological reviews and improvements for better reflection of the current economic landscape.

This exercise also reconciled the three estimates of Gross Domestic Product (GDP) from the production, expenditure and income approaches, cross-validating the data sources and ensuring the coherence of the three separate measures. As such, no statistical discrepancy is recorded among the different approaches of GDP for 2015.

This article highlights the major enhancements in concepts and methodologies undertaken in this benchmarking exercise. One significant improvement is the adoption of the recommendation of the United Nations System of National Accounts (SNA) to compile annually reweighted chain volume measures (CVM) of GDP. The impact of the benchmarking exercise on key national accounts aggregates is also presented.

Real Gross Domestic Product

Constant price or real GDP estimates, are volume indices which measure changes in the volume of economic activity while maintaining constant relative prices. However, as prices of goods and services change over the years, the relative price weights of a particular year become less representative. Hence, the relative price weights will have to be periodically updated to a more recent year.

Following the SNA recommendations, DOS implemented the CVM of GDP from the 1st Quarter 2019 results reported in the Economic Survey of Singapore.

Changes and Improvements in Conceptual Treatment and Methodologies

Annual Chain-linking

DOS now compiles annually reweighted CVM of GDP where real GDP estimates are expressed in terms of previous years' prices. Compared to the five-yearly reweighted volume measures of GDP compiled previously, the CVM of GDP better reflect prevailing economic conditions.

The implementation of the CVM requires the use of previous years' weights, compiled using data from various annual and quarterly surveys or administrative data. These weights will be updated annually during the annual Economic Survey of Singapore. This approach allows for a timely annual update of the weights used and ensures that the CVM compiled are reflective of the current economic landscape.

Revisions to annual real GDP growth in previous years as a direct consequence of the adoption of annual chain-linking are moderate, ranging from -0.3 to 0.2 percentage points between 2015 and 2018.

The implementation of annual chain-linking aligns Singapore's national accounting practices with those of other economies, such as Australia, Hong Kong, Canada and the United States, and improves the international comparability of Singapore's GDP estimates.

Goods for Processing

Goods for processing refer to goods that are sent for processing overseas, with the processing activity undertaken by an entity that does not own the goods concerned.

According to the International Monetary Fund's Balance of Payments and International Investment Position Manual (BPM) and the SNA, the physical movement of goods across national borders for a processing activity without a change in ownership is not considered as an import or export of these goods.

Hence, while the goods account of the balance of payments (BOP) cover goods transacted between residents and non-residents, goods sent abroad or received from abroad for processing with no change in ownership between residents and non-residents should not be recorded as exports and imports.

In accordance with the BPM and SNA, the goods account has been adjusted to reflect the inward and outward processing arrangements of goods. Such adjustments have been incorporated into gross exports and imports as well as net exports of goods, improving the treatment and coverage of the BOP and national accounts.

Insurance Service Charge

The output of an insurance company is estimated based on the sum of insurance premiums and investment income less claims.

During periods in which insurers face exceptionally large or volatile claims, the estimation of insurance output could be extremely volatile and may even be negative.

The "expectations approach" in the measurement of insurance output was implemented, taking guidance from the United Nations Statistics Division and the European Central Bank.

This provides a stable measure of insurance output and addresses the issue of having volatile and negative estimates of output arising from unforeseen large claims.

Impact on Major Macro-Economic Aggregates

Other than the reconciliation of the GDP estimates, the revaluation of the national accounts and adoption of CVM, revisions also resulted from the conceptual changes and methodological improvements introduced during the benchmarking exercise.

The impact of these revisions on major macro-economic aggregates are examined below.

GDP Growth Rates

Revisions to real GDP growth are moderate, ranging between -0.2 and 0.4 percentage points from 2015 to 2018 (Table 1).

The revisions vary across industries. The Wholesale and Retail Trade industry recorded slightly higher revisions in annual growth rates, compared to other industries.

TABLE 1
REAL GDP GROWTH, 2015-2018

Year	Before	After	Per Cent
	Benchmarking (a)	Benchmarking (b)	Change (b)-(a)
	Per Cent		Percentage Point
2015	2.5	2.9	0.4
2016	2.8	3.0	0.2
2017	3.9	3.7	-0.2
2018	3.2	3.1	-0.1

Nominal GDP

From 2015 to 2018, nominal GDP levels, or GDP at current market prices, revised 0.5 to 0.8 per cent upwards (Table 2).

TABLE 2
GDP AT CURRENT MARKET PRICES, 2015-2018

Year	Before	After	Per Cent
	Benchmarking (a)	Benchmarking (b)	Change [(b)-(a)]/(a)
	\$ Million		Per Cent
2015	421,046.3	423,444.1	0.6
2016	437,339.1	439,411.6	0.5
2017	464,928.3	467,305.5	0.5
2018	487,087.5	491,174.5	0.8

Among the industries, while the nominal gross value-added (GVA) estimates for Manufacturing, Information & Communications, Finance & Insurance, and Business Services were revised upwards, these were partially

partially offset by the downward revisions of the estimates for the Construction, Wholesale & Retail Trade, Transportation & Storage, as well as Other Services Industries.

Composition of GDP Components

Component Share by Industry

The relative GVA shares of industries were also updated during the benchmarking exercise. The GVA shares of the Manufacturing and Finance & Insurance

industries were revised upwards, while the GVA shares of Construction, Transportation & Storage, and Other Services Industries were revised downwards (Table 3).

Component Share by Expenditure

The relative share of private consumption expenditure in expenditure-based GDP estimates was revised upwards, while that of gross fixed capital formation was revised downwards (Table 4).

TABLE 3
NOMINAL GVA SHARE BY INDUSTRY, 2015 AND 2018

	2015		2018	
	Before Benchmarking	After Benchmarking	Before Benchmarking	After Benchmarking
Total	100.0%	100.0%	100.0%	100.0%
Goods Producing Industries	25.6%	25.8%	26.1%	26.7%
Manufacturing	19.0%	19.2%	21.4%	22.0%
Construction	5.2%	5.1%	3.5%	3.4%
Utilities	1.5%	1.5%	1.2%	1.2%
Services Producing Industries	70.0%	69.7%	70.4%	69.6%
Wholesale & Retail Trade	16.6%	16.4%	18.0%	17.6%
Transportation & Storage	7.6%	7.5%	6.9%	6.7%
Accommodation & Food Services	2.2%	2.2%	2.1%	2.1%
Information & Communications	4.0%	4.0%	4.1%	4.1%
Finance & Insurance	12.4%	12.5%	12.9%	13.0%
Business Services	15.9%	15.8%	14.9%	14.9%
Other Services Industries	11.4%	11.3%	11.5%	11.3%
Ownership of Dwellings	4.3%	4.5%	3.5%	3.7%

TABLE 4
EXPENDITURE COMPONENTS AS A PERCENTAGE OF NOMINAL GDP, 2015 AND 2018

	2015		2018	
	Before Benchmarking	After Benchmarking	Before Benchmarking	After Benchmarking
Private Consumption Expenditure	36.4%	37.2%	34.8%	35.4%
Government Consumption Expenditure	10.3%	10.2%	10.9%	10.7%
Gross Fixed Capital Formation	27.3%	27.2%	25.0%	24.5%
Changes in Inventories	-1.0%	-1.9%	2.6%	2.5%
Net Exports of Goods & Services	27.0%	27.3%	26.7%	26.9%

Note: Figures are expressed as a share of expenditure-based GDP.

Component Share by Income

The relative share of compensation of employees in the current price income-based GDP estimates was revised downwards (Table 5). Correspondingly, the relative share of gross operating surplus increased.

Conclusion

The successful completion of the benchmarking exercise improves the coherence and reliability of

Singapore's GDP estimates, enhancing their relevance to the underlying and changing economic conditions.

In addition, the international comparability of Singapore's GDP estimates has been enhanced with the adoption of the SNA recommendation to compile CVM of GDP, and the continuous improvements in methodologies and data sources.

TABLE 5
INCOME COMPONENTS AS A PERCENTAGE OF NOMINAL GDP, 2015 AND 2018

	2015		2018	
	Before Benchmarking	After Benchmarking	Before Benchmarking	After Benchmarking
Compensation of Employees	42.2%	42.0%	39.8%	39.7%
Gross Operating Surplus	50.3%	50.6%	53.0%	53.1%
Taxes less subsidies on Production & on Imports	7.5%	7.4%	7.2%	7.2%

Note: Figures are expressed as a share of income-based GDP.

Download the Information Paper
[Benchmarking of Singapore's National Accounts to Reference Year 2015](#)
for more information!



Watch the introductory [video](#) on the chain-linking of real Gross Domestic Product (GDP) and the chain volume measures (CVM)!

