

QUEENSLAND TREASURY

Queensland State Accounts – overview

An overview of the methodology and data used to compile quarterly Queensland State Accounts.

Economic Strategy Division

Queensland Treasury

<http://www.qgso.qld.gov.au>

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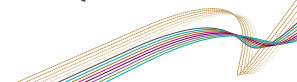
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Methodological approach

Introduction and overview

The Australian Bureau of Statistics (ABS) publishes a complete set of economic accounts at a national level on a quarterly basis, i.e. gross domestic product (GDP) in *Australian National Accounts, National Income, Expenditure and Product* (5206.0). However, the ABS only publishes a complete set of economic accounts at a state level, i.e. gross state product (GSP), annually in *Australian National Accounts: State Accounts* (ABS 5220.0).

On a quarterly basis, the ABS publishes an estimate of Queensland's state final demand (SFD). However, SFD is only a partial indicator of Queensland's economic growth as it captures only the domestic component of the State's economic activity.

In order to provide a more comprehensive and timely set of Queensland economic accounts (including GSP), Queensland Treasury compiles the *Queensland State Accounts* (QSA) on a quarterly basis. The first issue of the QSA was published in December 1993, with quarterly QSA data on a time series basis from September quarter 1985.

The QSA extends and supplements the quarterly ABS data to include more comprehensive measures of the State's trade sector, including interstate trade and overseas services trade.

The QSA provide policymakers and other key stakeholders with a greater insight into Queensland's overall economic performance and also allow a more timely comparison of that performance with the rest of Australia. Queensland is the only state to produce quarterly economic accounts.

Defining gross state product

GDP is the standard measure used to assess and compare the economic performance of countries or regions. GDP is an aggregate measure of the total economic production of goods and services, including trade, in a country within a period of time. Comparisons of GDP between time periods provide a comprehensive measure of economic growth.

At the State level, the equivalent of the national measure of GDP is GSP, the aggregate measure which details the total economic production of a state's economy.

The ABS produces annual estimates of GSP for the states and territories, while Queensland Treasury produces quarterly estimates of GSP for Queensland and rest of Australia. Rest of Australia estimates are derived by subtracting the Queensland QSA estimates from the corresponding national estimates of GDP produced by the ABS.

State final demand and gross state product

As noted earlier, the ABS produces estimates of SFD at the state level on a quarterly basis. SFD is a measure of domestic economic activity, as domestic final demand is at the national level. SFD is defined as the value of the final use (consumption or investment) of goods and services within a given period by households, governments and businesses.

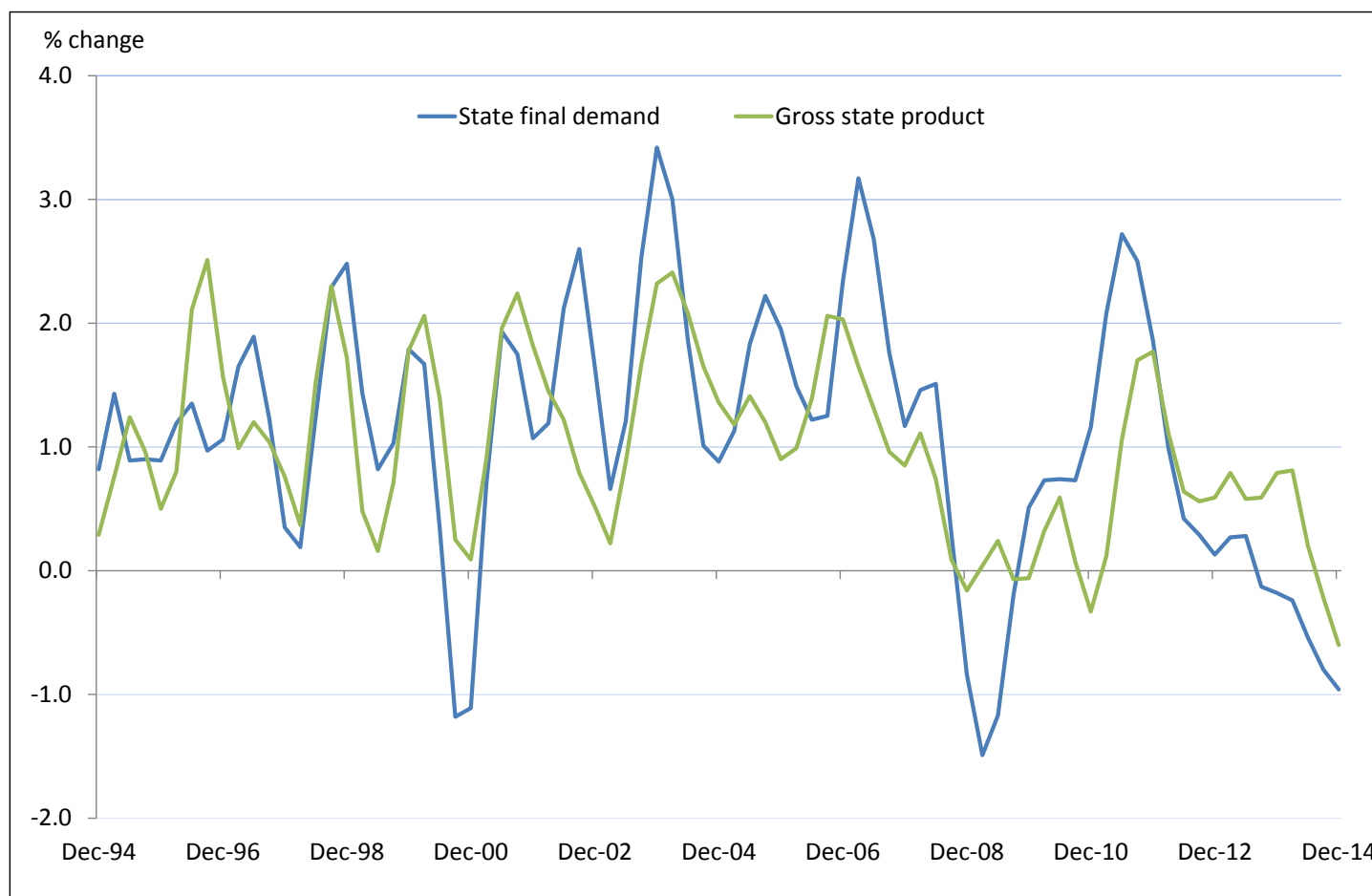
Consumption comprises both household and government final consumption of goods and services, while investment comprises private and public gross fixed capital formation.

Measures of SFD make no distinction between demand that is met by goods and services produced within the state in question, or by supplies sourced from another state, or from overseas. Therefore, SFD is not a measure of the value of production activity occurring within a state and is only a partial measure of economic activity, as it excludes the contribution of both international and interstate trade in goods and services, as well as changes in inventories¹.

Given that SFD does not capture the impact of both interstate and overseas trade, it provides a significantly different measure of economic activity than GSP, particularly for states with significant trade sectors. Figure 1 below demonstrates the difference in quarterly growth of SFD, compared with GSP, for Queensland over the last two decades.

¹ Changes in inventories are the difference in value between inventories held at the beginning and end of the reference period by enterprises and general government. For national accounting purposes, physical changes in inventories should be valued at the prices current at the times when the changes occur.

Figure 1: State final demand and gross state product, trend, quarterly % change



Source: ABS 5206.0 and QSA

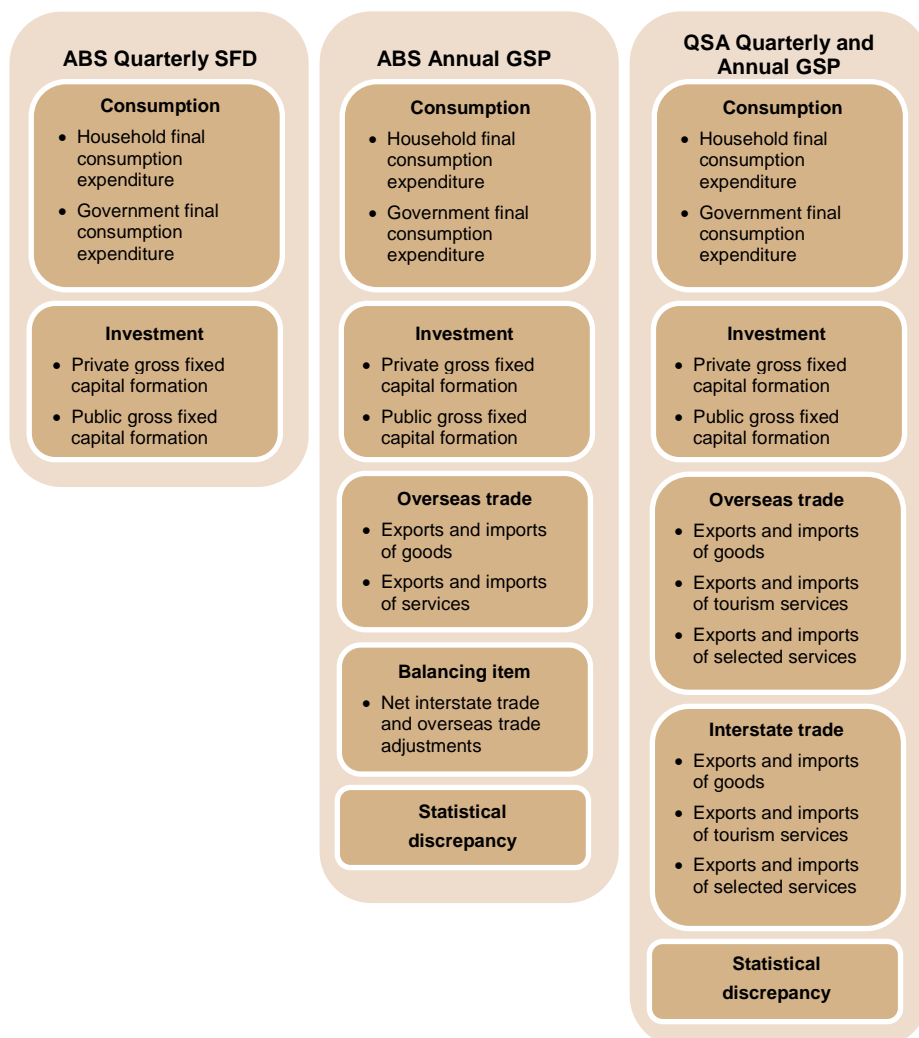
In addition, the ABS publishes quarterly details of international merchandise trade in *Balance of Payments and International Investment Position, Australia* (5302.0).

Comparison of ABS and QSA economic accounts

As discussed above, compilation of the QSA enhances the understanding of the performance of the Queensland economy on a quarterly and annual basis. In particular, Queensland Treasury closely examines the relevant ABS estimates for each key component of the Queensland economy and, where appropriate, enhances the estimates to reflect specific additional state-level data and information that provides a more detailed understanding of economic activity in the State.

Figure 2 below highlights the additional level of detail provided in the QSA, compared with the quarterly and annual state accounts produced by the ABS.

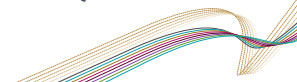
Figure 2: Comparison of components of published estimates of State economic accounts



The key enhancements in the QSA include:

- Consumption – incorporating additional state-based tourism data and more timely Queensland Government public finance data.
- Public investment – including, where available, more up to date information on Queensland general government and government owned corporations investment.
- Overseas exports of goods – including available Queensland re-exports data and specific data related to key commodities included in the ABS 'State not available' series.
- Overseas imports of goods – incorporating Queensland estimates of civil aircraft imports, as well as balance of payment adjustments for capital goods and low value threshold (LVT) imports.
- Overseas trade in services – including estimates based on a range of ABS and Tourism Research Australia (TRA) data.
- Interstate trade – including estimates based on various data sources, including the ABS Queensland Interstate Trade Survey and domestic tourism data from TRA.

More detailed discussion of the key components of the QSA are outlined in Appendix 2.



Additional data sources used in the Queensland State Accounts

In compiling the QSA, Queensland Treasury utilises a range of additional data to supplement the key ABS publications, i.e. the Australia National Accounts and Balance of Payments.

The key additional data sources used to compile the QSA, in particular to estimate the contribution from the interstate and overseas trade sectors, include:

- Queensland Treasury fiscal estimates
- ABS 5676.0 *Business Indicators, Australia*
- Other unpublished ABS data, in particular detailed overseas trade data
- Tourism Research Australia (TRA) *International Visitors in Australia* and *Travel by Australians*.

Publication of the QSA

Queensland Treasury publishes detailed QSA tables on the Queensland Government Statistician's Office's website at www.qgso.q1d.gov.au/products/tables/q1d-state-accounts-tables/index.php.

A detailed list of the 39 tables published by the QGSO is provided in Appendix 3. In summary, the QSA tables present an historical time series of the QSA estimates, and changes in the estimates, in four key formats:

- Queensland – quarterly
- Rest of Australia – quarterly
- Queensland – financial year
- Rest of Australia – financial year

For all four sets of estimates, tables are provided to present the data in terms of both current prices and chain volume measure (CVM), with the data provided in original, seasonally-adjusted and trend terms. Tables are also provided of the implicit price deflators² for all series in both original and trend terms.

Details of the methodological approach taken in developing CVM estimates, and the process undertaken to produce seasonally adjusted and trend estimates, are provided in Appendices 4 and 5.

² Implicit price deflator (IPD) are obtained by dividing a current price value by its real counterpart (the chain volume measure).



Appendices

Appendix 1 Abbreviations

ABS	Australian Bureau of Statistics
CVM	chain volume measure
GDP	gross domestic product
GSP	gross state product
LVT	low value threshold
QGSO	Queensland Government Statistician's Office
QSA	Queensland State Accounts
SFD	state final demand
SITC	Standard International Trade Classification
TRA	Tourism Research Australia



Appendix 2 Description of key components of Queensland State Accounts³

Household final consumption expenditure

Household final consumption expenditure (HFCE) is the net expenditure on goods and services by persons and expenditure of a current nature by private non-profit institutions serving households.

Household final consumption expenditure is largely based on ABS 5206.0 estimates, supplemented with data contained in TRA National Visitor Survey and ABS 5302.0.

General government final consumption expenditure

General Government final consumption expenditure (GGFCE) is the net expenditure on goods and services by government authorities, except those classified as public corporations, which does not result in the creation of fixed assets or inventories or in the acquisition of land and existing buildings or second-hand assets.

Estimates of these components are taken from the ABS 5206.0. In some instances, Queensland Treasury has incorporated additional information that has become available after the release of ABS estimates.

Private gross fixed capital formation

Private gross fixed capital formation is the total value of private sector producers' acquisitions, less disposals of fixed assets during the accounting period plus certain additions to the value of non-produced assets realised by the production activity of institutional units. Expenditure is broken down into dwellings, non-dwelling construction, machinery and equipment, livestock and orchards, intangible fixed assets and ownership transfer costs.

This item is compiled by the addition of the components of private investment: dwellings, non-dwelling construction, machinery and equipment, livestock and orchards, intangible fixed assets and ownership transfer costs. Estimates of these components are taken from the ABS 5206.0.

Public gross fixed capital formation

Public gross fixed capital formation is the value of new and existing produced assets, other than inventories, less the value of disposals of new and existing produced assets, other than inventories.

Estimates of general government and government owned corporations' investment, including Commonwealth, state and local investment, are generally taken from ABS 5206.0. In some instances, Queensland Treasury incorporated additional Queensland Government information that has become available after the release of ABS estimates.

Changes in inventories

Inventories consist of materials and supplies, work-in-progress, finished goods and goods for resale, and includes all inventories held by government.

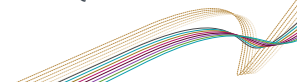
Estimates of these components are made by allocating the national inventory activity identified in the ABS 5206.0 to Queensland based on Queensland's share of national GDP.

Exports of goods, overseas

Exports of goods, overseas reflects the value of all transfers of ownership of goods from Queensland residents to residents of overseas countries.

Current prices estimates of Queensland exports and re-exports are derived using data from ABS Unpublished Foreign Trade file (ABS 5368.0) at the two digit Standard International Trade Classification (SITC) level. Currently, ABS 5302.0 estimates don't include Queensland re-exports for the full time series and since June 2013, do not include confidential items classified as 'State not available' by the ABS.

³ Descriptions of key state accounts components are largely sourced from *ABS Australian System of National Accounts: Concepts, Sources and Methods. 2014* (5216.0).



The QSA estimate supplements the ABS estimate with readily available Queensland re-exports data and a Queensland estimate of the 'State not available'.

The CVM series is estimated using Queensland specific two digit SITC implicit price deflators obtained from the ABS.

Exports of services, overseas

Exports of services, overseas reflects the value of sales of services provided by Queensland resident producers to residents of overseas countries, including sales to overseas residents visiting Queensland.

Estimates for Queensland are derived as a share of individual balance of payment service items from the ABS 5302.0. Data from the TRA International Visitor Survey and ABS *Overseas Arrivals and Departures* (ABS 3401.0) are also used.

CVM are derived using the corresponding national balance of payments services implicit price deflators sourced from the ABS.

Imports of goods, overseas

Imports of Goods, overseas reflects all transfers of ownership of goods from residents of overseas countries to Queensland residents.

The QSA estimates of Queensland imports of goods, overseas supplement the ABS 5302.0 estimate by incorporating Queensland estimates of civil aircraft imports, as well as incorporating balance of payment adjustments for capital goods and low value threshold (LVT) imports.

CVM are derived using Queensland specific implicit price deflators provided by the ABS.

Imports of services, overseas

Imports of services, overseas reflects sales of services provided by residents of overseas countries to Queensland resident, including sales to Queensland residents visiting overseas countries.

This is estimated for Queensland on a quarterly basis by calculating the State's share based on a range of indicators for individual balance of payment items published in ABS 5302.0.

CVM are derived using the national balance of payments implicit price deflators sourced from the ABS.

Exports of goods, interstate

Exports of goods, interstate reflect all transfers of ownership of goods from Queensland residents to rest of Australia residents.

Estimates have historically been derived from the ABS Queensland Interstate Trade Survey, in which interstate exports of goods are estimated by broad commodity group. From June quarter 2014, Treasury has estimated Queensland interstate trade based on historical movements and a range of indicators for the commodity groups, as the ABS survey is no longer conducted.

CVM are derived using Queensland and national implicit price deflators sourced from the ABS.

Exports of selected services, interstate

Exports of selected services, interstate reflect sales of services provided by Queensland resident producers to rest of Australia residents, including sales to rest of Australia residents visiting Queensland.

Exports of selected services interstate capture tourism services and are estimated using a combination of results from the TRA National Visitor Survey and ABS 5302.0. Historical expenditure figures have been derived using a combination of the above, Domestic Tourism Expenditure Surveys (1982, 1992), and Queensland Travel and Tourism Corporation's Queensland Visitors Survey.

CVM are derived using national balance of payments travel credits implicit price deflators sourced from ABS 5302.0.



Imports of goods, interstate

Imports of goods, interstate reflect all transfers of ownership of goods from interstate residents (rest of Australia) to Queensland residents.

Estimates have historically been derived from the ABS Queensland Interstate Trade Survey, in which interstate imports of goods are estimated by broad commodity group. From June quarter 2014, Treasury has estimated Queensland interstate trade based on historical movements and a range of indicators for the commodity groups, as the ABS survey is no longer conducted.

CVM are derived using Queensland and national implicit price deflators sourced from the ABS.

Imports of selected services, interstate

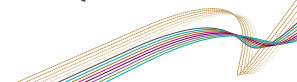
Imports of selected services, interstate reflect sales of selected services provided by resident producers of other states to Queensland, including sales to Queensland residents visiting other states.

Selected services capture imports of tourism services from interstate and are estimated using a combination of results from the TRA National Visitor Survey and ABS 5302.0. Historical expenditure figures were derived using a combination of the above, Domestic Tourism Expenditure Surveys (1982, 1992) and Queensland Travel and Tourism Corporation's Queensland Visitors Survey.

CVM are derived using national balance of payments travel credits implicit price deflators sourced from ABS 5302.0.

Statistical discrepancy

In line with the ABS practice, an explicit statistical discrepancy has been retained in the QSA. This discrepancy is allocated between the income and expenditure estimates to provide a unique measure of quarterly current GSP. This is pro-rated from the national estimates to Queensland using GSP/GDP.



Appendix 3 Queensland State Accounts – list of published tables

Queensland – quarterly

1. Queensland domestic production account, trend, chain volume measure ^(a), \$m, quarterly
2. Queensland domestic production account, trend, chain volume measure ^(a), quarterly percentage change, %
3. Queensland domestic production account, trend, chain volume measure ^(a), quarterly contribution to growth, percentage points
4. Queensland domestic production account, trend, chain volume measure ^(a), annual percentage change, %
5. Queensland domestic production account, trend, chain volume measure ^(a), annual contribution to growth, percentage points
6. Queensland domestic production account, seasonally adjusted, chain volume measure ^(a), \$m, quarterly
7. Queensland domestic production account, seasonally adjusted, chain volume measure ^(a), quarterly percentage change, %
8. Queensland domestic production account, seasonally adjusted, chain volume measure ^(a), annual percentage change, %
9. Queensland domestic production account, original, chain volume measure ^(a), \$m, quarterly
10. Queensland domestic production account, original, chain volume measure ^(a), annual percentage change, %
11. Queensland domestic production account, trend, current prices, \$m, quarterly
12. Queensland domestic production account, trend, current prices, quarterly percentage change, %
13. Queensland domestic production account, trend, current prices, quarterly contribution to growth, percentage points
14. Queensland domestic production account, seasonally adjusted, current prices, \$m, quarterly
15. Queensland domestic production account, seasonally adjusted, current prices, quarterly percentage change, %
16. Queensland domestic production account, seasonally adjusted, current prices, quarterly contribution to growth, percentage points
17. Queensland domestic production account, original, current prices, \$m, quarterly
18. Queensland domestic production account, original, current prices, annual percentage change, %
19. Queensland domestic production account, trend, implicit price deflators, 2012–13 = 100, quarterly
20. Queensland domestic production account, original, implicit price deflators, 2012–13 = 100, quarterly

Rest of Australia – quarterly

21. Rest of Australia domestic production account, trend, chain volume measure ^(a), \$m, quarterly
22. Rest of Australia domestic production account, trend, chain volume measure ^(a), quarterly percentage change, %
23. Rest of Australia domestic production account, seasonally adjusted, chain volume measure ^(a), \$m
24. Rest of Australia domestic production account, original, chain volume measure ^(a), \$m, quarterly
25. Rest of Australia domestic production account, trend, current prices, \$m, quarterly
26. Rest of Australia domestic production account, original, current prices, \$m, quarterly
27. Rest of Australia domestic production account, trend, implicit price deflators, 2012–13 = 100, quarterly



Queensland – financial year

28. Queensland domestic production account, original, chain volume measure, \$m, 1985–86 to 2013–14
29. Queensland domestic production account, original, chain volume measure, year on year percentage change, %, 1986–87 to 2013–14
30. Queensland domestic production account, original, chain volume measure, year on year contribution to growth, percentage points, 1986–87 to 2013–14
31. Queensland domestic production account, original, current prices, \$m, 1985–86 to 2013–14
32. Queensland domestic production account, original, current prices, year on year percentage change, %, 1986–87 to 2013–14
33. Queensland domestic production account, original, current prices, year on year contribution to growth, percentage points, 1986–87 to 2013–14

Rest of Australia – financial year

34. Rest of Australia domestic production account, original, chain volume measure, \$m, 1985–86 to 2013–14
35. Rest of Australia domestic production account, original, chain volume measure, year on year percentage change, %, 1986–87 to 2013–14
36. Rest of Australia domestic production account, original, chain volume measure, year on year contribution to growth, percentage points, 1986–87 to 2013–14
37. Rest of Australia domestic production account, original, current prices, \$m, 1985–86 to 2013–14
38. Rest of Australia domestic production account, original, current prices, year on year percentage change, %, 1986–87 to 2013–14
39. Rest of Australia domestic production account, original, current prices, year on year contribution to growth, percentage points, 1986–87 to 2013–14

(a) Chain volume measure reference year 2012–13.



Appendix 4 Development of chain volume measures

All the current price aggregates of expenditure appearing in the QSA are estimates of the sums of individual transactions. Each of these transactions has two components: price and quantity.

In order to measure by how much the 'volume' of GSP has changed between two periods, it is necessary to measure the value of GSP in each period using the same unit prices. Chain volume measures (CVM) in the QSA provide time series of expenditure aggregates that are free from the direct effects of price change.

CVM are derived by weighting period-to-period indexes of volume estimates of component at the lowest level at which volume estimates are derived.



Appendix 5 Development of seasonally adjusted and trend estimates

Seasonally adjusted estimates

The seasonal component of a time series comprises three main types of systematic calendar related influences: seasonal influences, trading day influences and moving holiday influences. More information on these influences is available in the ABS information paper, *An Introductory Course on Time Series Analysis* (ABS 1346.0.55.001).

Seasonal adjustment removes the estimated effects of seasonal and other types of calendar variations from the statistical series, so that the effects of other influences can be analysed. To produce smoothed seasonally adjusted estimates for the QSA, seasonal factors are obtained using the X-12Q procedure (developed by the U.S. Bureau of the Census). The X-12Q procedure uses an iterative system of moving averages and linear regression techniques to obtain seasonal and other systematic calendar effects.

For quarterly series, prior adjustments can be incorporated for moving holidays and trading day adjustments. However, in accordance with the methodology used by the ABS to adjust the Australian National Accounts, it is assumed that the trading day effects on quarterly QSA series are likely to be insignificant, except in the case of private final consumption expenditure.

Separate current and CVM seasonal factors are calculated for interstate and foreign imports and exports of tourism services, reflecting the seasonality in the implicit price deflators of these series.

Differences in the estimates and assumptions, as well as judgments made in the smoothing procedure, may result in the seasonally adjusted estimates in the QSA for corresponding estimates being different to those produced and published by the ABS.

Trend estimates

Trend estimates may be produced by smoothing out the residual/irregular components of the seasonally adjusted series. The trend component is defined as the long term movement in a series and is typically a result of influences such as population growth, price inflation and general economic development.

QSA trend estimates are compiled by applying a seven term Henderson moving average, similar to that used by the ABS and outlined in the ABS information paper, *A Guide to Smoothing Time Series —Monitoring Trends* (ABS 1349.0). The Henderson procedure is a symmetric moving average that is centred on a point in time that is designed to minimise the distortion to trend level, turning point and timing.

The Henderson method uses individually tailored end-weights to overcome the end-point problem (insufficient observations available for the calculation of the last three quarters of a series). These end-weights reflect the irregularity of the series being trended.

Differences in the estimates and in assumptions and judgments made in the filtering procedure may result in the trend estimates of some aggregates in the QSA being different from the corresponding estimates published by the ABS.

It should be noted that as new seasonally adjusted estimates become available, trend estimates are revised. These revisions are the combined result of the concurrent seasonal adjustment process and the application of the tailored end-weights for the last three quarters to the seasonally adjusted series.

