

Enhancements in the Australian National Accounts

Meeting of the Group of Experts on National Accounts
Geneva, 22-25 May 2018

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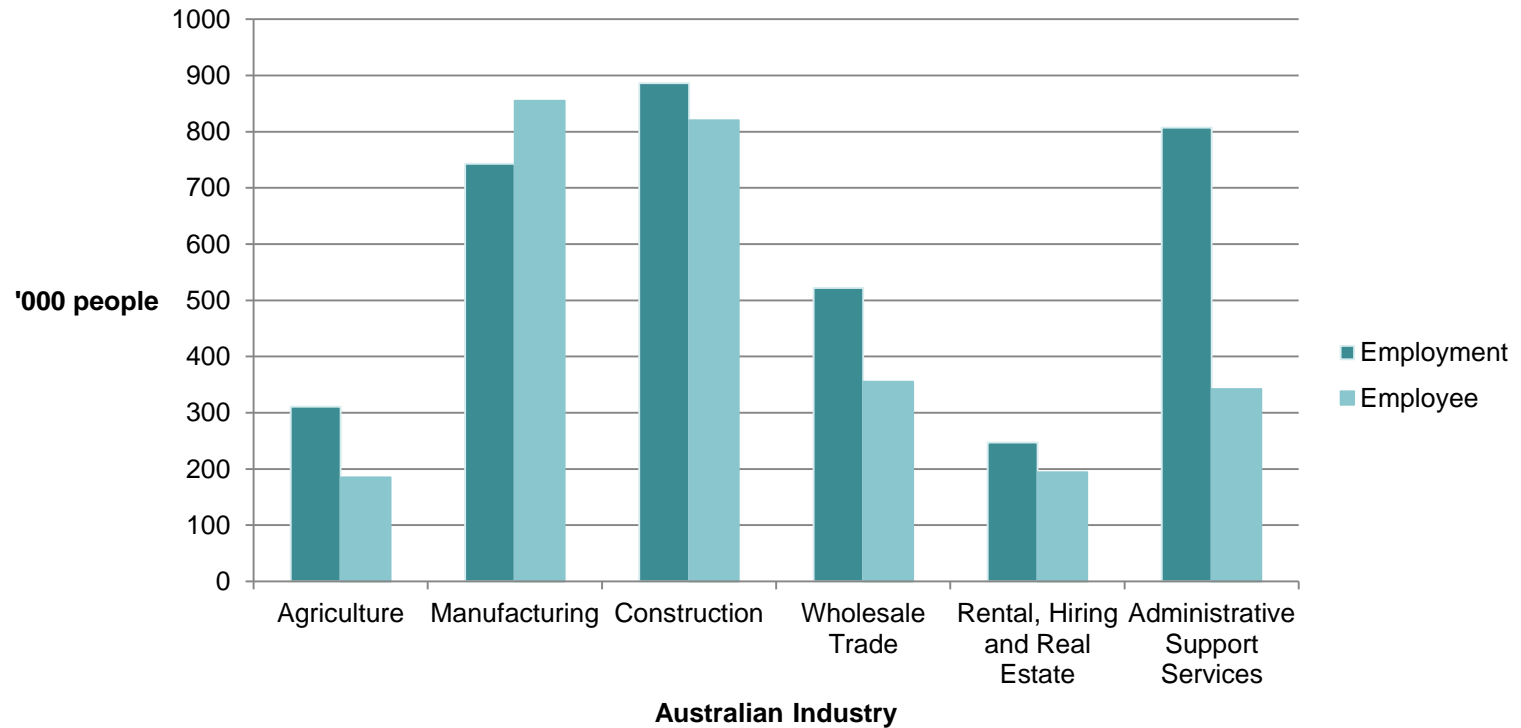


Presentation Outline

- Recent developments undertaken by the Australian Bureau of Statistics that enhance the Australian National Accounts:
 1. Australian Labour Account
 2. Transactions data
 3. Constrained optimisation
- Conclusion



2016-17 Employment by Industry





Persons

Describes key labour supply identities.



Jobs

Describes key labour demand identities.

Labour Account



Labour Volume

Describes the relationship between hours of labour supplied by individuals and hours of labour used by businesses.



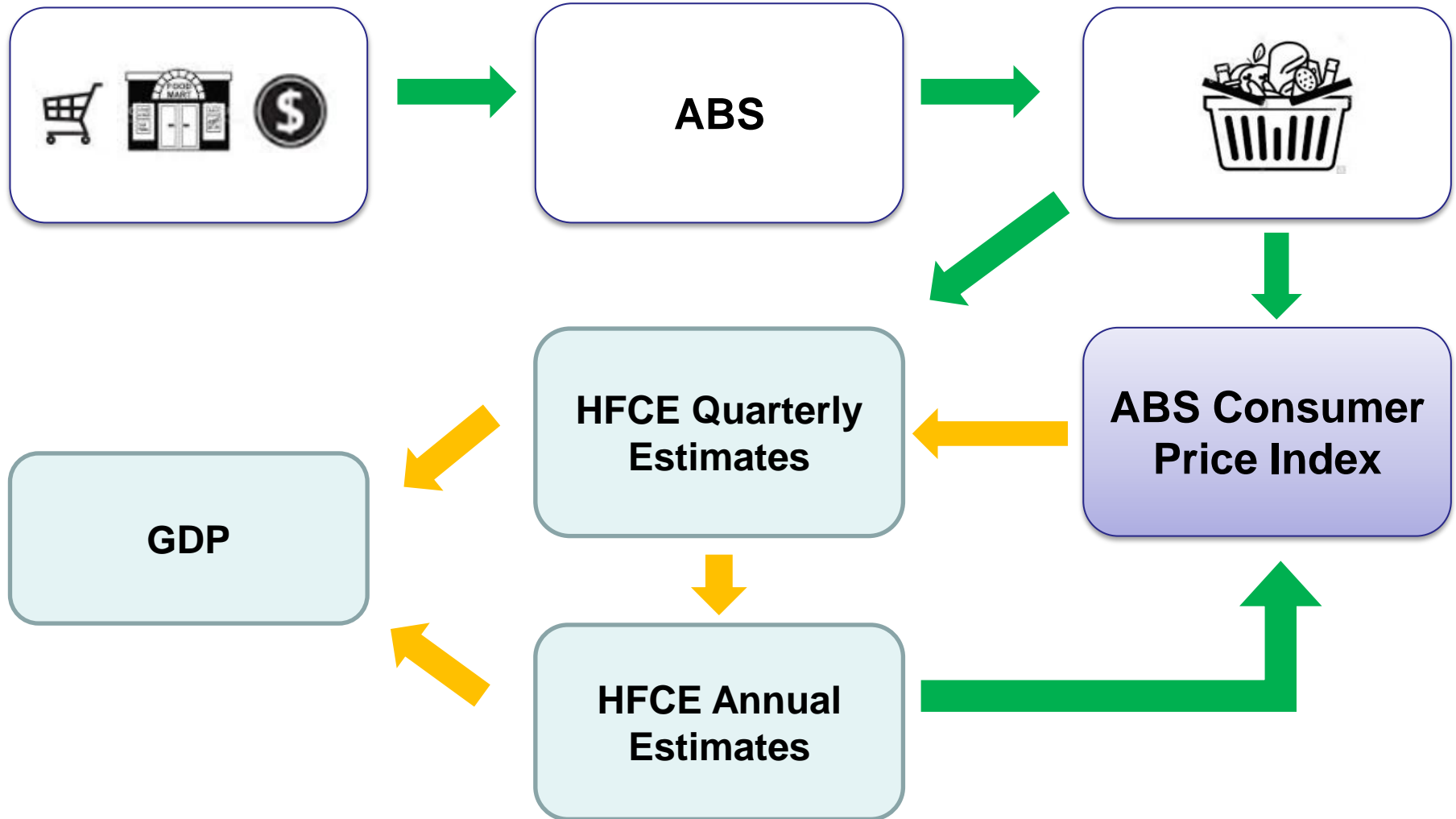
Labour Payments

Describes the relationship between total labour costs by business and total labour income of workers.

Australian Labour Account

- The Annual Australian Labour Account was first published in June 2017
- This account has an annual time series from 2010/11 - 2015/16
- Conceptual framework harmonised with the Australian System of National Accounts
- Work is now underway to compile and publish a quarterly Labour Account

Transactions data





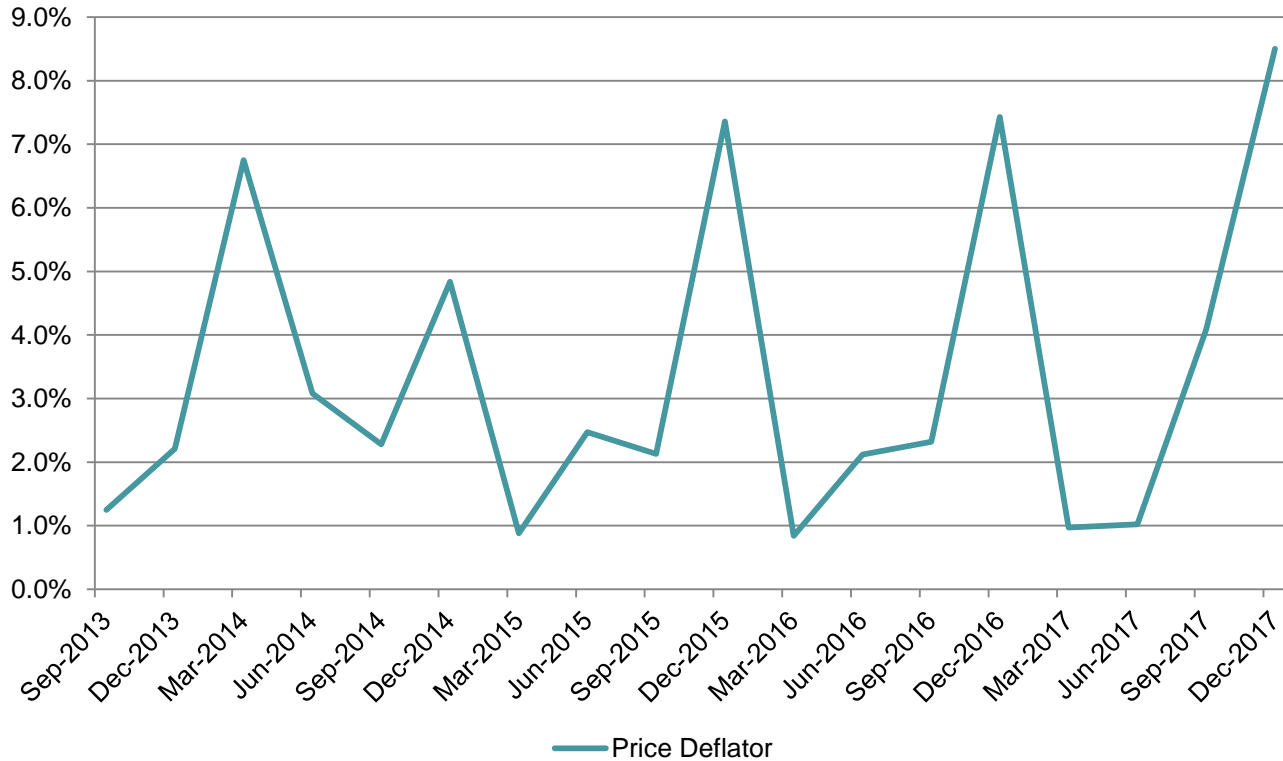
- The Australian Prices Branch has significantly increased the use of transactions data:
 - The use of transactions data was introduced in the March quarter 2014
 - In the December quarter 2017 the Australian CPI implemented multilateral method to maximise the use of transactions data.
- This method allowed for the following enhancements:
 - Using a census of products
 - Weighting prices at the product level
 - Automated processes
- This new method mitigates substitution bias and ensures high quality price deflators for the Household Final Consumption Expenditure estimates of National Accounts.



- Household consumption of cigarettes and tobacco
 - Historically estimated as a residual of production plus imports less exports.
- Repeated tobacco excise increases
 - Changed the behaviour and timing associated with the production, imports and inventories of cigarettes and tobacco.
- Domestic production of cigarettes and tobacco ceased
 - Companies operating within Australia on the production of tobacco reclassifying their operations to Basic Material Wholesaling.
- The solution - transactions data
 - Contains a product code, product descriptions, prices, quantities and retail outlet metadata.
 - Data are reshaped to incorporate the required temporal and spatial dimensions for National Accounts.

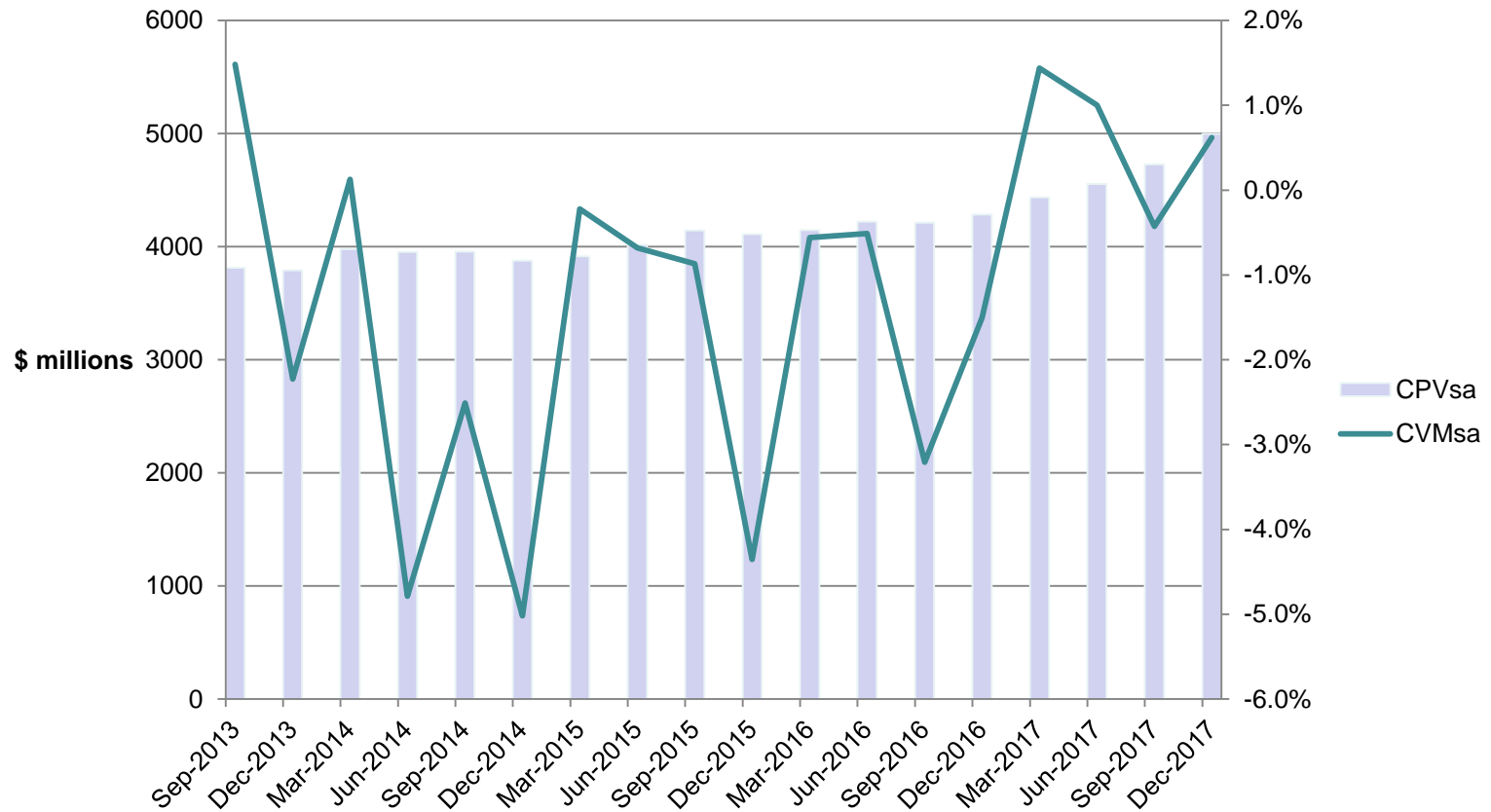


Cigarettes and Tobacco





Cigarettes and Tobacco HFCE, Quarterly



Annual re-weight of the CPI

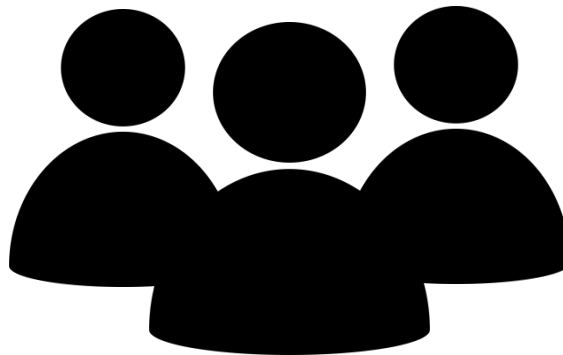


- The CPI Expenditure Class weights are updated every 6 years primarily using the ABS Household Expenditure Survey
- From December quarter 2018 Household final consumption expenditure will be utilised to annually re-weight the CPI, this allows for:
 - improved accuracy with more representative weights,
 - aligning with international recommendations,
 - ensuring continued production of a robust CPI, and
 - benefits in the CPI to directly impact on quality improvements in the National Accounts and provide greater coherence across macro-economic statistics within the ABS.

Constrained optimisation



- Through the ABS transformation program, the Australian National Accounts capitalised on the opportunity to undertake considerable improvements to some of the more resource intensive and iterative processes.
- Historically, the Supply-Use balancing process and Input-Output table compilation have required:



Constrained optimisation

- Constrained optimisation was seen as an opportunity to create efficiency in both the Supply-Use and Input-Output processes.
- The optimisation method is based on Weighted Least Squares (WLS). This method reduces the needs for manual intervention and provides a more efficient adjustment process.
- The major components within the optimisation method are defined as:
 - The decision variable
 - The constraints
 - The objective function



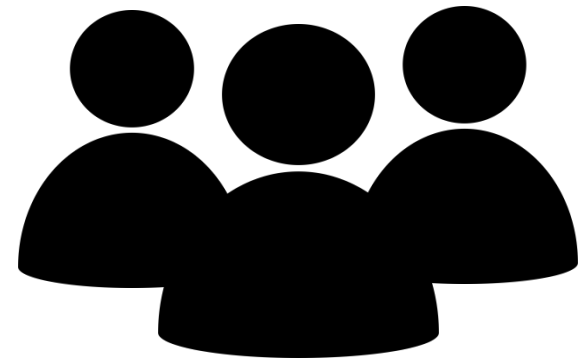
Constrained optimisation

- During 2017, constrained optimisation was tested on the Supply-Use process
- 74 high level constraints, in addition to business rules that need to be satisfied
 - Hard constraints must be satisfied
 - Soft constraints should approximately be satisfied
- Concurrently balances in current prices' and previous year's prices
- The program can fully balance four years of Supply-Use data in 1 minute



Constrained optimisation

- Input-Output tables are constrained by the Supply-Use tables
 - Contain 918 products by 114 industries
- The top 100 contribute approximately 70% to total Supply
- 59 high level constraints
- In 2018, Input-Output tables and the Annual Australian National Accounts will be published having used CO techniques



Conclusion

The Australian National Accounts have capitalised on recent enhancements undertaken within the ABS to improve the quality of output.

- The annual Australian Labour Accounts have been published with the quarterly accounts under development, providing a useful additional data source and confrontation tool in the Australian National Accounts.
- Enhancements undertaken in CPI improve the quality of price deflation in National Accounts. The use of transactions data has led to improved quarterly estimation of HFCE on Cigarettes and tobacco and increased use of administrative data continues to be a focus for the ABS.
- The use of constrained optimisation will improve efficiency in compiling National Accounts and allow for increased time for analysis and research.

Thank You

