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STATISTICS AND DATA DIRECTORATE****Working Party on Financial Statistics****The history and future plans for historical revisions throughout the Australian
Bureau of Statistics (ABS) macroeconomic accounts****Joint meeting of the Working Party on Financial Statistics and the Working Party on National
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Throughout the history of the ABS economic statistics, ABS has attempted to come up with a consistent policy on the timing of when historical revisions (benchmark revisions) are implemented throughout the national accounts (including the financial accounts and balance sheets), international accounts (Balance of Payments and International Investment positions) and Government Finance statistics (GFS), referred to here as the macroeconomic accounts.

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*The history and future plans for historical revisions
throughout the Australian Bureau of Statistics (ABS)
macroeconomic accounts*

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Throughout the history of the ABS economic statistics, ABS has attempted to come up with a consistent policy on the timing of when historical revisions (benchmark revisions) are implemented throughout the national accounts (including the financial accounts and balance sheets), international accounts (Balance of Payments and International Investment positions) and Government Finance statistics (GFS), referred to here as the macroeconomic accounts.

Even though the ABS to date does not have a policy on the timing of historical revisions throughout the macroeconomic accounts, the ABS has undertaken a harmonised implementation between these accounts three times in the last 20 years (the implementation of SNA 93 and BPM 5; 2008 SNA and BPM6; and more recently in 2017). In September quarter 2021, ABS plans to undertake another historical revision cycle for the macroeconomic accounts. As with past cycles, the planned historical revisions will face challenges such as (i) the implementation and receipt of the most recent source data; (ii) implementation of revisions throughout the whole time series, including the Supply Use benchmarks; (iii) the coordination of work flows and workload of 300 staff working on the historical revisions; (iv) compilation and release of the regular quarterly and annual statistics during the historical revisions ; (v) communication strategies with major users; (vi) possible suppression strategies for estimates until September 2021; and (vii) maintenance of dual compilation systems. This paper discusses these issues and strategies to address them.

1. Introduction

1. Economic statistics are typically high frequency data (quarterly) that require a trade-off between accuracy and timeliness: this tension inevitably leads to revisions in published series. Revisions cannot be avoided but should be understood, explained and minimised (frequency and size) where possible. The ultimate aim is to provide the best and most coherent estimates of economic activity and economic structure as soon as possible.

2. Statistical revisions are carried out regularly by the individual areas within the Australian Bureau of Statistics (ABS) macroeconomic statistics to reflect the most current information and estimation methods. Annual revisions limited to the previous four years of data are applied within the Annual Australian System of National Accounts (ASNA), Quarterly National Accounts (QNA) and Government Finance Statistics (GFS) in September quarters (Quarter 3), and Balance of Payments (BoP) and International Investment positions (IIP) in June quarters (Quarter 2).

3. Periodically the ABS implements historical revisions to its macroeconomic accounts ('benchmark revisions') to: improve data quality (e.g. incorporating cyclical data collections such as the five yearly Population Census); adopt new international concepts and classifications; and implement changes in methods. In the last 20 years, the ABS has undertaken a harmonised implementation of historical revisions in the macroeconomic accounts three times, the implementation of: System of National Account (SNA) 93 and Balance of Payment Manual (BPM) 5; 2008 SNA and BPM6; and more recently in 2017. The next historical revision is planned for the 2020-21 annuals and September quarter 2021 respectively.

4. In between these historical revisions, the ASNA, BoP and IIP areas have independently undertaken revisions to their entire time series ("independent historical" revisions). And within the ASNA, the financial accounts and balance sheets have revised their time series independent of the real side of the ASNA accounts. Each area would have justified these independent revision cycles at the time. Outlined below are the impacts on the outputs of the macroeconomic accounts of such independent historical revisions:

- The 2010-11 annual ASNA published revisions for the whole time series for GDP related estimates (e.g. back to 1959-60), domestic sectoral income accounts and capital accounts. The external account, financial accounts and financial balance sheets revised back four years to 2006-07;
- In the September quarter, 2011 ASNA releases published revisions for the whole time series for GDP related estimates, income accounts, capital accounts and non-financial balance sheets, while the financial accounts and balance sheets were revised back to June quarter 2009. Within the BoP and IIP releases, GDP related estimates were revised for the entire time series, while the primary and secondary income flows were revised back to September 2010;
- The September quarter 2013 release of IIP incorporated revisions to the entire time series for some series; and
- ASNA financial accounts and balance sheets were revised back to June 2002 (March quarter 2011 release) and whole time series back to June 1988 (June quarter 2014 release).

5. Paragraph 4 outlines the incoherence in the time series of the macroeconomic accounts due to the timing of independent historical revision cycles. The obvious solution is to undertake a co-ordinated historical revision across the macroeconomic accounts, which the ABS did in 2017. ABS plans to undertake the next historical revision in 2021.

6. The ABS would ideally like to develop a historical revisions policy that balances timeliness, accuracy, capacity, user requirements etc., we are in the early stages of undertaking a scoping exercise on formulating such a policy. Part of the exercise will include (i) taking into account the issues and challenges of implementing a historical revision, and (ii) engaging with NSOs on their policies on timing of historical revisions. This paper discusses in detail point (i) above by using the 2021 historical revisions as an example. During the presentation of this paper at the joint meeting of the WPFS and WPNA, the ABS will try and obtain some feedback on point (ii) from delegates attending the meeting.

2. Implementation of Historical Revisions

2.1. Source data

7. A key driver for historical revisions is the inclusion of updated data collections available every few years such as the five yearly ABS Census of Population and Housing (the Census) and six yearly ABS Household Expenditure Survey (HES). Without a policy regarding timing of historical revisions, the comparative importance of individual data collections feeds into the decision as to when to undertake the historical revision. For example, the 2021 historical revisions will include data from the new APRA (Australian Prudential Regulation Authority) Economic and Financial Statistics (EFS) collection for the banking sector but will not include data from the 2021 Census or the next ABS HES (planned for 2022) due to unavailability of any data from these later collections. The trade-off between waiting for the Census data and HES data and implementation of the EFS banking collection had to be made. The decision was based on two important factors of data coherence and comparability:

- EFS banking balance sheet data available from July 2019 was implemented by the Reserve Bank of Australia (RBA - central bank) in July 2019 monthly credit aggregates. To maximise data comparability between the RBA and ABS, the EFS banking balance sheet will be implemented in the September quarterly 2019 ASNA financial accounts and balance sheets due for release in December 2019; and
 - To minimise the incoherence between the real side of ASNA accounts (GDP, income accounts) and financial accounts and balance sheets, EFS banking data need to be implemented at the earliest possible date. The new EFS income and expenditure banking collection will be available from June 2020; this data is required in the compilation of bank Financial Intermediation Services Indirectly Measured (FISIM) along with balance sheet information. FISIM estimates are part of Supply and Use (SU) table benchmarks, and the earliest these FISIM estimates can be included in the SU benchmarks is in the SU 2021 cycle.
8. The 2021 historical revision will also incorporate the following new data sources:
- ABS annual Australian Industry Survey (AIS) sources: the health survey, the retail and wholesale industry survey and the transport survey; and

- Annual and quarterly data from the ABS Labour Accounts.

2.2. New methods and Classification

9. Incorporation of new methods, standards and classifications is also an important driver for undertaking historical revisions. ABS and many National Statistical Offices (NSOs) undertook these revision cycles when implementing the latest international standards such as the SNA, BPM and GFS. One of the key challenges the ABS macroeconomic statistics areas faced in implementation of the 2008 SNA and BPM 6 in late 2009 was separating out the revisions in economic statistic due to the new standards and actual structural changes that the Australian economy experienced due to the Global Financial crisis (GFC). At the time, some of our major users did flag with the ABS the possibility of delaying the international standard changes, as their major interest in the macroeconomic statistics was to assess the impact of the GFC. Due to the significant work program that the ABS had already done to implement the standards changes (e.g. changes to ABS collections, statistical compilation system and methods) this was not a realistic option for the ABS.

10. For the 2021 historical revisions the following projects will be implemented:

- A review of Household Final Consumption Expenditure (HFCE) to improve the overall quality of HFCE estimates. This is a critical piece of work noting that estimates of HFCE have recently been scrutinised by key users in the context of increased volatility and revision in HFCE estimates. HFCE estimates are also important given the move to annual re-weighting of Consumer Price Index (CPI) using HFCE in 2018. It is expected that the review will be fully completed by the first half of 2021. The review involves two significant phases of work. Phase 1 is a fundamental review of how we compile HFCE. Any key method changes are planned for implementation as part of the 2021 historical revision cycle. Phase 2 of the review is investigating the possible use of new data sources but this will most probably be outside of the 2021 revisions window.
- The implementation of the new Classification of the Functions of Government (COFOG) outputs from GFS into the wider macroeconomic suite of accounts (i.e. beyond the annual GFS releases where the new classification has already been implemented). Following initial implementation in 2019, GFS compilers are undertaking additional quality assurance of lower level COFOG outputs across the historical time series ahead of the 2021 SU benchmarks;
- Enhancement of the measurement of output volumes for non-market industries; and
- Many of the macroeconomic account series are released on a seasonally adjusted and trend basis and the long time series of revisions due to historical revisions will require seasonal reanalysis. Also, revisions may occur as a result of a review of the application of direct and indirect seasonal adjustment across economic statistics (including source data series).

2.3. Impact on the macroeconomic time series

11. To understand the impact of the historical revisions on the time series it is necessary to understand macroeconomic statistical process.

12. The national accounts are compiled on a quarterly and annual basis constrained to an annual SU table benchmark for GDP and its components. The annual time series of SU tables starts in 1994-95 (for current prices) and in 1995-96 (for volume tables). SU tables balance the three measures of GDP such that the same annual growth rate and level estimate are obtained. They are compiled on an annual basis up to the year t-1. For example, for the annual ASNA release of 2018-19 (released at the end of October 2019) will contain SU table benchmarks up to and including 2017-18. Within the ASNA, the three measures of GDP prior to the 1994-95 are not balanced.

13. The policy within macroeconomic historical revisions is that the annual and quarterly time series will open up for revisions back to the start of the annual and quarterly time series. For example, within the ASNA 2020-21 annual and September 2021 quarterly, estimates will be revised back to 1959-60 and within the annuals the SU table benchmarks will be revised back to 1994-95. The GFS estimates will be revised back to 1998-99 and fed into the ASNA. The quarterly BoP and IIP releases will be revised back to the start of the time series which is 1988-89. The policy of opening up the whole time series within the macroeconomic accounts does incur a significant cost in time/effort to put together, for example, times series for 60 years in the ASNA and SU benchmarks for 25 years. The issue of possibly having a cut off year for implementing historical revisions will be part of the scoping exercise for formulating a policy for the timing of historical revisions.

14. In this historical revision environment, the timeframe for the approach is constrained due to the additional time required to compile and balance the SU tables. New source data and methods need to be available approximately 6 - 12 months before release in a historical revision year.

15. The main objective of undertaking historical revisions is to have a coherent, timely, and accurate set of macroeconomic accounts. Of the three historical revisions undertaken so far, each didn't quite meet the main objective completely. For example, in the 2017 historical revision not all the time series data published in ASNA annual 2016-17 (in October 2017) were coherent, with issues within annual financial accounts and balance sheets. These annual financial accounts and balance sheets published in October 2017 did not contain the new source data for the pension fund sector and other improvements to methods within these accounts. The main reason was that due to resource constraints (staff and systems) impacting on the quality assurance process of the new pension fund data, the compilation of these accounts could not meet the annual ASNA publication deadline. However, by December 2017, the September quarter 2017 releases included a high quality coherent set of the macroeconomic accounts. In January 2018, the ASNA annual 2016 17 was re-released including updated annual financial accounts and balance sheets and therefore a coherent set of annual macroeconomic accounts was available approximately 2 months after the original release.

16. The EFS banks' balance sheet data which will be implemented in the September quarter 2019 ASNA financial account and balance sheets will cause incoherence between:

- Annual financial accounts and balance sheets within the releases of ASNA 2018-19 and ASNA 2019-20; and
- Quarterly releases up to June quarter 2021 of ASNA GDP and components and income accounts.

17. The reasons for some of this incoherence are discussed in paragraph 7, i.e. to minimise incoherence between data published by the central bank and the ABS; and unavailability of the income and expenditure data for EFS banks sector until middle of

2020. Other reasons include the SU table benchmarking compilation process and overall workflow between the macroeconomic account compilation teams which in turn are constrained by resource budgets and current system compilation capability.

2.4. Coordination across macroeconomic accounts and source data areas

18. To successfully undertake a historical revision the following elements are needed:

- Senior managerial agreement;
- Work flow plans for the macroeconomic accounts (and source data areas) within an overall project management framework (including risk management); and
- Robust governance.

19. The 2021 historical revision project was approved in early June 2019 by ABS senior management within economic statistics and the Australian Statistician, David Kalisch.

20. Governance for the historical revisions project will start in November 2019. The project management of the historical revisions project needs to ensure: essential activities are embedded in the work flow plans of the “business as usual” (BAU) annual and quarterly macroeconomic accounts work; also work plans to implement new source data (e.g. EFS banking data); and coverage of new methods (e.g. HFCE review project) need to be included. Importantly the work balance between the BAU and project work of over 300 staff across the macroeconomic accounts and source data areas need to be planned, coordinated and monitored with risk plans; and any risks from a staffing perspective need to be addressed promptly. The wellbeing of staff in the next few years while the 2021 historical revisions project is underway is paramount. For some staff, in particular the source data areas, the work for the historical revisions project has already commenced, with requirements and forms testing for the 2019-20 transport industry product survey and the retail and wholesale product survey currently underway, this is approximately two years before the release of the historical revision estimates.

21. Below is a draft summary of work flows that need to occur across macroeconomic accounts for the 2021 historical revisions, with first estimates published in ASNA 2020-21 (release late October 2021).

2.4.1. ASNA financial accounts and balance sheets and International Investment Position (IIP)

- Complete time series (up to 2018-19) of revised source data required for the ASNA financial accounts and balance sheets delivered by early October 2020. This includes financial information from ABS Survey of Financial Information (SFI), ABS Survey of International Investment (SII) and APRA (e.g. banks, pension funds, non-life insurance corporations). This would require source data area staff to start work on these historical revisions in July 2020;
- Revised interest flows and import and export of FISIM estimates from the IIP finalised up to and including 2018-19 by the end of November 2020;
- Revised quarterly financial accounts and balance sheet up to 2018-19 finalised by the end of November 2020. The financial balance sheets and IIP interest flows and import and export of FISIM are required in the compilation process of SU table benchmarks for GDP and related components;

- The revisions to the ASNA financial accounts and balance sheet and the IIP historical revisions up to and including estimates for 2018-19 would be quarantined and published a year later for the first time in the annual ASNA 2020-21 (October 2021) and September quarter 2021 macroeconomic account releases in December 2021;
- The revised financial balance sheets and IIP interest flows are used to compile Gross Operating Surplus (GOS) estimates (including FISIM) for Finance and Insurance subdivisions from December 2020 through to January 2021. The initial deliveries of 1994-95 to 2018-19 estimates are delivered to SU team by end of January 2021 for SU table benchmark compilation; and
- Second delivery (1994-95 to 2018-19 estimates) at the end of March 2021 of Finance and Insurance GOS benchmarks for SU compilation with any new revisions, and final delivery to SU team by end of April 2021 for whole of the time series (1994-95 to 2019-20) for SU table benchmarks.

2.4.2. International Trade and Balance of Payments (BoP)

- Work for historical revisions begin in July 2020;
- Complete time series (up to 2019-20) of revised International Merchandise Trade and Services, and other BoP estimates required for the SU tables are delivered by April 2021;
- From May 2021 work will continue on quarterly revisions back to start of the time series and annuals prior to SU table benchmarks;
- The June quarter 2021 Balance of Payments and International Investment Position release will include 5 quarters of revisions. Revisions prior to December 2019 quarter will be quarantined and stored;
- Following release of the June quarter 2021 data, historical revisions will applied to Trade, BoP and IIP estimates back to 1959 to June 2021 for the September quarter 2021 BoP/IIP release;
- Monthly International Trade in Goods and Services publishes historical revisions in the August 2021 month issue (released in October 2021);
- The historical revisions published in the quarterly Balance of Payments and International Investment Position in December 2021.

2.4.3. GFS

- A complete and revised annual GFS time series will be provided to SU area from 1998-99 to 2019-20;
- Any methodology or conceptual changes where the impacts up to 2017-18 can be quantified are delivered to SU area by end December 2020;
- To ensure consistency between statistical treatment in SU benchmark tables and annual GFS, any revisions to methods and classifications are agreed to between the two areas in February 2021, as the annual GFS publication is released in April 2021, 6 months before the same revisions will be reflected in the ASNA (October 2021);

- First delivery for implementation in the SU tables by the end of March 2021 (preliminary data), with a second delivery at the end of April 2021 (published GFS data) and provisioning for a final delivery in May /June 2021 if required to incorporate any final revisions or adjustments; and
- GFS staff ensure alignment of the GFS quarterly data (required in the QNA) with the annual GFS data implemented within the SU tables.

2.4.4. Business surveys

- Complete time series (up to 2019-20) of revised source data required for the SU tables are delivered by May 2021. This includes but is not limited to the following collections:
 - Economic Activity Survey including flexible surveys;
 - Value of Agricultural Commodities;
 - Survey of Employees and Earnings;
 - Building Activity Collection;
 - Engineering Construction Survey;
 - Mining Commodities;
 - Energy, Water and Environment Survey;
 - Business Expenditure on R&D (delivered by August 2020).
- Planning for the Economic Activity flexible collection occurs two years ahead of implementation, this ensures the survey is conducted a year ahead of implementation. For the planned 2020-21 historical revisions, the flexible survey includes detailed collection of product data on Transport, Retail and Wholesale industries.
- To ensure consistency between statistical treatment in SU benchmarks and quarterly indicators, any revisions to methods and classifications will be applied to sub-annual business surveys in September quarter 2021. Examples of sub-annual business surveys include:
 - Quarterly Business Indicator Survey (QBIS)
 - Private New Capital Expenditure and Expected Expenditure
 - Monthly Retail Trade (from July 2021)

2.4.5. Labour Accounts

- A complete time series (from 1994-95 to 2019-20) of Labour Accounts estimates compiled by December 2020, these estimates are based on Annual Industry data (for 2018-19) and annualised quarterly QBIS information (for 2019-20);
- Revised annual Labour Accounts 1994-95 to 2020-21 produced in early October 2021 inclusive of revised historical SU Tables (dependant on the delivery of the SU Tables in mid-late September 2021);
- Revised quarterly Labour Accounts from September 1994 to June 2021 inclusive of benchmarked Supply Use Tables produced by early November 2021.

2.4.6. Implementation of new methods and Classifications

- The ABS has two governance boards that provide leadership and oversight of conceptual and methodological changes - The Conceptual Classifications Committee (CCC) and Economic Statistics Methods Board (ESMB). All conceptual and methodological changes require oversight and sign-off by the CCC and ESMB. For 2021 historical revisions, all changes need to be signed off by these two committees by June 2020.
- For 2021 historical revisions, the results from the HFCE review project, COFOG implementation, improved output volumes for health and education, and large number of small methodological improvements are planned to be implemented and finally delivered to the SU benchmarks team by April 2021.

2.5. Communication strategies with users

22. For the previous three historical revisions, the ABS engaged with users and stakeholders in various ways. Strategies included: (i) the release of information papers on the ABS website informing of the upcoming changes from conceptual, methodological and metadata (of series) perspective; (ii) face to face meetings with major users such as the central bank and other policy areas of government to cover in detail changes that impacted specifically on their policy interest; (iii) notes within the macroeconomic account publication releases advertising the upcoming changes in future releases; (iv) seminars held across the major capital cities to discuss changes with users, this was a significant strategy for the implementation of 2008 SNA and the industry classification (ANZSIC 06); (v) engagement via formal ABS user groups e.g. Economic Statistics Advisory Group (vi) notifications to international statistical organisations such as OECD and IMF regarding upcoming changes; and (vii) technical notes within the release explaining the reasons for the revisions (concepts, classifications, methods or source data).

23. For the upcoming 2021 historical revisions, the ABS will implement all the seven identified strategies above. However, new ones will be implemented such as:

- Undertaking some question and answer session with users (including journalists) via webinars before and possibly after implementation;
- Utilising the ABS Chief Economist to inform the economist cohorts including chief economists within the private and public sector, and journalists;
- Including information on changes in media releases (prior to release and at time of release); and
- Briefing the office of the Minister responsible for the ABS.

24. The quarantining of estimates within the macroeconomic accounts for approximately a year after the availability of the source data, and the reasons for this (as discussed in sections above) need to be clearly articulated with our users, in particular our major users. Especially in terms of its possible impact on the current measurement of economic activity and structures.

2.6. Dual compilation systems.

25. The lead time of 18 months of work for the compilation of the historical revisions plus the need to quarantine these revisions from current BAU macroeconomic accounts

means that parallel compilation systems need to be constructed and adopted for the historical revision project. The parallel systems will ensure that BAU compilation systems are not jeopardised and there is no risk of unwanted revisions going through these estimates due to historical revision changes. This approach will also enable staff to seamlessly move between the two systems environments and plan their work accordingly.

26. All areas of the macroeconomic accounts have implemented parallel compilation systems for the past historical revision projects. However, the ease of developing and maintaining parallel system has varied across the macroeconomic accounts and source data areas. Some compilation systems have aged significantly (and may include legacy software no longer corporately supported), are cumbersome to run and are more fragile than others. The resource cost increase of maintaining dual systems will depend on the robustness and flexibility of each compilation system, and will be monitored through the project management framework, in particular through the risk plans for each area.

2.7. Conclusion

27. The paper provides a summary of the issues that need to be considered in undertaking a historical revision, using specifically the planned historical revision in the macroeconomic accounts in 2021. The issues and the challenges of undertaking the historical revision highlighted in the paper will be taken into account by the ABS macroeconomic accounts division in formulating a future policy on the timing of these historical revisions.

28. The paper highlighted issues in deciding which source data to include; the implementation of new methods and classification and what will be included in the 2021 historical cycle; impacts on time series within the macroeconomic accounts; detail of the coordination required across the macroeconomic accounts and the source data areas; past and planned communication strategies with users; and implication for the statistical compilation systems environment.