TECHNICAL ASSISTANCE REPORT

SOUTH AFRICA

Report on National Accounts Statistics Mission (May 11 – 22, 2026)

AUGUST 2026

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Acronyms

SNA2025	*System of National Accounts 2025*
AFS	IMF Regionals Technical Assistance Center for Southern Africa- AFRITAC South
IMF	International Monetary Fund
QES	Quarterly Employment Statistics Survey
QNA	Quarterly National Accounts
SARB	South African Reserve Bank
STATS SA	Statistics South Africa
TA	Technical Assistance

Summary of Mission Outcomes and Priority Recommendations

1. A technical assistance (TA) mission on the National Accounts, sponsored by IMF AFRITAC South (AFS), was conducted from May 11 – 22, 2026, at the request of Statistics South Africa (Stats SA). This mission was conducted in person and built on previous technical assistance.

2. The mission assisted with the seasonal adjustment of the short-term and quarterly National Accounts (QNA) while following a principle of harmonization and coherence. Consistency between the short-term estimates and QNA is a priority area for both Stats SA and external users. The mission noted that this has improved since previous missions, and there is now a culture of comparing growth rates between the short-term and the QNA estimates.

3. The quality of the seasonally adjusted estimates is directly impacted by the seasonal adjustment parameters. The mission was advised that previous seasonal adjustment parameter reviews completed by methodology experts had not been updated within the business areas, with some exceptions. This will have had impacts on the quality of the published seasonally adjusted estimates. The mission recommended that updated seasonal adjustment parameters are implemented as a matter of course within the production schedule, while also managing revisions to previously published seasonally adjusted estimates.

4. Assessment of residual seasonality in published seasonally adjusted estimates is a crucial step in monitoring quality. The mission demonstrated how to assess the published seasonally adjusted aggregates and recommended that this becomes a standard quality assessment before publication.

5. Seasonal adjustment is a combination of both visual and statistical assessment. The mission noted that while seasonal adjustment and statistical processing is SAS based and follows well-defined steps, a more graphical and interactive approach could provide greater flexibility in ensuring consistency of outputs and assessing impacts. The use of JDemetra+ (a freeware tool developed by Eurostat and now widely used in other international National Statistics Institutes as well as the South African Reserve Bank (SARB)), was demonstrated. The mission noted that expertise in JDemetra+ within Stats SA has increased in recent years, where this tool is now used for validation alongside the existing SAS processes.

6. When resources and expertise are limited, the use of robust and enhanced automated procedures can help mitigate resource challenges. During the mission, methodologists at Stats SA built a prototype R-shiny app using the rJDemetra toolkit, with the intention of trialing this to enhance the automation of bulk seasonal adjustment assessment procedures. This will allow additional time to focus on high-priority time series which impact published short-term and national accounts aggregate outputs. Continued development and use of R-shiny tool within Stats SA is recommended.

7. Seasonally adjusted estimates are impacted by real-world effects. The mission covered specific issues relating to both methods and practical approaches to seasonal adjustment best practice. This included a review of the treatment of Black Friday in Retail Sales estimates, the approach to prior corrections for the COVID-19 period and improving quality of volatile time series.

8. The application of prior corrections should follow the principle of parsimony, alongside consistency and coherence. Consistency and coherence between current and constant prices are crucial for the quality of seasonally adjusted estimates, particularly in the context of the relationship between value, volume and price. The implied price deflator will be impacted if the treatment between the current price and constant price seasonally adjusted data is inconsistent. Additionally, the principle of parsimony for the

application of prior corrections, is important to ensure the risk of over-adjustment is minimized. As an example, the mission reviewed the impact of COVID-19 based on the latest available data and guidance was provided to align to the principle of parsimony when considering prior corrections.

9. To support progress in the above work areas, the mission recommended an updated action plan with the following priority recommendations:

TABLE 1. Priority Recommendations

August 2026	*Ensure that the updated seasonal adjustment parameters are implemented as part of the latest rebased National Accounts estimates*	Stats SA
August 2026	*When applying prior corrections with the seasonal adjustment parameter settings, follow the principles of parsimony, consistency and coherence*	Stats SA
March 2027	*On a regular ongoing basis, assess the aggregate published seasonally adjusted estimates, particularly for QGDP, for evidence of residual seasonality*	Stats SA
March 2027	*Utilize the rJDemetra+ toolkit to develop automated bulk seasonal adjustment review processes*	Stats SA

10. Further details on the priority recommendations and the related actions/milestones can be found in the suggested work plan under Detailed Technical Assessment and Recommendations.

Detailed Technical Assessment and Recommendations

TABLE 2. Work Plan

Priority	Action/Milestone	Target Completion Date
***OUTCOME**: Seasonal adjustment approach for economic statistics*		
H	*Ensure that the updated seasonal adjustment parameters are implemented as part of the latest rebased National Accounts estimates*	8/31/2026
H	*Focus on harmonization principles with increased attention within the National Accounts*	1/8/2026
H	*Prioritize business output areas efficiently, based on their impact and importance for aggregate estimates*	3/31/2027
M	*Establish a rolling seasonal adjustment review cycle every 2-3 years*	12/31/2027
L	*Consider the sequencing and timing of the National Accounts benchmarking process to ensure adequate time for methodology*	12/31/2027

Priority	Action/Milestone	Target Completion Date
OUTCOME: Improvements for the seasonally adjusted QGDP series		
H	*Maintain the principles of parsimony and consistency as part of the seasonal adjustment application.*	8/31/2026
H	*Assess the SAS Thanksgiving regressor for Black Friday effects*	9/30/2026
H	*Stats SA to leverage on existing collaboration mechanisms with SARB to ensure there is consistency of approach with respect to the seasonal adjustment on labour market estimates.*	12/31/2026
H	*Formally evaluate JDemetra+ and rJDemetra.*	3/31/2027
M	*Investigate restriction of span application for prior corrections.*	3/31/2027
M	*Within the National Accounts area, develop and maintain an adjustment framework to ensure transparency and accountability.*	12/31/2027
M	*Issue revision policies for economic statistics publications in advance of release.*	12/31/2027
M	*Publish seasonally adjusted estimates for the Electricity dataset as part of the Quarterly Financial Statistics of Selected Municipalities to aid interpretation and understanding.*	12/31/2027
OUTCOME: Guidance and capability building		
H	*Undertake regular assessment for residual seasonality for the published aggregate seasonally adjusted estimates*	3/31/2027
M	*Update the existing seasonal adjustment guidelines*	3/31/2027
L	*Consider the formation of a time series expert user group to share experiences and build networks both within and externally with the South African Reserve Bank (SARB) for example*	12/31/2027
L	*Experts to provide seasonal adjustment training to business output areas to build both methodology capability in training and also enhance internal networks*	12/31/2027

A. SEASONAL ADJUSTMENT APPROACH FOR ECONOMIC STATISTICS

11. Stats SA compiles and publishes seasonally adjusted estimates for monthly and quarterly economic data as part of the short-term indicators and the quarterly National Accounts. Short-term indicators provide users with insights before the quarterly National Accounts are published. The mission discussed the following domains: manufacturing, mining, retail trade, motor trade, wholesale trade, accommodation, food and beverages, foreign trade (import and exports), inventories, capital expenditure, quarterly financial statistics of selected municipalities, and quarterly employment statistics.

12. Harmonization between the short-term indicators and the quarterly National Accounts data remains an important principle for Stats SA. It was recognized that there has been a noted improvement on this principle from the short-term production areas since previous missions (2019–2021), but it is

recommended for additional focus at a more detailed level from a National Accounts perspective. Ensuring the latest seasonal adjustment parameters are applied within the National Accounts will improve the quality of the National Accounts seasonally adjusted data, and harmonization will be increased when compared to the short-term estimates.

13. Prioritization is crucial when there are both limited resources and a large number of time series to seasonally adjust. The prioritization of data should be led by the business areas based on importance and also weight of the data to the aggregate domain estimates, including those used within National Accounts. This will help mitigate and effectively manage limited resources in the methodology area.

14. Seasonal adjustment parameters must be reviewed regularly to ensure they remain appropriate and that the quality of the seasonally adjusted estimates stays acceptable. To balance limited resources within the time-series area against the volume of series requiring review, a fully detailed review every year is not practical with current resources. Likewise, leaving a long gap between reviews, such as the proposed five-year cycle, risks the parameters becoming outdated. A compromise approach, with detailed seasonal-adjustment reviews every two to three years, would provide an acceptable balance and help manage the constrained resources available.

15. The updating of the benchmarks is a fundamental step in the update of the National Accounts. Stats SA follow a five-year National Accounts benchmarking timetable where all time series data are updated with the new annual benchmarks. The quarterly datasets are then updated to align to the new benchmark totals. This process can put significant pressure on the methodology area which has limited time to review all the newly created data. Consideration should be given to the National Accounts benchmarking process to enable adequate time for methodology to complete quality assurance of seasonal adjustment parameters. This could be achieved by the use of automated processing for seasonal adjustment updates, led from within the methodology time series area.

16. Transparency of seasonal adjustment parameters helps maintain and build trust in the seasonal adjustment process. Stats SA already follow best practice in publishing on their website detailed information on seasonal adjustment parameter settings. The mission noted that while it would be acceptable to publish less detail to provide some flexibility, both internal and external users are comfortable with the current approach.

Recommended Actions:

- *Stats SA should continue its focus on harmonization principles but with increased attention within the National Accounts.*
- *Stats SA business output areas to provide clear prioritization, based on impact and importance, of time series data so resources from the methodology area can be allocated efficiently.*
- *Stats SA to consider the sequencing and timing of the National Accounts benchmarking process to enable adequate time for methodology to complete quality assurance of seasonal adjustment parameters for the updated and prioritized benchmarked data.*
- *Stats SA to introduce a rolling approach to comprehensive seasonal adjustment reviews with no more than two-to-three-year period between full systematic reviews.*

B. IMPROVEMENTS FOR THE SEASONALLY ADJUSTED QGDP SERIES

17. The principles of parsimony, consistency and coherence are important principles in the application of seasonal adjustment. The principle of parsimony suggests that the number of prior corrections applied to an individual series should be kept to the minimum necessary to adequately capture identifiable effects. Excessive intervention can reduce model transparency and may adversely affect the stability of revisions. Consistency and coherence should be maintained, as far as practicable, across related

series. This is particularly important for linked measures such as current price and constant price estimates, where differing seasonal adjustment treatments may introduce distortions into derived series, such as the implied price deflators. Maintaining a coherent approach across related aggregates supports the overall interpretability and quality of the statistical outputs.

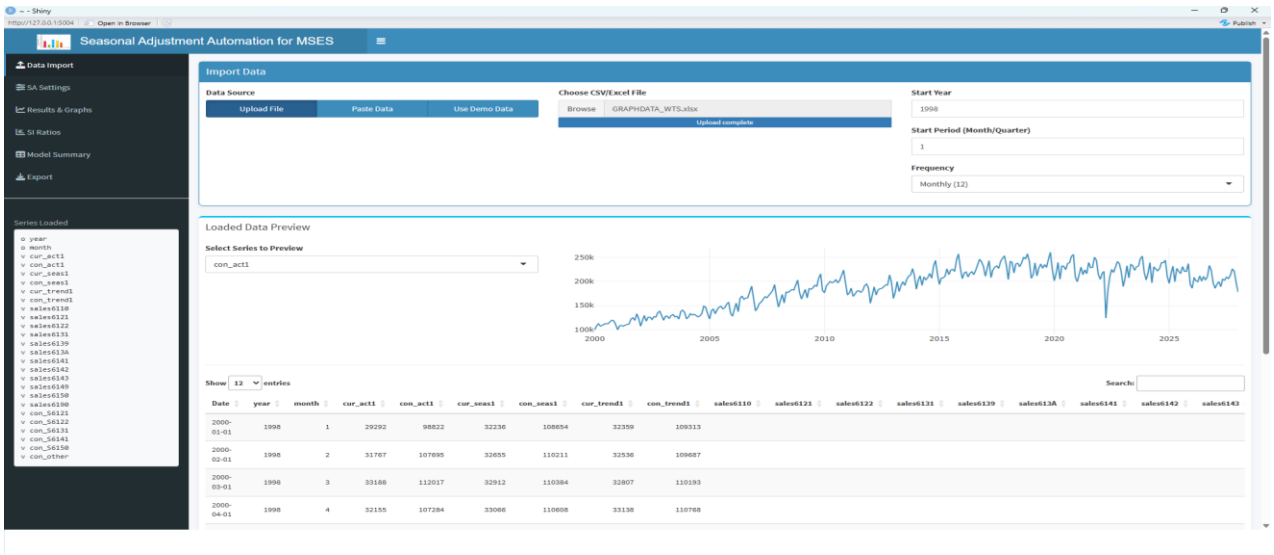
18. Seasonal adjustment model specifications should be mindful of the frequency of the data being adjusted. For quarterly time series, trading-day effects are often less prominent than in monthly series, but they should be tested empirically and included in the seasonal adjustment model only when they are statistically significant and economically meaningful.

19. The seasonal adjustment package currently used within Stats SA is PROC X12 with the SAS production environment, which has provided a stable and well-established operational framework. However, the increasing adoption of JDemetra+ across National Statistical Institutes provides a strong basis for evaluating its suitability as a future production platform within Stats SA. A formal assessment of JDemetra+ is therefore recommended, considering its widespread use within the official statistics community, its access to the latest implementation of X-13ARIMA-SEATS, and its ability to support alternative methodologies such as TRAMO-SEATS. Potential adoption of JDemetra+ would also facilitate alignment with evolving international practices in seasonal adjustment and strengthen comparability with peer statistical systems.

20. The use of a modern and flexible approach to seasonal adjustment can help provide efficiencies in production processes particularly where there are resource pressures. The mission further advocated for the more systematic use of JDemetra+, noting that while the software is free and widely used, its advantages over the existing PROC X12/SAS setup warrant clearer articulation and evaluation. JDemetra+ offers a modern interface, with an active user base and maintained platform, with integrated diagnostics, standardized workflows, along with transparent metadata structures that support reproducibility and auditability. These are features not readily available in the SAS environment. Its native implementation of both X-13ARIMA-SEATS and TRAMO-SEATS provides methodological flexibility beyond PROC X12, while its user interface and batch-processing capabilities reduce operational complexity for production teams. There are also sophisticated plug-ins available such as benchmarking procedures. Compared with other alternatives used internationally such as the standalone executables, or those in-built into SAS, JDemetra+ benefits from direct support from Eurostat and the European Statistical System regular updates, and harmonized documentation. The JDemetra+ software suite is a robust and future-proof option for Stats SA's seasonal adjustment operations

21. Any transition to a new production environment should be supported by a comprehensive evaluation of infrastructure, operational needs and business process workflows. A formal evaluation of JDemetra+ will ensure continuity of production and appropriate governance arrangements. Existing production processes would need to be reviewed, particularly on how seasonal adjustment parameter changes are passed between methodology and production areas. In parallel, opportunities to further automate the seasonal adjustment process should be explored. This may include greater use of bulk processing, automated diagnostics, and systematic model assessment procedures, allowing resources to be focused on the review of exceptional cases while improving efficiency, consistency, and reproducibility across a large number of time series. The rJDemetra suite of software is ideal for the automation of seasonal adjustment reviews. The mission noted excellent progress on this with an RShiny application built within the mission period.

FIGURE 1: Screenshot of a Prototype RShiny Application to Interface Into rJDemetra+



22. Where statistical tests support the application of seasonal adjustment, it should be applied to provide greater insight into the underlying data. For the Quarterly Financial Statistics of Selected Municipalities, the mission identified a clear and statistically meaningful seasonal pattern in the electricity series, indicating that seasonal adjustment would provide additional analytical value and improve the interpretation of quarter-to-quarter movements. Accordingly, the publication of seasonally adjusted electricity estimates is recommended. In contrast, the evidence for the water series is currently less conclusive, and additional observations would be beneficial to support the development of more reliable seasonal adjustment models. There is no impediment to proceeding with the publication of seasonally adjusted electricity data while noting that the seasonal adjustment of the water series remains under review pending the availability of further information and more robust estimates.

23. The seasonal adjustment of changes in inventories should be assessed on the basis of empirical evidence rather than conceptual considerations alone. While inventory movements can be volatile and may reflect irregular business decisions, they are also frequently influenced by recurring seasonal patterns associated with production cycles, agricultural harvests, retail activity, and inventory management practices. Where statistically significant and stable seasonality is present, seasonal adjustment can improve the interpretation of underlying economic developments by removing predictable seasonal fluctuations.

24. From a National Accounts perspective, seasonally adjusting changes in inventories may also contribute to greater coherence within the expenditure-based measure of GDP. The objective of seasonally adjusting change in inventories data is not to reduce genuine economic volatility, but rather to distinguish seasonal effects from underlying movements, thereby improving the analytical value of quarter-on-quarter comparisons. As with all series, the decision to seasonally adjust should be guided by diagnostic testing, the quality of the adjustment, and consistency with the treatment of related aggregates.

25. For the COVID-19 period, sufficient post-event data are now available to support a more informed assessment of the most appropriate intervention strategy. While there is no definitive treatment, based on evidence from a range of series, a combination of a Transitory Change (TC) and Additive Outliers (AOs) is generally considered an effective approach to capturing the abrupt disruption and subsequent adjustment associated with the pandemic. As an illustrative example, a TC may be specified in April 2020, together with AOs in March and April 2020. However, the exact specification should be determined on a case-by-case basis, reflecting the characteristics of the domain and individual series, and

the timing of observed impacts. Alternative intervention combinations may also provide an adequate representation of COVID-19 effects, although the use of extended sequences of AO is generally discouraged due to the risk of over-parameterization and reduced model stability.

26. From an operational perspective, the application of restricted outlier detection spans should be explored. The mission encouraged Stats SA to explore the possibility of applying options within PROC X12 to restrict the span used to detect outliers. Such approaches can help ensure that previously established historical corrections are not repeatedly reassessed during regular routine model updates, thereby improving the stability and consistency of seasonal adjustment outcomes.

27. A clear and well-documented revision policy is a fundamental component of high-quality National Accounts compilation. The policy should define the timing, scope, and communication of revisions, providing users with transparency regarding the circumstances under which previously published estimates may be amended. This is particularly important for seasonally adjusted data, where revisions arise not only from updated source data but also from the incorporation of new observations and the re-estimation of seasonal factors. A published revision policy helps manage user expectations, enhances confidence in the statistical system, and supports the interpretation of movements in key macroeconomic aggregates.

28. A transparent adjustment framework within National Accounts processing is crucial to manage quality of the data and understand impacts of the balancing of National Accounts. To complement the revision policy, it is recommended that the National Accounts area develop and maintain an internal adjustment framework governing the treatment of seasonal adjustment interventions, outliers, and other prior corrections. Such a framework should establish consistent principles and decision-making processes across time series, while documenting the rationale for adjustments and their expected impact on published estimates. A transparent adjustment framework will assist compilers in assessing the effects of interventions over time, promote consistency across related series, and strengthen the overall governance and quality assurance of the seasonal adjustment process.

29. From a quarterly National Accounts perspective, changes in the timing of monthly retail spending do not necessarily affect annual measures of household final consumption expenditure or retail output. However, they can have a material impact on the monthly distribution of economic activity and therefore on the interpretation of short-term economic developments. It is prudent to periodically review seasonal adjustment specifications to ensure that evolving retail practices are adequately reflected in published estimates. Appendix II provides a review of the treatment of Black Friday in the context of Retail Sales.

30. Understanding developments in the labour market is important for both macroeconomic analysis and policy formulation. In South Africa, quarterly labour market indicators are primarily compiled from two statistical sources: the Quarterly Employment Statistics Survey (QES), which measures formal non-agricultural employment and earnings from employer payroll records, and the Quarterly Labour Force Survey (QLFS), a household-based survey that measures labour force participation, employment, unemployment, and informal sector activity. These sources serve different statistical purposes and therefore produce estimates that are not expected to be identical.

31. From a National Accounts perspective, labour market statistics published independently do not need to be fully coherent with employment and compensation measures compiled within the National Accounts framework. Under the System of National Accounts (*SNA*), estimates of employment and compensation of employees are derived using a broader range of source data and are compiled to support the measurement of production, income, and productivity across institutional sectors and industries. Consequently, National Accounts estimates may incorporate benchmarking, balancing, conceptual

adjustments, and additional administrative or survey data sources that differ from those used in standalone labour market publications.

32. Consistent application of methods will provide coherence in the interpretation of labour market trends. The mission discussed labour market developments and seasonal adjustment practices with the South African Reserve Bank (SARB), including a comparison of methodological approaches applied to key labour market series. Although no official seasonally adjusted estimates are currently published for labour market time series based on either the QES or QLFS, the SARB independently disseminates a seasonally adjusted labour market series in its Quarterly Bulletin. This is important for prudent monetary policy, as seasonally adjusted indicators help to identify turning points in the labour market more reliably. As such, dissemination of official seasonally adjusted labour market indicators is important for Stats SA to consider.

33. Expanding the use of seasonally adjusted labour market indicators will improve the analysis of short-term economic developments and enhance consistency across macroeconomic statistics. At present, seasonal adjustment within the quarterly National Accounts is undertaken on a limited basis for components of Compensation of Employees used in the compilation process. Stats SA indicated that further development work is planned to extend seasonal adjustment to additional quarterly employment indicators sourced from the QES. An internal seasonal adjustment review project for QES and QLFS is currently underway within Stats SA conducted by Statistical Methods to review all the QES and QLFS variables for seasonality and to make recommendations on which variables should be seasonally adjusted and published as seasonally adjusted series. Given the importance of timely and reliable labour market indicators for assessing cyclical conditions and informing monetary policy, this work is becoming of increasing importance. The project should therefore leverage on the methodological work already undertaken at SARB to promote consistency and support the eventual publication of official seasonally adjusted labour market indicators.

34. Integration of labour market data sources can strengthen the quality and coherence of labour-related indicators used within the National Accounts framework. Internationally, National Statistical Offices increasingly combine business surveys, household surveys, administrative records, and benchmarking techniques to improve coverage of formal and informal employment, multiple job holding, and industry allocation. Such developments can support more comprehensive measures of labour input and productivity while maintaining the distinct analytical purposes of labour force statistics and National Accounts estimates**.**

Recommended Actions

- *Stats SA to maintain the principles of parsimony and consistency as part of the seasonal adjustment guidelines.*
- *Stats SA to initiate a formal evaluation of the use of JDemetra+ and rJDemetra for the application of seasonal adjustment reviews and automated processing, including quality checking.*
- Stats SA *time series area to investigate where a span restriction can be applied to ensure historical prior correction identification is effectively managed*.
- *Stats SA, within the National Accounts area, to develop and maintain an adjustment framework to ensure transparency and accountability within the compiler process.*
- *Stats SA to continue with developing clear and transparent revision policies for economic statistics publications and make these available in advance of the publication.*
- *Stats SA to publish seasonally adjusted estimates for the Electricity dataset as part of the Quarterly Financial Statistics of Selected Municipalities.*
- *Stats SA to leverage on existing collaboration mechanisms with SARB to ensure there is consistency of approach with respect to the seasonal adjustment on labour market estimates.*

- *Stats SA to make a more detailed assessment of the use of the in-built SAS Thanksgiving regressor, with appropriate parameter choice, and discuss further with impacted business areas before deciding how best to manage seasonally adjusted revisions if a different prior treatment for Black Friday is applied.*

C. GUIDANCE AND CAPABILITY BUILDING

35. Expertise in the application of seasonal adjustment is fundamental to the quality of the published seasonally adjusted estimates. Where possible, increased ongoing capability and capacity would be welcomed within the methodology area in general. While recognizing the significant organizational resourcing challenges within Stats SA, it was a promising development to see that priority was given to assigning interns to the methodology area dealing with seasonal adjustment.

36. Clear methodological guidance helps ensure that best practice and consistency is maintained in practice. Seasonal adjustment can be a subjective art, based on expertise, and also differ between practitioners. While there is no definitive agreed approach in practice, having clear guidelines can help ensure a degree of consistency in application. Appendix 1 provides a review of the current Stats SA guidelines. The IMF Quarterly National Accounts Manual[1] provides conceptual and practical guidance for compiling the QNA and includes chapters on seasonal adjustment in context of the National Accounts. Additionally, the European Statistical System guidelines[2] are written in an accessible format and provide guidance and acceptable methods on a wide range of topics.

37. Sharing experiences and learning from others can help build knowledge and capability. When resources are limited, one approach is to take a wider perspective and bring individuals on technical matters together. Stats SA should consider convening a regular time series user group which could meet to discuss and share practical problems and provide updates on time series issues, including the topic of seasonal adjustment and its application. To help ensure critical mass, this should be both from across the organization and also from other agencies like the SARB. This time series expert user group could meet quarterly or three times a year for two to three hours a time. It would help foster collaboration and build networks.

38. Providing training in complex topics can form part of capability building, both for the trainer and also the attendees. To enhance capability across the organization, consideration should be given to internal capacity building initiatives from the Human Resource Utilization and Development area (HRU&D) that seek expert-led opportunities for further training in seasonal adjustment. To help manage resource pressures, existing external online training could be secured and supplemented by methodology experts to also build internal capability on both presenting the content and the topic material on seasonal adjustment. In the present case the mission provided training both from a practical perspective and also utilized existing IMF material on seasonal adjustment.

Recommended Actions:

- *Stats SA to update the existing seasonal adjustment guidelines to include additional detail on topics such as use of AIRLINE model, quality checks for residual seasonality, and how often a detailed review should occur.*
- *Stats SA to enhance the exiting guidelines and introduce regular assessment for residual seasonality for the published aggregate seasonally adjusted estimates.*

[1] https://www.imf.org/external/pubs/ft/qna/
[2] https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/w/ks-gq-24-012

- *Stats SA to consider the formation of a time series expert user group to share experiences and build networks both within and externally, including the Reserve Bank.*
- *Stats SA HRU&D to provide for seasonal adjustment training to business output areas to build both methodology capability in training and also enhance internal networks.*

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Appendix I. Reviewing the Guidelines for Seasonal Adjustment

39. Organizational guidelines should be reviewed and updated regularly as best practice evolved. Stats SA currently maintains a detailed internal document outlining its seasonal-adjustment guidelines and principles, but it was last updated in 2017. Although an independent validation was completed in 2024, the document would still benefit from a further review and the inclusion of additional detail on the topics identified for improvement.

40. At a broad level, seasonal adjustment principles are broadly consistent across countries in practice but may differ in detail depending on either the domain or organizational needs. The StatSA guidelines cover the following topics and provide approaches relevant to the organizational context: pre-treatment of the time series (including decomposition, calendar adjustment, outlier detection and model selection); seasonal adjustment (including existence of seasonality); moving averages; revisions; quality measures (including diagnostics); metadata template; and presentation. Each section has more details available within the internal document.

41. Consistency of treatment for seasonal adjustment reviews forms a critical part of harmonization and reliable and repeatable processes. Stats SA have clear, well defined detailed guidelines for the process of seasonal adjustment. In 2024 an independent validation with Statistics Sweden occurred, of the current Stats SA seasonal adjustment guidelines, which has provided assurance of the approach given that both Stats SA and Statistics Sweden use SAS based methodology for seasonal adjustment. The mission noted that there could be enhancements to the current guidelines, which should include pre-screening of the data before adjustment, and additional diagnostics to monitor the quality of the aggregate seasonally adjusted estimates, such as regular residual seasonality checks.

42. Quality measures are a critical step in the production of seasonally adjusted estimates. Within the standard seasonal adjustment packages (X-13-ARIMA-SEATS, TRAMO-SEATS, and available within JDemetra+), there are a wide range of different quality measures. Within the Stats SA context, the quality measures often used are the monthly cyclical dominance (MCD); and the Q-statistics (as part of X-11 output). The Stats SA approach is clearly described within the guidelines, although in practice some degree of judgement by the analyst can often be necessary rather than rely solely on the outcome of the statistical test.

43. The practice of setting seasonal adjustment parameters can often require pragmatic choices. In practice, ensuring a quality seasonal adjustment outcome may require some pragmatic decisions. The deliberate setting of the AIRLINE model can often help obtain a suitable seasonally adjusted output, particularly where either no suitable automatic model can be found, or the quality metrics may be borderline.

44. Residual seasonality assessment is a fundamental quality test for aggregate seasonally adjusted estimates. Typically, seasonal adjustment is applied at a detailed and disaggregated level, and then indirect seasonally adjusted aggregates are created. The indirectly derived aggregates can also then include statistical processing such as additional benchmarking or adjustments. Separately, there is an alternative approach where direct seasonal adjustment is applied to the aggregate estimates. Stats SA follow an indirect approach to seasonal adjustment.

45. Quality tests on the indirect seasonally adjusted estimates should be applied as part of routine production. There should be no residual seasonality in published aggregate time series. Recent work (2026) by the Office for National Statistics (UK)[3] discuss this issue in detail and suggest to focus on

[3] https://www.ons.gov.uk/economy/grossdomesticproductgdp/methodologies/howtheonsassessesstatisticaloutputsforresidualseasonality

two tests that should be performed before publication. Both tests (QS and model-based F test) are available within the X-13-ARIMA-SEATS (and also JDemetra+) outputs. The United States Bureau of Economic Analysis have had a detailed focus on this topic in the past (2018), and the UK approach follows similar analysis.

46. The inclusion of these two tests within the StatSA guidelines would help ensure that the quality of indirectly derived seasonally adjusted estimates are assessed appropriately before publication. The mission tested the aggregate indirect constant and current price seasonally adjusted data for GDP. Based on the tests applied there was no statistically significant residual seasonality, although continued close monitoring, particularly on the constant seasonally adjusted estimates, is recommended.

47. The diagnostics for the aggregate current price seasonally adjusted GDP series show no indication of residual seasonality. As shown in Table 3, the QS test produced a value of 0.0000 (p-value 1.0000) and the model-based F-test returned a value of 1.1284 (p-value 0.3403). Both results lie well above conventional significance thresholds, confirming that the indirect seasonal adjustment approach, as applied to the current price series, is adequate and does not introduce unintended significant seasonal patterns at an aggregate level.

48. The diagnostics for the aggregate constant price seasonally adjusted GDP series exhibit slightly higher test statistics. This is particularly evident in Table 3 for the model-based F-test (value 2.2953; p-value 0.0811). Although still above the five percent significance threshold, this result is closer to indicating potential residual seasonality than the corresponding current price tests. This supports the mission's recommendation for continued close monitoring of the constant price seasonal adjustment process and the routine application of these diagnostics both in a quarterly publication context, but also within Stats SA's seasonal adjustment review cycle.

TABLE 3. Assessment of Residual Seasonality in the Aggregate GDP Estimates

	Autocorrelations at seasonal lags (QS test)	Model based F-test (seasonal dummies)
Aggregate GDP: Current price seasonally adjusted data	Value: 0.0000 (p-value 1.0000)	Value 1.1284 (p-value 0.3403)
Aggregate GDP: Constant price seasonally adjusted data	Value: 1.8215 (p-value 0.4022)	Value: 2.2953 (p-value 0.0811)

Tests performed using JDemetra+ v3.7.1 based on published seasonally adjusted GDP data, and following the principles outlined in "How the ONS assesses statistical outputs for residual seasonality" (12 May 2026), https://www.ons.gov.uk/economy/grossdomesticproductgdp/methodologies/howtheonsassessesstatisticaloutputsforresidualseasonality where X-13-ARIMA-SEATS with appropriate choice of prior correction treatment is applied to the already published seasonally adjusted data. The test results are found in Diagnostics / Seasonality tests / Linearized series and test 1. and 6. where significant test results would indicate the presence of residual seasonality.

Appendix II: Reviewing the Treatment of Black Friday in Retail Sales

49. Black Friday, and its impact on retail trade statistics, has become increasingly widespread in South Africa since the early-to-mid 2010s. The mission discussed the impact of Black Friday for retail trade statistics and seasonal adjustment. It was acknowledged that in more recent times, that Black Friday, and related promotions, have been normalised for their impact on household expenditure and retail sales activity.

50. Due to the Black Friday timings, retail purchases that previously occurred in December can often be brought forward into late November to take advantage of promotional discounts. Consequently, monthly retail trade statistics may exhibit changing seasonal patterns over time, particularly in industries associated with discretionary consumer spending. These developments can complicate the interpretation of short-term movements in retail activity and may reduce the effectiveness of seasonal adjustment models that assume relatively stable seasonal behaviour.

51. There are a range of options to account for the timing of Black Friday as part of seasonal adjustment. The mission discussed previous outcomes, where in 2020 the recommended approach within the Stats SA context was to modify the seasonal filter parameter for that particular month (see Section 8.6 in the European Statistical System seasonal adjustment guidelines[4]). This was implemented successfully and has continued to be used. However, as additional data becomes available, it is best practice to review the existing methods.

52. International statistical experience suggests that there are a range of acceptable methods to account for the timing of Black Friday. The Australian Bureau of Statistics (ABS) historically implemented seasonal breaks in selected retail series and highlighted the need for ongoing monitoring as seasonal patterns continue to evolve. ABS analysis (2024)[5] notes the range of options, which include, applying a seasonal break, use of a bespoke regressor, seasonal filter change for specific month, or just continued assessment and monitoring. Recent research from Statistics Sweden (2026)[6] similarly identified challenges and demonstrated that the inclusion of specific explanatory variables within RegARIMA models can significantly improve seasonal adjustment outcomes for retail sales statistics.

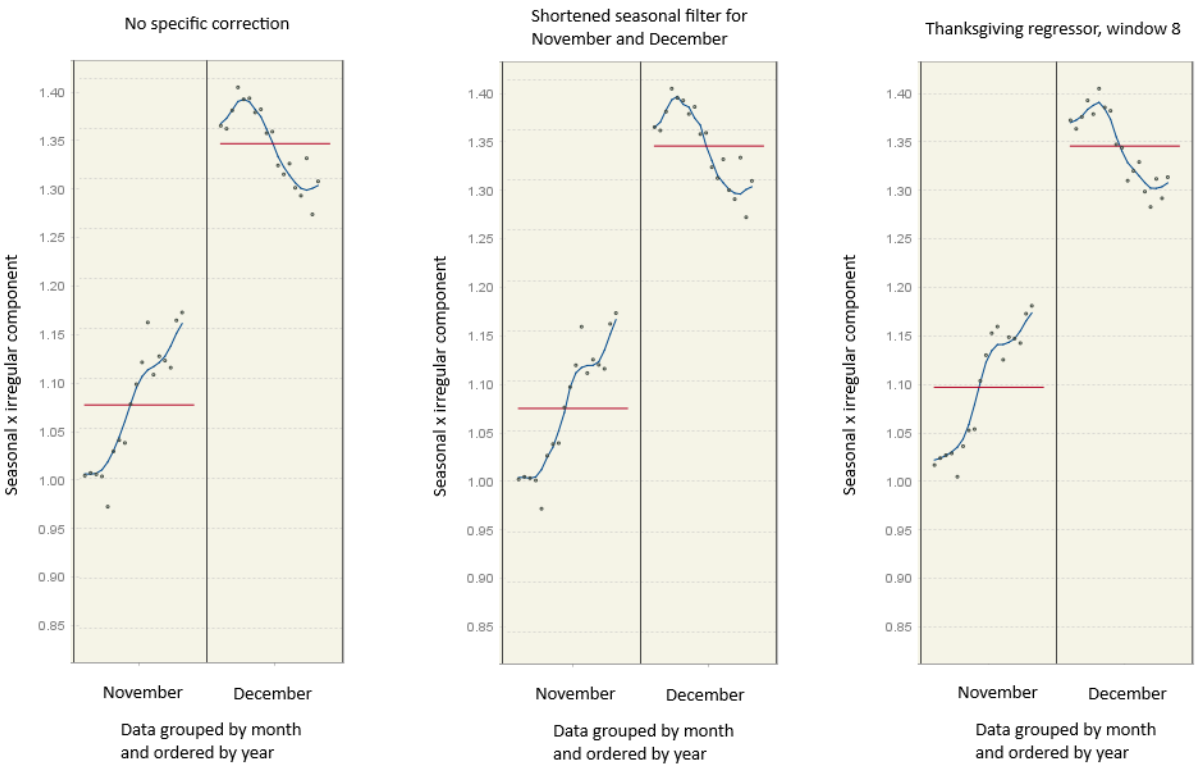
53. Black Friday exhibits characteristics similar to other movable calendar-related effects that are already treated within standard seasonal adjustment frameworks. In particular, the Black Friday event occurs relative to the United States Thanksgiving holiday which is celebrated annually on the further Thursday of November. Seasonal adjustment software, as used by Stats SA (e.g. proc x12 in SAS), includes a built-in Thanksgiving regressor designed to model the impact of activity associated with the Thanksgiving period. While originally developed for United States economic statistics, the underlying methodology provides an approach to capture Black Friday-related effects in retail trade data once suitable parameters are chosen. The mission noted that a parameter range for the impact window should be between +1 to +8. The statistical significance and stability of the observed impacts can be tested and compared with existing practice. While X-13ARIMA-SEATS includes a dedicated Thanksgiving regressor for modelling movable retail effects associated with the Thanksgiving period, equivalent functionality within JDemetra+ would generally require the construction of a user-defined regressor**.**

[4] ESS Guidelines on seasonal adjustment – 2024 edition - Manuals and guidelines - Eurostat
[5] https://www.abs.gov.au/articles/changes-seasonality-retail-turnover
[6] https://journals.sagepub.com/doi/epdf/10.1177/18747655261442072

54. As an example, the chart on the left below shows the default impact, with no correction applied, for a selected monthly constant price Retail sales series. In this series (monthly constant price S621C with data from September 2024 to February 2026) the seasonal factor shows clear evolution within November and December. This is illustrated by the seasonal factor (blue line) moving rapidly up in November, and down in December. The seasonal and irregular component is represented as the dots. Changing the seasonal filter used in both November and December to be shorter gives the chart in the center. By using a shorter filter (3x1) instead of the default seasonal filter (3x3) options, the seasonal factor shows slight improvement for December. The chart on right shows an alternative approach using a Thanksgiving regressor (with window of 8 and applied in JDemetra+)[7]. In this example, the use of the Thanksgiving regressor shows greater impact.

55. Regular monitoring of impacts that can continue to evolve will help ensure quality is maintained. As impacts evolve over time, the seasonal factor can adapt. The mission noted that analysis of the Thanksgiving approach is an alternative approach to the existing approach of shortening the seasonal filter. Regular diagnostic analysis of seasonal adjustment models, including assessing parameter choices, can help ensure that seasonally adjusted estimates remain a reliable indicator of underlying economic activity and support the quality of quarterly National Accounts compilation.

FIGURE 2: Example of impact for different treatment for Black Friday on the seasonal and irregular component for monthly retail constant series S621C



[7] There is no in-built Thanksgiving regressor within JDemetra+, the genhol package in R (R: Generate Holiday Regression Variables) can be used to create an equivalent regressor to that available in X-13-ARIMA-SEATS or SAS. The options used in this example to illustrate the impact were: genhol(thanksgiving_dates, start = 0, end = 7, center = "mean"). The regressor can then be loaded into JDemetra+ as a user-defined regressor.