Statistics Commission

REPORT OF A SCOPING STUDY ON SEASONAL ADJUSTMENT METHODS AT THE OFFICE FOR NATIONAL STATISTICS

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Report of a Scoping Study on Seasonal Adjustment Methods at the Office for National Statistics

A report prepared for the Statistics Commission, by Kenneth F Wallis

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Introduction

1. This report to the Statistics Commission presents the results of its first externally commissioned scoping study. The study assesses whether, prima facie, a useful purpose would be served by a substantive study of seasonal adjustment procedures used at the ONS, taking account of recent and planned internal quality assurance work in this area.

2. The specification for the scoping study is attached at Annex A. The method of working and timing were as described in paragraphs 7-9 of the specification. The "overview report" referred to in paragraph 8, the *Seasonal Adjustment Stewardship Report* by Simon Compton, Head of the Time Series Analysis Branch, is attached at Annex B. Other documents consulted and referred to below include the *National Statistics Work Programme 2001/2 to 2003/4* and the *ONS Business Plan* for the same period. The assistance in this study of Simon Compton and other ONS staff is gratefully acknowledged.

Seasonal adjustment procedures

3. Seasonal adjustment is a process of estimating and removing the more-or-less regular seasonal pattern that occurs in many monthly and quarterly time series. It is applied to several thousand series produced in the ONS, to help users interpret their underlying trends. The concepts of trend, seasonal and irregular components on which the process is based lack universally applicable, agreed definitions, however, hence the seasonal adjustment problem is itself not well-defined. In consequence seasonal adjustment computer programs which may appear mechanical should not be applied mechanically; good adjustment requires intelligent monitoring of their use. Their operations can be divided into three phases. In a first "pre-adjustment" phase the data are corrected for known trading-day and calendar effects, if any, and their time-series characteristics studied so that the central seasonal adjustment method can be tailored to the behaviour of the particular series - does the seasonal peak represent a constant absolute increase or a constant proportionate increase, how stable is the pattern, how noisy is the series, and so forth. Having made appropriate choices the seasonal adjustment method can then be applied in a second, more mechanical, phase. This comprises a sequence of moving average and smoothing calculations to separate the components, and the choices concern such matters as the length of the moving averages - how many June observations to average, and how to get a reliable estimate of the current June effect, for example. Finally, in an evaluation phase, the quality of the adjustment can be assessed using a range of statistical measures and graphical techniques, collectively referred to as diagnostics. In both pre-adjustment and post-adjustment phases subject-matter knowledge is important - what activity is being measured, how are the data collected - especially when changes occur in data collection and institutional and fiscal arrangements relevant to the activity in question. And, of course, a conclusion of the evaluation phase may be that some of the settings could have been better chosen, and so the whole cycle is repeated.

4. The first computer program for seasonal adjustment was introduced in 1954 by the US Bureau of the Census, which has stayed at the forefront of technical development in the area ever since. Its "X-11" method followed in the 1960s, and this method and its descendants are the most widely used programs in national statistical offices. The program currently used throughout the ONS (with one exception, noted below), also in other government departments, is X-11-ARIMA/88. This is an extension of X-11, developed at Statistics Canada, which improves estimation at the end of a series by fitting an autoregressive-integrated-moving average (ARIMA) model to the series and using it to extend the observed series by forecasts of future values before applying the X-11 method. (An alternative way of doing this was developed in the Research and

Special Studies Division of the Central Statistical Office in the late 1970s - see Kenny and Durbin (1982) - but was not widely adopted.) This device reduces the revisions that are required to the initial seasonal adjustment of the current observation as time goes by and later observations become available that permit improvements to that initial adjustment.

5. Subsequent research and development work in the Statistical Research Division of the Census Bureau, aided by suggestions from seasonal adjustment experts in several national statistical offices, including the UK, led to the recent release of X-12-ARIMA (Findley *et al.*, 1998). It retains the general approach of X-11 and X-11-ARIMA to the central seasonal adjustment calculations, with several enhancements, while making major improvements to the pre- and post-adjustment phases. It is the new industry standard, freely available via the Internet, and its possible implementation at the ONS is considered below.

6. An alternative approach to that of the Census Bureau X-11/X-12 family is provided by so-called "model-based" methods. These supply the missing formal definition of the problem by postulating models in the ARIMA class for the underlying components of a series, together with a criterion of optimality. In this framework standard statistical procedures then provide not only the "best" seasonal adjustment but also associated statistical inference, such as confidence intervals for the estimated seasonal factors, conditional on the chosen model. Model-based methods have considerable theoretical appeal, and there is a large literature on the comparative properties of the two approaches. Comparisons have also been undertaken at a more practical level, for example by working parties/task forces at the Bank of England (1992) and the European Central Bank (2000) - each with representation from the CSO/ONS. The latter report does not recommend replacing X-12-ARIMA with the model-based method (TRAMO-SEATS) considered, rather it seeks the further incorporation of some features of the model-based method into X-12-ARIMA, which is indeed on the agenda of the Census Bureau's Statistical Research Division. Reservations among practitioners concern the difficulty of identifying good models for some series, and the robustness of model-based adjustment and associated statistical measures of its quality to occasional model failures.

The current organisation of seasonal adjustment

7. For some time the Time Series Analysis Branch (TSAB), part of the ONS Methodology Group, has had general responsibilities in the area of seasonal adjustment, such as monitoring technical developments, setting standards, documenting and disseminating them, and training and advising practitioners. (These also extend to other government departments who produce, adjust and publish approximately one-third of the seasonally adjusted National Statistics.) These were increased by transferring responsibility for the *quality* of seasonal adjustment in the ONS to TSAB with effect from 1 April 2000. This had previously rested, along with responsibility for the quality of all other aspects of their statistical outputs, with the subject area statisticians in the various production branches. However, a programme of seasonal adjustment quality audits conducted by TSAB in 1999 had found that the quality was very variable, and the revised arrangements were introduced in order to improve this situation. To help meet its increased responsibility, the staff of the branch was increased from four to nine. The real-time operation of seasonal adjustment remains in the hands of the production branches, with the X-11-ARIMA system embedded in their various IT environments.

8. Under the new arrangements annual reviews of seasonal adjustment are carried out by TSAB, working closely with the subject area statisticians, and the first annual round (2000/2001) has recently been completed. A report has been produced on this

"seasonal adjustment re-analysis" in each of the 26 subject areas in which seasonal adjustment is carried out in the ONS, and some general lessons from these exercises, including priorities for the next annual round, are described in the overview report (Annex B). In the re-analysis work TSAB has taken advantage of the additional capabilities available in X-12-ARIMA in both pre-adjustment and post-adjustment phases. In some subject areas the specific circumstances require other pre-adjustments to be made, and the reasons for this and the actions taken have been documented. (Note. Careful readers of re-analysis report SA020 on RPIY and the article by Baxter (1999), a former head of TSAB, will notice that X-12-ARIMA was introduced into the production of SARPIY: this is the exception to the use of X-11-ARIMA/88 mentioned in paragraph 4 above.)

Future developments

9. Developments in two areas are relevant to this study. The first concerns the ONS information technology upgrade described in its *Business Plan 2001-02 to 2003-04*. The objective of an integrated, enterprise-wide statistical and technological infrastructure is relevant to the question of upgrading seasonal adjustment from X-11 to X-12, because an integrated system facilitates such an upgrade, in contrast to the present disparate collection of IT systems which are not harmonised across the ONS. Three "reasonably distinct phases to the developments" are identified in the Plan, the second involving "the re-engineering of the most significant statistical processes", which could be interpreted as including a seasonal adjustment upgrade. These phases are not timetabled, although the "Reinforcing statistical infrastructure" portfolio, one of several Business Strategy Portfolios described in Annex B of the *Business Plan*, has as a key milestone the agreement by November 2001 of a methodology development work programme for National Statistics for the coming three years.

10. The quality assurance processes for National Statistics described in the *National Statistics Work Programme 2001/02 to 2003/04* are the second development of relevance to this study. The strategy for quality assurance includes a programme of thorough reviews of key outputs every five years, and an initial proposal for a Quality Assurance Review Programme is set out in the Annex to the *Work Programme*. This is structured by twelve "themes" or broad subject areas, and also includes "cross-cutting" reviews which may be methodology based, with the example being given of the use of seasonal adjustment techniques. For the majority of the themes a provisional five-year programme of reviews is presented, whereas only one cross-cutting review is scheduled, concerned with statistics relating to questions of inequality.

11. Further elements of quality assurance concern documentation - of the processes used to produce National Statistics outputs, and of the quality attributes of those outputs. The *Work Programme* anticipates that the StatBase system will be developed to bring together such documentation and make it available to users of the Internet.

Discussion

(a) Recent developments

12. The adoption of a single standard method of seasonal adjustment across the Government Statistical Service has brought many advantages, as noted in the overview report. It achieves coherency in standards and concepts across seasonally adjusted outputs, and a common framework facilitates communication, documentation, dissemination, training, methodological development and quality assurance.

13. The division of responsibility between TSAB and the production branches is a sensible one, with TSAB providing expert technical input through the systematic re-analysis programme and occasional trouble-shooting, while "ownership" is retained by the production branches, for whom seasonal adjustment is but one of many concerns. The recent re-organisation appears to enjoy the confidence of the production branches, and represents a further step towards restoration of a sound methodological foundation for National Statistics.

14. The quality assurance work represented by the systematic re-analysis programme is itself of good technical quality and has achieved substantial improvements in documentation. The kinds of problems that arose in the first round of re-analyses are familiar in the seasonal adjustment literature, and the re-analysis reports describe solutions for most of them in the sense that a framework for handling them has been put in place, rather than that they have gone away for ever. These include such matters as the improved choice of options in X-11-ARIMA, strategy towards revisions, the treatment of adding-up and balancing constraints, and the handling of interventions and shifts of various kinds, whether one-off, intermittent or permanent. Here the message is that the reason for intervention should always be made clear, and what was done and why should be documented: for an example in which the impact of a change in fiscal policy on seasonality was not so well appreciated in-house see Sumner (1984).

15. Dissemination issues concern (at least) three audiences: government statisticians, users of National Statistics, and a wider professional audience. The first audience is now better served, thanks to improvements in documentation. These in turn bring potential improvements for users of National Statistics closer to hand, as noted in the paragraph on "Transparency to users" in the overview report. Some subject areas are already better served than others in this respect. The monthly *Labour Market Trends*, for example, publishes in its Technical Reports section articles on the annual reviews of seasonal adjustment of its main series, together with other occasional articles on related methodological developments, and other "Themes" might follow suit. With respect to the professional audience, while occasional articles on contracted-out research appear in professional journals (Steel, 1997, and Harvey and Chung, 2000 are recent examples), CSO/ONS staff have had a much lower profile than members of the Statistical Research Division of the US Bureau of the Census, for example, over the last two decades.

(b) Future developments

16. The immediate question "is to decide whether and when to introduce X-12-ARIMA as a new standard package", in the words of the overview report. Whether is scarcely a question: the new package *is* the new industry standard being adopted elsewhere, and is the generally accepted vehicle for future methodological developments in seasonal adjustment. As for when, the upgrade would be most conveniently implemented once a harmonised IT infrastructure is in place. It could be seen as part of the second-phase re-engineering of significant statistical processes described in the *Business Plan*. The period of the first phase of infrastructure development allows time for preparation of the implementation of the upgrade, so that it can be accomplished without interruption to real-time production processes.

17. The upgrade also relates to the international dimension of National Statistics by contributing to European harmonisation of statistics. Although there are substantial differences among EU members in data collection methods in important areas of economic statistics, the adoption of common procedures in such areas as seasonal adjustment helps achieve harmonisation of outputs.

18. Continuation of the programme of systematic annual re-analyses of seasonal adjustment is a major contribution to continued quality assurance in this area. This

programme might itself be reviewed as a "cross-cutting" review forming part of the five-year Quality Assurance Review Programme described in the *Work Programme*. In view of possible developments discussed above this might be scheduled in the later part of the current five-year plan.

19. The Statistics Commission's interest in the extent to which National Statistics assesses and communicates information about the reliability of its figures has a bearing on seasonal adjustment procedures, by virtue of the process of revision that occurs over time in the seasonally adjusted figure for a given month or quarter. Regarding the concurrent preliminary adjusted value as an estimate or forecast of the final adjusted value that will emerge once the revision process is complete, measures of the forecast error might be developed to give users an indication of the likely magnitude of the revision. Unexpected revisions from whatever source undermine confidence in the statistics, and little is known about the relative magnitude of revisions from various sources in different series. The revisions-history diagnostics in X-12-ARIMA are a good place to begin study of the revisions that arise from improved seasonal adjustment as more data become available, with a view to developing such measures.

(c) Conclusion

20. In view of the findings of this brief study, including the actual and potential developments identified above, it is concluded that little of additional use would be achieved by a substantive study at the present time, and therefore that there is not a case for further investigation. Comments on this study's method of working (Specification, paragraph 11) are submitted separately and not included in this Report.

Recommendations

21. It is recommended that

(i) the Statistics Commission does not proceed to a substantive study of seasonal adjustment procedures used at the ONS at the present time;

(ii) in the course of commenting on the arrangements for promoting professional standards across all official statistical work, and in particular on the *National Statistics Work Programme* and *ONS Business Plan*, the Statistics Commission seek a specific commitment to the seasonal adjustment upgrade described above, and a timetable for its implementation;

(iii) in the course of commenting on the quality assurance processes of National Statistics, the Statistics Commission monitor the annual seasonal adjustment re-analysis programme, if necessary with the assistance of expert advisers and referees;

(iv) the Statistics Commission return to the question of a further brief study or a more substantive study in this area after a "cross-cutting" review of the use of seasonal adjustment techniques has been conducted as part of the five-year Quality Assurance Review Programme for National Statistics; if such a review is not scheduled as part of the five-year Programme, the Statistics Commission should return to this question after three years.

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Annex A
To Prof Wallis' report

HM TREASURY-STATISTICS COMMISSION

SPECIFICATION FOR SCOPING STUDY ON SEASONAL ADJUSTMENT METHODS AT THE OFFICE FOR NATIONAL STATISTICS

BACKGROUND

1. The Statistics Commission has been set up to advise on the quality, quality assurance and priority setting for National Statistics, and on the procedures designed to deliver statistical integrity, to help ensure National Statistics are trustworthy and responsive to public needs. It is independent of both Ministers and producers of National Statistics. As part of its quality assurance role it will be seeking to commission pieces of methodological audit and other work from academic and other experts to inform its judgments.

2. It is still testing out different ways of working but intends that its choice of areas for substantial pieces of work should be informed by initial "scoping studies" which will assess the case for further work and provide clear terms of reference for the main studies. Some of these will be undertaken by its own small secretariat and some by external experts. It is envisaged that all the scoping studies will be published, perhaps as a series of occasional papers, in line with the Commission's commitment to work openly and transparently.

3. This note sets out the brief for the first externally commissioned scoping study on *Seasonal Adjustment Methods at the Office for National Statistics*.

PURPOSE OF STUDY

4. The scoping study shall assess whether, prima facie, a useful purpose would be served by a substantive study of seasonal adjustment procedures used at ONS. It shall consider whether the techniques used seem appropriate to their circumstances and are properly documented and whether the technical staff understand the different methods and the reasons for their choice. The requirement is for a general but authoritative judgement of this and not a detailed assessment.

5. The study shall also take account of recent and planned internal quality assurance work in this area.

6. If the report does conclude that there is a case for further investigation, it should give an estimate of the time that would be required to do this thoroughly and guidance as to the issues which would need to be addressed. The Commission would then put the main study out to tender.

METHOD OF WORKING AND TIMING

7. The study is expected to take no more than five working days including writing up. The following paragraphs set out a suggested approach but we are willing to consider other proposals, for different approaches. If, in the opinion of the contractor, this work cannot be fully completed within five days, the contractor is required to confirm the total number of days required prior to any extra work commencing.

8. The ONS is in the process of implementing the recommendations of an internal review, including producing revised documentation of all series. This will be completed by end March 2001 and the documentation along with an overview report prepared by the lead statistician who is coordinating the exercise, will be available to the consultant by 4 May. The documentation will consist of a set of 20 reports of varying length but averaging about 15 pages and can be made available as bound paper reports or electronically in Word.

9. The scoping study will be initiated by a meeting in early May between the consultant, a representative from the Commission and key players from ONS following which the consultant will:

- scrutinise (probably on a sample basis) the documentation described above
- interview the lead statistician and a small sample of business area statisticians
- formulate conclusions and prepare a report.

The report shall be completed, and delivered to the Statistics Commission by 15 June.

OUTPUTS

10. The Commission is seeking a report covering the points identified in paragraphs 4-6 above. It need not be long, around 3000 words are envisaged, but a shorter report would be perfectly acceptable if it covered the ground. What is important however is that it should be suitable for publication as envisaged in paragraph 2 above. The report should be presented in hardcopy and also in electronic form (preferably Word format; we should be advised of another format before its use).

11. We are developing our methods of working and we would also welcome any advice on whether this approach (a five-day scoping study) has seemed a sensible way to proceed. This is not however part of the requirement.

CONTACT POINTS

12. Any enquiries about this brief or about the general context should be directed to Gill Eastabrook (chief executive on 020 7273 8000) at the Statistics Commission. Contact with ONS can be made via Stephen Penneck (head of National Statistics and Policy Division on 020 7533 6202).

Statistics Commission
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Annex B
To Prof Wallis' report

Seasonal Adjustment Stewardship Report

INTRODUCTION

This document gives an assessment of the current standard of seasonal adjustment in the ONS following completion of the first year of systematic seasonal adjustment re-analyses. It lists outstanding concerns and sets out the priorities in terms of methods and datasets for the next year of reanalyses as well as outlining key improvements which will be made to the process of re-analysis itself.

BACKGROUND

Responsibility for the quality of ONS seasonal adjustment was given to Time Series Analysis Branch (TSAB) on 1 April 2000, following the findings of the seasonal adjustment quality audits and subsequent discussions about how best to achieve and sustain good quality seasonal adjustment across the Office. The main practical difference this change has brought about is that annual re-analyses of seasonal adjustment are now conducted by TSAB rather than subject area statisticians. However, these statisticians retain overall responsibility for the quality of their statistical outputs. The results of TSAB's re-analyses therefore have to be agreed and signed off by both parties prior to any changes to the seasonal adjustment being implemented.

There are currently 26 subject areas in which seasonal adjustment is conducted in the ONS and all of these areas have been analysed between April 2000 and March 2001. The re-analyses have been based upon a standard process involving the following key steps:

i. kick-off meeting - with the subject area statisticians in which objectives for the re-analyses are agreed and key priorities and issues are raised and discussed;

ii. analysis – during which TSAB members analyse the series, working closely with host branch statisticians to understand the series and discuss the analysis;

iii. presentation – towards the end of most re-analyses a presentation has been given, communicating the findings of the re-analysis and raising outstanding issues for discussion to host branch members and other people with an interest in the dataset in the ONS;

iv. report – writing up the findings and recommendations of the re-analysis. Each report contains a brief description of the dataset, its data sources, structure and use, together with a formal specification of the seasonal adjustment, on-going monitoring procedures and priorities for next year's re-analysis.

A complete set of 26 reports, agreed with the business areas, was completed. Nearly all the series seasonally adjusted within the ONS were individually analysed; several thousand in total. For some datasets where a very high number of series are adjusted only some series were looked at this year (e.g. monthly series for overseas trade in goods broken down by trading partner country have been left for next year).

The role of TSAB in seasonal adjustment extends beyond the re-analyses. The branch monitors and evaluates the development of new methods for seasonal adjustment and represents the ONS in European meetings on harmonisation. The branch also has a training and advisory function across government. A one and a half day training course is run several times a year to ensure that those dealing with seasonally adjusted data have an understanding of what it is, why and how we do it, and key issues associated with it. The course includes practical as well as theory sessions. The advisory role also extends to the provision of guidance manuals and the operation of a telephone Help Desk.

RESULTS OF THE ASSESSMENT

The branch has found the seasonal adjustment already in place to be very mixed in quality, confirming the main finding of the seasonal adjustment quality audits. A large amount of work has been done to improve quality over all the datasets during this year's re-analyses and the year has been particularly productive in documenting the existing seasonal adjustments, including reasons for interventions, and in solving or documenting problems with straightforward solutions. We end the year with a large body of work for the coming year, but with clear progress having been made both in terms of quality improvements already achieved and better identification of key priorities for the future.

There remain some areas where the quality of the seasonal adjustment is still weak. However, these areas tend to be the ones in a state of flux, with systems and data changes expected during the next year. It would therefore not have been sensible to invest heavily in improving their seasonal adjustment over the past year; they are all high priority datasets for the coming year (see below).

The following set out an overall assessment of these facets of seasonal adjustment quality:

i. technical application of the method;
ii. coherence;
iii. documentation;
iv. user transparency.

Technical Application of the Method

The choice of X11-ARIMA as the standard method for seasonal adjustment does not mean that the process itself becomes prescriptive. The program automatically chooses filter length and has options that test for and automatically adjust for trading day and Easter effects. The choice of ARIMA model employed for producing forecast extensions is also automatically made. However, it is often the contextual issues around the seasonal adjustment, from the choice of which series to seasonally adjust in the first place, to using knowledge about data sources, structures of datasets, the behaviour of

series and the way in which the data are used, to inform the setting up of parameters, which have the biggest quantitative impact on adjustment. It is this tailoring of the seasonal adjustment which constitutes much of the value added by the work of TSAB during the re-analyses. Indeed, it is TSAB's role to specify all these parameters during the re-analysis, in consultation with subject area statisticians, before the subject areas implement them in their production systems.

A key priority for this year's round of re-analyses was to identify which series are being seasonally adjusted throughout the Office, to run them through the software and to ensure that the standard options are set up correctly for all series. At the same time, series were graphed and outputs were checked so that any obvious distortions caused by, for instance, large level shifts or seasonal breaks in the series were investigated and appropriate interventions made and documented.

Some more complex problems with specific datasets were documented this year and will be followed up in future re-analyses and projects.

Coherence

Seasonal adjustment is done using standard software and is specified by the same small group of specialist staff for all datasets across the Office. It is therefore 'coherent' in a very fundamental sense of all being produced under a common method and approach. However, it has become clear during this year's re-analysis that there is more work to be done on coherence, particularly in the area of national accounts where the complex inter-dependencies of data and relationships between them are not fully taken into account in the seasonal adjustments being done. Improving coherence across the accounts is a key challenge for the coming year.

Documentation

A key objective for all re-analyses this year was to document current practice. We therefore now have comprehensive detailed documentation about all seasonal adjustment across the ONS.

Transparency to users

The exact methods, parameters and strategies for seasonal adjustment used by the ONS are not currently transparent to users; it is currently not possible for users to replicate our seasonal adjustment. However, development of centralised documentation and harmonisation of approach to seasonal adjustment across the Office draws us nearer to being able to do this. Again, a move to X12-ARIMA, which is freely available on the Internet, would help facilitate this. X11-ARIMA is currently only available under licence and the version used by the ONS is slightly different to the one currently being offered by Statistics Canada.

PRIORITIES FOR NEXT YEAR

Methods

The current standard method for seasonal adjustment across National Statistics is X11-ARIMA, as incorporated in the 1988 release of Statistics Canada's X11-ARIMA software program. Adjustment using this method produces robust estimates of seasonal factors and is used by most of the leading producers of official statistics across the world. The X11-ARIMA program offers the flexibility to tailor the seasonal adjustment to individual series and incorporates estimation routines for calendar adjustment.

In the last couple of years new and more reliable versions of X12-ARIMA and the model-based TRAMO-SEATS programs have been released and both Eurostat and the European Central Bank have expressed a clear preference for EU member states to use one of these packages in the interests of harmonisation of the European Statistical System. TSAB already uses X12-ARIMA for most analysis and calendar adjustment estimation and is therefore already enhancing the quality of seasonal adjustment in the ONS, utilising some of the improvements offered by the program. However, the production of seasonal adjustment in ONS systems is currently done using X11-ARIMA and the mis-match between analysis and production is inefficient and limits the extent to which the X12-ARIMA options can be fully implemented.

A key priority for the coming year is to decide whether and when to introduce X12-ARIMA as a new standard package for seasonal adjustment and, depending on the outcome, start work on implementation. The case for X12-ARIMA is strong; it will bring us into line with European practice and enable us to utilise fully the additional estimation, analytical and diagnostic tools that the program offers.

Datasets

The following is the list of series that it is proposed be given high priority next year. They fall into two categories: (1) datasets for which there are particular quality concerns or issues to be addressed; (2) key ONS outputs for which seasonal adjustment will always be important and which will be a high priority every year. Several criteria have been employed in drawing up these lists, including: the stability of seasonality in datasets; known estimation, system or classification changes which will require re-assessmnet of seasonal factors; knowledge of outstanding problems or issues; and a prioritisation by importance of individual datasets and the role of seasonal adjustment in the way the ONS presents them. Note that where a dataset is included in the first list it has not been repeated in the second. Both lists are given in priority order.

Datasets requiring particular attention in 2001/02:

i. Retail Sales Index – work on the core adjustment and implementation of new work on the calendar and phase shift adjustments which arise due to the 4-4-5 week data collection pattern.

ii. Index of Services – the monthly index is currently being developed and the seasonal adjustment needs to be reviewed as new data sources and estimation methods are developed for it.

iii. Capital Expenditure – this dataset is currently being adjusted at an extremely low level of disaggregation. This will be changed when the new compilation system for this dataset comes on-line and adjustments for more aggregated series will need to be set up.

iv. Work Force Jobs – the seasonal adjustment needs to be re-worked following large revisions to the data.

v. Dividends and Interest Matrix – a coherent system of adjustments which meet the additivity constraints of the matrix needs to be introduced for the first time since the introduction of the ESA(95) dataset.

Key datasets not included above which will always be given a high priority:

i. Labour Force Survey
ii. Household Expenditure
iii. Trade in Goods
iv. Average Earnings Index
v. Index of Production

Re-analysis Process

The 3 main changes of focus for the re-analyses process itself are:

i. user orientation – the first year of re-analyses was necessarily very production orientated, working out which series are currently being seasonally adjusted, in which datasets and which systems. In the second year we intend re-grouping re-analyses into datasets which are meaningful to users of the data. We will also aim to focus more of the analysis on key economic indicators rather than the components that make up these indicators. We will do further work to understand the uses of the data and to look at the way in which the data are presented in First Releases, publications and on the web-site. This will enable us to identify inconsistencies and encourage a more standardised presentation of time series data.

ii. efficient processes – the second round of re-analyses should be much more efficient than the first since datasets and seasonal adjustment are already documented. We can also draw on the experience we gained last year to timetable the analyses more effectively. Some parts of the process can be streamlined with, for example, end of analysis presentations being grouped together into broader subject areas such as labour market statistics or balance of payments.

iii. staff – the branch had 4 members of staff at the beginning of the last business year and built up to 9. The challenge of completing analyses while training new staff put considerable pressure on us all last year, but should be considerably alleviated this year, enabling more time to be devoted to the key data issues.

CONCLUSION

The first year of re-analyses has seen a step change in the quality of seasonal adjustment and the work done and experience gained provides a firm foundation for taking a strategic view of future work in this area. There are problems with some datasets, but where they exist, they are clearly documented and can be prioritised in a corporate way. Risks to the Office of problems with seasonal adjustment are now considerably reduced and the possibility of introducing X12-ARIMA as the standard software for seasonal adjustment, together with the documentation now being produced, open the way for providing users with much more information about the seasonal adjustment being carried out in the Office.

Simon Compton
April 2001