*** **draft in progress:** please ignore Lisa's bits in **teal**, purely reminders for Lisa :) ***
*** also please ignore Frank's bits in **hot pink**; these are some outstanding issues ***
*** BEST TO PRINT OUT DOCUMENT IN LANDSCAPE ***

CONSISTENT SEASONAL ADJUSTMENT

What?
Consistent seasonal adjustment came to prominence within the ABS via the Sept04 ESSCC meeting (see Related topics > Other below for link to relevant document). In essence, it stated that we would generally expect that broadly similar original estimates from different ABS subject matter areas (SMA's; inputs) would result, after seasonal adjustment, in broadly similar seasonally adjusted estimates (outputs). In reality, discrepancies between related collections' original estimates, or, discrepancies between the seasonally adjusted methods employed can result in discrepancies between seasonally adjusted movements of broadly similar time series. It is the similarity between seasonally adjusted movements, i.e. the 'underlying economic stories' between conceptually related time series that we refer to as "consistency".

This should not be confused with the term "coherence", which refers to a more broad relationship between two series and not necessarily to a similarity in seasonally adjusted movements. For example, as the price of petrol goes up, car sales (or other luxuries) might go down. Is this relationship maintained after seasonal adjustment? This can therefore be interpreted as a 'weak' form of consistency. Due its generality and the myriad of forms in which it comes in, we don't explicitly focus on preserving coherence in the seasonal adjustment process. It is usually preserved anyway.

The ESSCC meeting highlighted two recommendations: (i) that in the short term, discrepancies in the methods of seasonal adjustment between related collections should be addressed manually on a case-by-case basis and (ii) in the long term that SEASABS functionality be enhanced to provide links between series and built-in checks for auditing these aspects of seasonal adjustment.

Consistency generally relates to similar prior corrections, X11 parameter settings and other seasonal adjustment options between conceptually related time series. 'Conceptually related' generally refers to time series that fall under either of the following broad categories:

(i) derived from another (eg State and Territory or industry splits of a National aggregate), which, regardless of whether the movements are similar, the series are always related on conceptual grounds;

(ii) derived from the same source collection: eg we perform seasonal adjustment for National Accounts and many of its source collections independently. National Accounts further tweak their originals for reconcilation with annual benchmarks;
(iii) declared to be conceptually related across collections from different subject matter areas, or, across different industries within the same area; or
(iv) derived from the same source but compiled on either a monthly or quarterly basis (eg. we perform independent seasonal adjustment for Balance of Payments original monthly estimates and equivalent quarterly series compiled from the monthlies).

For any of these cases, it is important to ensure that the series have consistent, but appropriate prior corrections and seasonal adjustment parameters.

Why do we assess it?

It is important to maintain consistency in ABS products (e.g. published seasonally adjusted estimates) derived from different, but conceptually related sources. We want to ensure that the seasonal adjustment process does not introduce inconsistencies due to inconsistent treatment, in terms of seasonal adjustment parameter settings and/or priors.

Our goal is to ensure consistent and appropriate seasonal adjustement (SA) between a pair of conceptually related series. 'Conceptually related series' here refers to seasonally adjusted components with similar (correlated) movements, not levels. The underlying degree of relatedness between two series can be seen once the seasonal pattern is removed from the originals. This is because the originals could have different intrinsic seasonal patterns, hence leading to different movements in original terms. Even if one does not have immediate access to seasonally adjusted components to ascertain their similarity, it will be assumed that a pair of series declared to be related by a subject matter area will be in terms of their underlying SA movements (i.e. as reflected by their 'real' economic/business-cycle behaviours).

Consistent and appropriate SA can be achieved by comparing all residual priors and systematic differences in the seasonally adjusted components. Once the differences are highlighted, we can proceed to explore whether they are appropriate or inappropriate for each series of a related pair. We hope to achieve this at a level where any residual differences (unless they are appropriate or expected) are purely stochastic in nature, i.e., dictated by varying degrees of volatility.

When do we assess it?

At each ASR by a member in the TSA section delegated by the CSM. The process will be initiated with a list of known related series pairs already in the system and confirmed with the client in the initial contact proforma. If none exist, then we will need to ask the client. A suggested wording for the initial contact proforma is:

"Please advise us of any other subject matter areas that we should ensure consistency with. In other words, we would like to know if the seasonal adjustment should be consistent with that performed for other areas. This is to avoid potential conflicts in estimates derived from conceptually related data sources. We have just started this practice so please let me know if unsure."

Repeated and/or iterated as necessary during the ASR to ensure the most appropriate consistency before closure of the ASR.

When a client requests an ad-hoc consistency check or a summary of current consistency diagnostics for a list of conceptually related series.

When TSA makes a change to one series in an ASR that has more data than the consistent series (happens as different collections will compile estimates at different times). In this case, TSA should:

- Inform relevant owner of consistent data series.
- Determine and 'book-in' an appropriate time to review and if necessary implement changes to consistent series, when estimates are available.

How do we assess it?

The following are "interim" guidelines for use in production work until they become refined enough for implementation in SEASABS. The SEASABS version will include more features to streamline the consistency assessment/checking process (e.g. an interface to create and store lists of conceptually related series and the use of a number of series components for diagnostic checks).

Currently (15/11/06) we generate consistency summary tables and diagnostics using the "ABS" seasonally adjusted series components as inputs since, at the time of writing, only "ABS" seasonally adjusted components are available for downloading via "TSA-download". Other important components such as "prior-corrected (D11)" seasonally adjusted series will be available for use for consistency purposes in the SEASABS version. The diagnostic tests below are optimised for seasonally adjusted series components. However, if used with other components (e.g. originals), the results must be interpreted with caution. The presence of seasonality in original series components is likely to dominate the movement measures and statistics.

Creating a consistency table

1. Before creating a consistency table, you will need to create two types of files: (i) a "mapfile" and (ii) one or more "TSA-downloaded" group summary files.

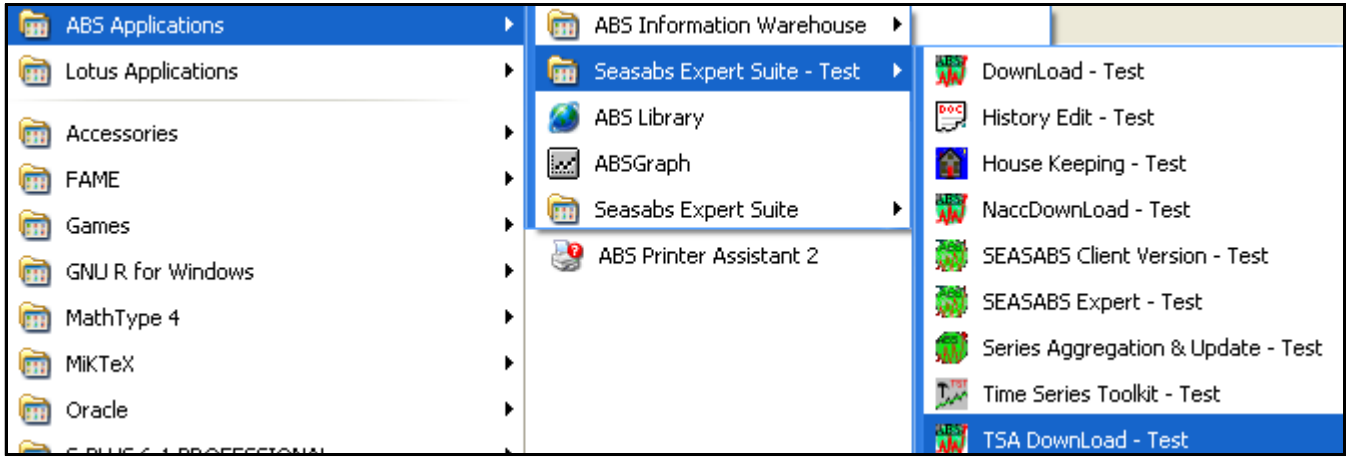
2. The "mapfile" is a text file listing pairs of series that you expect to be conceptually related. For example, see: "S:\consistency\Examples\NAB\nabmap.txt". In a text editor (notepad or ultra-edit), set up a text file listing pairs of related series names in the following format:

   ```
   ownergroup1, group1, series1, ownergroup2, group2, series2
   ```

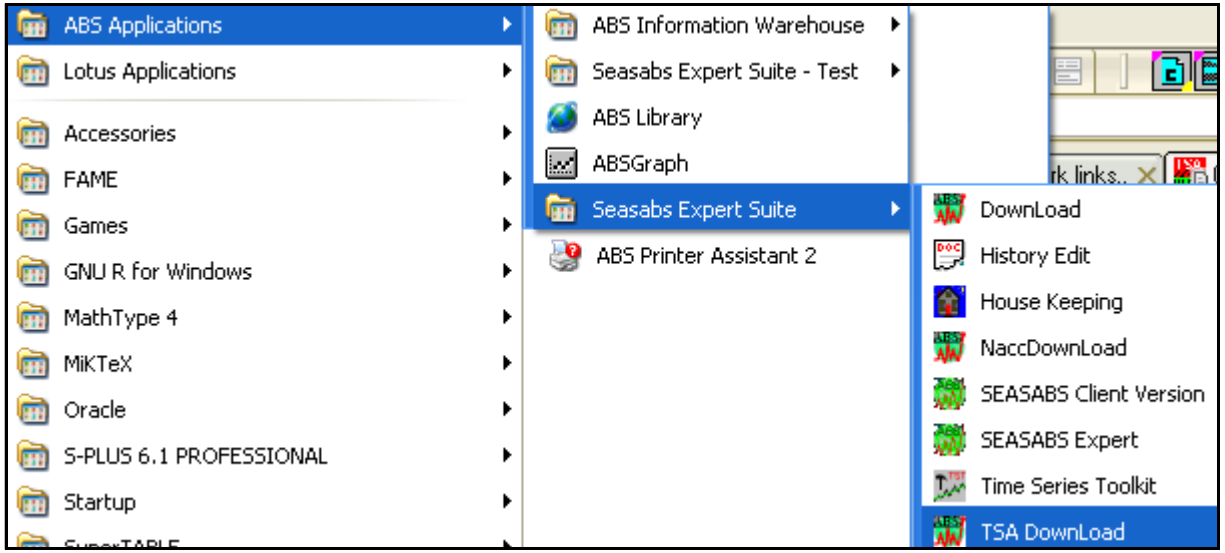
   Commas must be included to delimit the six fields. If you wish to compare a single series (e.g. a state or industry aggregate) against multiple state or industry components, please list this single series repeatedly on the left hand side of the mapfile, e.g. see: "S:\consistency\Examples\State Tourism\stamap.txt".

3. Create file(s) by extracting the series knowledge of the group(s) of interest. To do this, start up the "TSA-Download" tool. You want to use version 2.6 or above which at the time of writing (15/11/06) is accessible under "Seasabs Expert Suite - Test". This version will be released into production in mid December 2006.

Before the mid-December 2006 Seasabs release:



After the mid-December 2006 Seasabs release:



i. Select "File -> Open Group/Series".

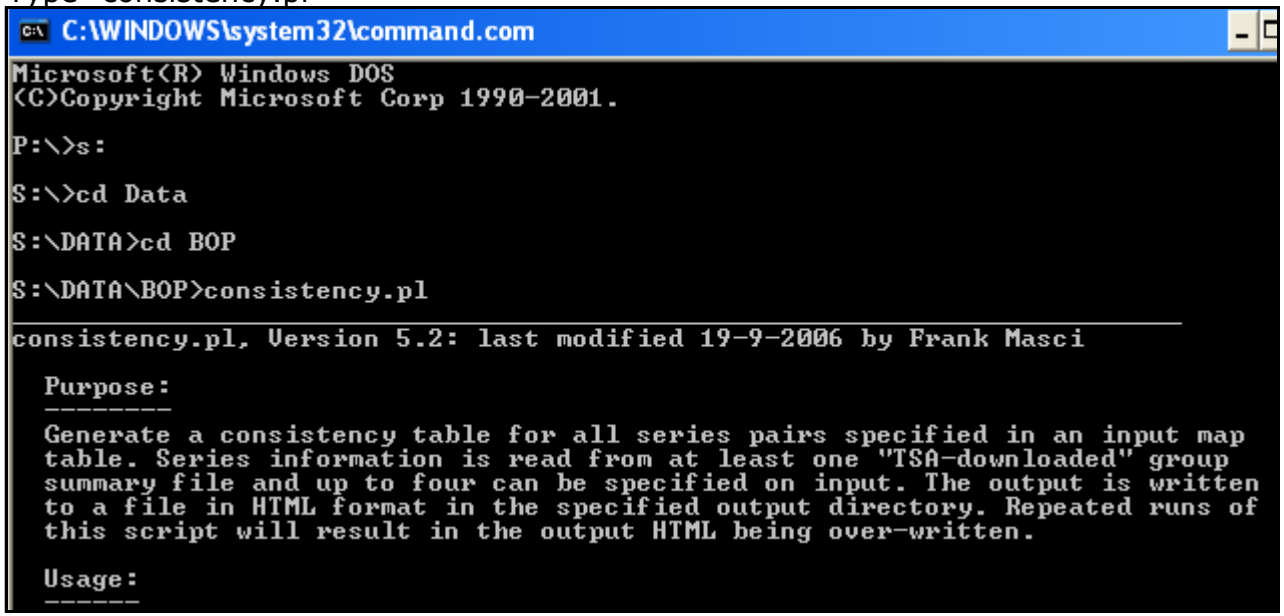
ii. Select the appropriate group from the list that correspond to your series in the map file. Note that there can be more than one group represented in your mapfile, so the following exercise will need to be repeated for each group separately.
iii. To save the group series knowledge, select "Save Output to DOS" and then select the "Seasonally Adjusted Series (orig/comb)..." option.

4. Ensure you have "Perl" installed from the the ABS software portal. It is free software so supervisor approval is not needed. Note that no shortcuts are created when "Perl" is installed so it is NOT accessed via Start->All programs. "Perl" is a scripting language and run from the DOS command prompt.

5. To execute the latest version of the consistency tool from anywhere in your directory structure, you will need to perform the instructions contained in:  (Subject: To execute "consistency.pl" from anywhere in your directory structure!; Database: Time Series Analysis WDB; Author: Frank Masci; Created: 14/11/2006; Doc Ref: NACT-6VJ3G9).

6. Bring up the DOS command prompt window: Start->All programs->Accessories->Command prompt. You can mount to a drive directory by typing the name of the drive following by a colon, e.g. for the S-drive, type "s:". You can change to a directory of your choice by using the "cd" DOS command. See example below.

7. Type "consistency.pl"



You should get a purpose statement, usage summary, and examples written to the screen. If you don't get this far, then "Perl" has not installed successfully and you will need to contact the Help desk. The input files listed in these examples are under "S:\data\BOP\Frank'sConsistency". Thus, you can experiment for yourself to get a feel on how the program works before attempting the real thing. If you wish to experiment first with this example, you will need to copy the contents of this directory to a personal directory and execute the tool in this personal directory.

Understanding and using the consistency table

1. An example of a consistency table is given in the following HTML link:

   results_sa.html

   Overall, it gives is a summary of all relevant SEASABS parameters and settings for each series of a conceptually related pair from the mapfile. The first series of a pair is in a yellow row and the corresponding second series is in a subsequent blue row. Note that if the first (left-most) series in your input mapfile was repeated (e.g. if comparing the

same aggregate against state component series), then this first series is only shown once in the output table. For example:

results_aggstruct.html

The table is designed to assist you in the consistency checking process (expanded in TEST 1 below). Having these parameters for a collection of series pairs stacked in row format allows for a quick comparison.

2. Within each blue row (containing the second series of a related pair) is a link containing the results of diagnostic tests performed on that series pair. The table below summarises the various tests, goals and their main diagnostics. It also contains a summary of what constitutes a "Pass" or "Fail" for each test and a reference to the relevant section in this BPG on "how to fix" a failure. "Pass" here implies that the outcome of the test satisfies a specific criterion that makes a series pair "consistent" with respect to some measure. "Failure" here implies that the outcome of the test renders a series pair "inconsistent" with respect to some measure or criterion. For a detailed description of each of the diagnositic tests, see: (Subject: Quantifying and Improving Consistency: version 3; Database: Time Series Analysis WDB; Author: Frank Masci; Created: 16/02/2006; Doc Ref: FMAI-6M33Y3).

3. Having generated a consistency table, you are now ready to assess whether any of the series pairs are inconsistent. The procedure is to simply work your way through TESTS 1-6 and look out for failures. The "FAILS IF.." column in the table below tells you what constitutes a failure. If a test fails, look under the "IF FAILS, THEN.." column on how to fix or improve specific inconsistencies implied by the failure.

TEST NUMBER - eg TEST1 used as reference in this topic	**GOAL(S)** - the goal(s) of test and what it hopes to achieve	**MAIN DIAGNOSTIC OUTPUTS** -the main output summary/conclusion to look for in the diagnostics section of the consistency table.	**PASSES IF** - what makes the test pass?	**FAILS IF** - what makes the test fail?	**IF FAILS, THEN** - a reference to the relevant section in this topic which suggests "what to do" in case of a failure. A quick solution to the fix is also given.
1	Report when there is an inconsistency between the series pair in any one or more of the following "main" processing parameters:	Under TEST1 banner in output look for warnings after the three asterisks. These summarise the results from the comparison of the main	If periodicities the same ie monthly vs. monthly or quarterly vs. quarterly, and all the "main" processing parameters are consistent.	If periodicities the same ie monthly vs. monthly or quarterly vs. quarterly, and if one of more of the "main" processing parameters are	*see section* ??? Quick fix: Go back and fix the inconsistent parameter settings in SEASABS if you

	"Method", "Model", "TMA", "PUB_TMA", "PUB_EWP", "SMA", "Trading day", "Easter" and "Father's Day". Note: the "Method" field (=either "direct", "indirect" or "not adjusted") is only compared if either series is "not adjusted". We don't necessarily want to declare an expected "direct" vs. "indirect" (ie. aggregative) series pair as inconsistent. This excludes prior corrections since these are handled in TEST4 and TEST5 below.	processing parameters. If the periodicities are different (e.g. monthly vs. quarterly), then differences in these "main" parameters are allowed. *But please check that they do make sense for each series.*	Eg message: *** All main processing parameters for this series pair are consistent (i.e. "Model", "TMA", "PUB_TMA", "PUB_EWP", "SMA", "Trading day" "Easter" and "Father's Day"). If the periodicities of each series in the pair are different, then you'll see: *** Periodicities are not the same: inconsistencies are expected in processing parameters and settings. Please check all are appropriate.	inconsistent. You'll get a message reporting which parameter(s) is(are) inconsistent, e.g: *** The "X11 TMA, PUB_TMA" parameter settings are not consistent for this series pair. Please review.	think they should all be the same - i.e. if there are no justifiable reasons why they should be different. An example of a justifiable reason on retaining different seasonal adjustment parameters is the SMA filter length if the series have grossly different spans or levels of volatility.
2	To check that the series pair are indeed related by testing that their movements are correlated. The basis of this test is to ensure that the cross-correlation coefficient between movements is significantly different from zero at some lag h: $H_0 : \rho(M_1, M_2)_h = 0$ vs. $H_1 : \rho(M_1, M_2)_h \neq 0$	Under TEST2 banner (which is also a link to plots) in output look for warnings after the three asterisks. These summarise whether statistically the series pair are correlated. The two CCF plots (by clicking on the "* TEST 2..." title link) represent the cross-correlation function vs. lag for 1) with outliers in the movement_series1 vs. movement_series2 distribution included, and 2) with suspect outliers removed.	The zero-lag cross-correlation coefficient is significantly different from zero. Eg message *** CROSS-CORRELATION COEFFICIENT (WITHOUT OUTLIERS) SIGNIFICANTLY DIFFERENT FROM ZERO AT <5% LEVEL => SERIES ARE INDEED RELATED	The zero-lag cross-correlation coefficient is consistent with zero. Eg message *** CROSS-CORRELATION COEFFICIENT (WITHOUT OUTLIERS) CONSISTENT WITH ZERO AT >5% LEVEL => SERIES MAY NOT BE RELATED	*see section ??* Quick fix: Implication is that series movements and hence the series in original terms are outright unrelated and inconsistent. Not much you can do except notify the client if they really expected consistency. If so, then do your best to address any failures in TESTS 1, 4 and 5.

3	To determine whether the underlying movement magnitudes and directions of movements are overall mutually consistent between the two series. That is, for example, are the movement magnitudes of series 1 larger (or smaller) in a broad sense than those of series 2? Note: the movements can be significantly correlated even if their mean overall magnitudes differ. If the movements are significantly different (inconsistent) overall, then it raises a warning (query) for the client and an interpretation is needed if it can be related to a real-world effect.	Under TEST3 banner (which is also a link to plots) in output look for warnings after the three asterisks. These summarise the mean difference in movements, the fitted slope and the fitted intercept results. Clicking on the "* TEST 3... " title link brings up a plot of the time-matched movements in series 1 versus those in series 2. The black solid line defines the "line of equal movements", the blue dashed line is the robust linear regression fit, the green lines encompass a ~99.73% (~3σ) confidence interval for the residuals about this fit and the crosses indicate outliers falling outside this interval. The more the blue dashed line coincides with the black line, the more "consistent"are the movement magnitudes overall.	The mean difference in movements is consistent with zero. Eg messages *** MEAN DIFFERENCE IN MOVEMENTS CONSISTENT WITH ZERO AT 36.97 % LEVEL *** FITTED SLOPE CONSISTENT WITH ONE AT 16.45 % LEVEL *** FITTED INTERCEPT CONSISTENT WITH ZERO AT 65.23 % LEVEL	The mean difference in movements is significantly different from zero. Eg messages *** MEAN DIFFERENCE IN MOVEMENTS SIGNIFICANTLY DIFFERENT FROM ZERO AT 5% LEVEL which could be due to either of the following: *** FITTED SLOPE SIGNIFICANTLY DIFFERENT FROM ONE AT 5% LEVEL OR *** FITTED INTERCEPT SIGNIFICANTLY DIFFERENT FROM ZERO AT 5% LEVEL	*see section ??* Quick fix: Is this due to a non-unit slope (=> movements related by scale factor), non-zero intercept (=>movements related additively by an offset) or both? There's not much you can do to fix this. You might just want to report it to the client for their information. This may have theoretical economic implications!
4	To reveal inconsistencies in movements at the same time points between two series. This test is based on detecting outliers in the movement vs movement	Under TEST4 banner (which is also a link to the same plot as in TEST 3) in output a list of all outliers detected are reported. It is recommended that the user	No outliers were found from the movement vs. movement plot.	Outliers were found from the movement vs. movement plot.	*see section ??* Quick fix: This usually implies a large extreme, outlier, break or some deviant present in

	plot. For example, if "prior-corrected" (D11) seasonally adjusted series are being compared, then the presence of a large movement in one series but not the other may imply that there has been an inconsistent prior-correction applied, or, that the actual originals are conceptually different at those timepoints.	trace their cause. For example: *** NUMBER OF > 3 SIGMA OUTLIERS DETECTED IN MOVEMENT VS MOVEMENT PLOT = 6 : *ALL OUTLIERS: * MTH or QTR/YEAR | MVT1(%) | MVT2(%) | approx.#SIGMA | P-VALUE: * 3/1977 | -9.61 | 7.78 | 10.12 | 4.307e-024 * 4/1977 | 15.35 | 3.97 | -6.32 | 2.539e-010 * 3/1978 | 4.09 | 13.46 | 5.65 | 1.609e-008 * 3/1979 | 18.47 | 30.30 | 7.35 | 2.039e-013 * 1/1981 | 11.02 | 4.08 | -3.79 | 1.486e-004 * 3/1981 | -11.28 | -5.64 | 3.20 | 1.357e-003 **Note**: you will need to look at the "periodicity" row in the consistency table to determine whether the first column in this outlier table means "Mnth/Year" or "Qtr/Year". If either series has periodicity="quaterly", then we have "Qtr/Year", otherwise it's "Mnth/Year". The SEASABS version will explicitly have Jan or Qtr 1			one series but not the other. If they are significant (i.e. relatively large), then make sure they are represented in your nominal list of priors in the consistency summary table. It is recommended that you compare either the seasonally adjusted or original series components at the outlying timepoints to determine which series in the pair needs the correction. If a prior is not represented in your nominal list, then set them explicitly in SEASABS, seasonally re-adjust and re-run the consistency check.
5	To determine if there is a pattern in "excess" movement difference	Under TEST5 banner (which is also a link to plots) in output a summary of this	No significantly non-zero ACF & PACF values were reported implying no	Significant non-zero ACF & PACF values were reported implying evidence of a	*see section ??* Quick fix:

	values (M1 - M2) as a function of time. By excess, we mean absolute values of the movement differences that exceed some threshold (ie. outlying beyond a currently hardcoded 2-sigma limit). For example, if we are examining original (unmodified) series, then a significant pattern in thresholded movement difference values may imply different seasonal patterns and/or strengths. Also, if a significant pattern is found between seasonally adjusted components on timescales of 12 months, then this may imply that residual seasonality is present in one series but not the other. Note that this test is not sensitive to detecting residual seasonal movements of the same magnitude in both series.	test is provided. This outlines: • the "threshold" that has been set; • the number of movement differences that are beyond this threshold; • any significant lags in the ACF and PACF plots It's important to never believe these conclusions outright. As the last line implies: "CHECK ACF PLOTS". You want to ensure that there is indeed a systematic pattern in the indicator sequence { i(t) } plot. Clicking on the "* TEST 5... " title link brings up the following plots: • the indicator sequence *i(t)* which = 1 if the movement difference at timepoint *t* exceeds a hardcoded 2-sigma threshold, and = 0 otherwise; • the autocorrelation function (ACF) vs lag of the *i(t)* sequence; • the partial-autocorrelation function (PACF) vs lag of the *i(t)* sequence.	evidence for a temporal pattern in movement differences. Eg message * MOVEMENT DIFFERENCE THRESHOLD = 2 SIGMA * NUMBER OF |M1 - M2| VALUES ABOVE THRESHOLD = 6 * LAGS WHERE ACF & PACF[i(t)] ARE GREATER THAN 95% CL VALUE: * NONE. * => NO EVIDENCE FOR TEMPORAL PATTERN IN MOVEMENT DIFFERENCES; ALL OKAY	temporal pattern in movement differences at the reported time-lags. Eg message * MOVEMENT DIFFERENCE THRESHOLD = 2 SIGMA * NUMBER OF |M1 - M2| VALUES ABOVE THRESHOLD = 5 * LAGS WHERE ACF & PACF[i(t)] ARE GREATER THAN 95% CL VALUE: LAG 4 ; * => REJECT "H0: ACF & PACF[i(t)]=0" OF NO PATTERN IN MOVEMENT DIFFERENCES * => SYSTEMATIC INCONSISTENCY EXISTS AT ABOVE (LAG) PERIODICITIES (CHECK ACF PLOTS)	If a significant temporal pattern is found at a seasonal annual lag (4 for quarterly; 12 for monthly) and if you are looking at "seasonally adjusted" components, then it implies that residual seasonality is present in one series relative to the other. It is advised that you peruse the seasonal factors and/or S*I charts and ensure that seasonality is eradicated as much as possible in the seasonally adjusted components. A pattern at a non-seasonal (non-annual) lag would be intriguing and suggests the presence of autocorrelated behaviour on some underlying business cycle.
6	To test whether both series	Under TEST6 banner (which	**(i)** both series are	**(i)** both series are not	*see section ??*

	are: **(i)** integrated with the same order d (d >= 0) using a 'unit root' tests. This enables one to regress one series <u>level</u> on the other and derive <u>unbiased</u> correlation measures between series <u>levels.</u> **(ii)** cointegrated at some level of significance. This implies the series have common long-term trends, i.e. they track each other consistently in the 'long-run'. Cointegration implies a stronger test for 'conceptual relatedness' between two series.	is also a link to four plots), look for main warnings after the three asterisks. These summarise: **(i)** whether the series are integrated with the same order. If so, regression estimates and correlation measures are given between series levels. **(ii)** whether the series are cointegrated. Diagnostics of the level of cointegration involved are given.	integrated with the <u>same order</u> (zero included), i.e. both are I(d) where d >= 0 . Eg messages: *** Series have same integration order: [1 1] OR *** Series have same integration order: [0 0] **<u>AND</u>** **(ii)** series pair is cointegrating. Eg message: *** According to either AEG or Johansen tests, series pair is cointegrating	integrated with same order. Eg message: *** WARNING: series pair not integrated with same order: [0 1] **<u>OR</u>** **(ii)** series pair is <u>not</u> cointegrating. Eg messages: *** According to both AEG and Johansen tests, series pair is not cointegrating OR *** Series pair not cointegrating since components not integrated with same non-zero order	<u>Quick fix:</u> A failure in either (i) or (ii) implies that the prior assumption of a 'conceptually related' series pair is not a good one. The series don't track each other in the 'long-run' (i.e. trends not common over long spans). Please first peruse the diagnostics and plots for marginal cases (e.g. outliers/breaks skewing the results). You might want to bring this to the client's attention and ask whether they really expected 'long-term consistency'. This may have unexpected theoretical economic implications!

Once we have assessed it what then?

Standards/guiding principles to consider. The following questions will arise depending on the outcomes of **TESTS 1, 4 and 5:**

- When is it appropriate to change/not change a TMA, SMA, Model, EWP, presence of Easter, TD etc? These decisions to be summarised in the table below.
- When is it appropriate to change/not change (or insert new) "timepoint-specific" prior factors, e.g: LGEXs, AOs, TBs and/or SBs? These decisions also to be summarised in the table below.
- When do we change/not change/optimize settings controlling the removal of regular (periodic) seasonality from series. e.g. SMA filter properties? These decisions to be summarised in the table below.
- How do we treat the presence of systematic residual (differences) in seasonality between two series: e.g. differences in seasonal strengths, and/or, cycle length?
- **Should we prioritise inconsistencies if several are found? E.g. which is most important: model, TMA, SMA,**

prior factors etc.. Is there an order in which we should tackle these?

- How do we include the subject matter area in discussions about consistency? A suggestion is to treat these as queries and include them in a relevant BPG: Re: how to query?
- Note that we can provide subject matter areas with a copy of the consistency table. The consistency tool has options to omit computation of diagnostic measures and also the inclusion of priors (TBs, SBs, LGEXs and AOs). This will create a much more simplified version for the client. If it is imperative that we also provide diagnostics with all the plots, then it is suggested that the directory containing all the HTML and png plot files be gzipped and forwarded to the client.
- We need some guidelines on how to monitor consistency maps and keep them up to date. There should also be something in the initial contact proforma asking if there have been any consistency changes since the last year.

Source of inconsistency	Between any pair of conceptually related series	Between component and aggregate
Model		
Indirect vs direct		
EWP (or tailored end weights)		
TMA		
SMA		
Trading day (TD)		
Easter Proximity (EP)		
Father's Day Proximity (FD)		
Trend breaks (TBs)		
Seasonal breaks (SBs)		
Large Extremes (LGEXs)		
Additive outliers (AOs)		
User-defined regressors		
Other?		

Related BPG TOPICs

SEASABS Help:

SEASABS help on "consistency" not yet implemented. Envisage the bulk of this will come from information contained within:

TSAWDB>Research>Quality> (Subject: Quantifying and Improving Consistency: version 3; Database: Time Series Analysis WDB; Author: Frank Masci; Created: 16/02/2006; Doc Ref: FMAI-6M33Y3) **Lisa to liaise with Joesph when things are more final**

Other:
For more background on Consistency see:

TSAWDB>Client Suport>National Accounts and State Accounts>Other>response to "Identifying coherence problems - ESSCC draft" (Subject: identifying coherence problems - ESSCC agenda item 5; Database: Time Series Analysis WDB; Author: Tom Outteridge; Created: 23/09/**2004**; Doc Ref: TOUE-653UK6)

TSAWDB>Documentation>Educational material> (Subject: Time Series Dictionary; Database: Time Series Analysis WDB; Author: Andrew Sutcliffe; Created: 10/12/2003)

TSAWDB>Research>Quality> (Subject: Consistency MD seminar (2006) slides..; Database: Time Series Analysis WDB; Author: Frank Masci; Created: 10/11/2006; Doc Ref: FMAI-6VE8B3)