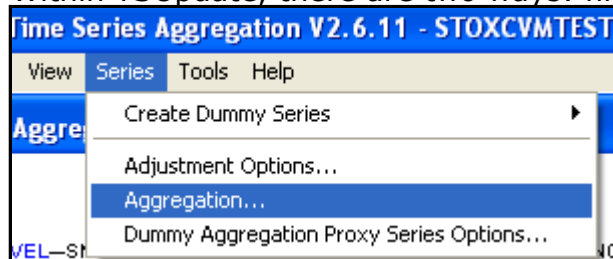


# Aggregation Build Operators within TSUpdate (vsn 2.6+)

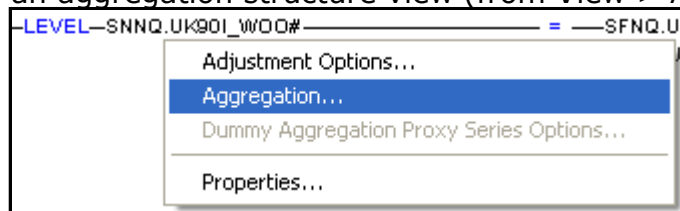
Frank Masci, 12/10/2006

## How to bring up the build aggregation tool and operator lists:

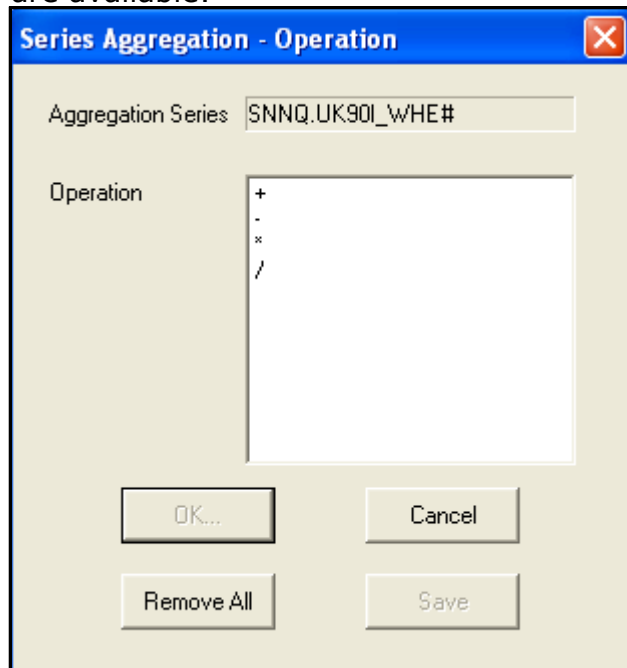
Within TSUpdate, there are two ways: first, from the menu:



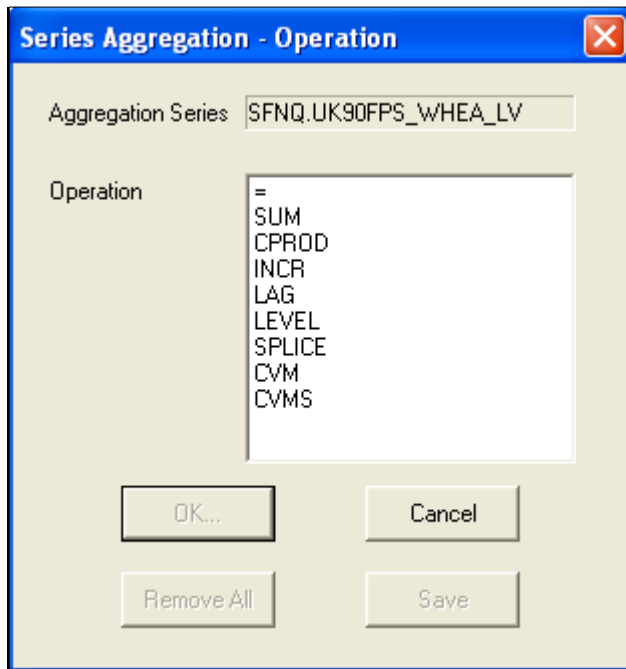
and second (which is the more common way), is by right clicking on a series in an aggregation structure view (from View > Aggregation Structure):



For series in an existing aggregation structure, only the following build operators are available:



For new series that are not linked in an aggregation structure, or, for children (component) series at the end of the food chain (or more politely, the leaves of a tree), the following operators are available:



### Available aggregation operators:

In the second "Series Aggregation - Operation" window above, we have the following operators which may not be immediately intuitive. This is from TSUpdate version 2.6 (release Dec 2006).

#### **= & SUM :**

standard equals and summation "+" operators. The only possible for a child series at the end of a branch.

#### **CPROD :**

cumulative product function. E.g. for a series  $\{x_1, x_2, x_3, x_4, \dots, x_N\}$ ,

$$\text{CPROD}(x_1, x_2, x_3, x_4, \dots, x_N) = \{x_1, x_1 * x_2, x_1 * x_2 * x_3, x_1 * x_2 * x_3 * x_4, \dots, \prod_{t=1}^{t=N} x_t\}.$$

#### **INCR :**

The first difference for a series. E.g. for a series  $\{x_1, x_2, x_3, x_4, \dots, x_N\}$ ,

$$\text{INCR}(x_1, x_2, x_3, x_4, \dots, x_N) = \{x_2 - x_1, x_3 - x_2, x_4 - x_3, \dots, x_N - x_{N-1}\}.$$

#### **LAG :**

A series that is shifted backwards in time by "k" periods where k is a user specified lag. E.g:  $\text{LAG}_k(x_1, x_2, x_3, x_4, \dots, x_N) = \{x_{1+k}, x_{2+k}, x_{3+k}, x_{4+k}, \dots, x_N\}$ . I.e. the first "k" observations are chopped off and the remaining observations are assigned timepoints from the start of the original (k=0) series.


#### **LEVEL :**


cumulative sum function. E.g. for a series  $\{x_1, x_2, x_3, x_4, \dots, x_N\}$ ,

$$\text{LEVEL}(x_1, x_2, x_3, x_4, \dots, x_N) = \{x_1, x_1 + x_2, x_1 + x_2 + x_3, x_1 + x_2 + x_3 + x_4, \dots, \sum_{t=1}^{t=N} x_t\}.$$

#### **SPLICE :**




 (Subject: Testing 2D Reconciliation with retail; Database: Mark Zhang; Author: Duncan McCaskill; Created: 25/09/2006) and background of the method

 (Subject: matrix algebra for specifications; Database: Time Series Analysis WDB; Author: Alex Stuckey; Created: 20/02/2006; Doc Ref: ASTY-6M75NH)

- You can play with the group BCKCST\_RETAIL\_SEASABS\_CONC under the BACKCASTING owner group in the USEDR DB. Mark Zhang built a complete Retail 2-D reconciliation structure there in early October 2006.
- A 1-D example can be found in the SEASABS\_CAPEX1 group under the ACC\_TEST\_SEAS owner group in the USEDR DB for (1) A\_TOTAL EQUIPMENT - AUSTRALIA and (2) UCA98EQP99\_AZ.

### **Further documentation:**

Following is a little outdated, initially from:


 (Subject: Periodic Update; Database: TA-Statistical IT Facilities WDB; Author: Otto Benda; Created: 25/08/1999; Doc Ref: T11ITAA)

#### **1.1 OVERVIEW**

#### **1.2 AGGREGATION STRUCTURE**

#### **1.3. PERIODIC UPDATE**

The following document outlines some problems and limitations when building aggregations under TSUpdate:

 (Subject: SEASABS/TSUpdate aggregation structures; Database: Time Series Analysis WDB; Author: Frank Masci; Created: 12/10/2006; Doc Ref: FMAI-6UH4LE)