DIVIND

DIVIND (PNORM=*obs id*,PRINT,PVAL=*value*,QNORM=*obs id*,
QVAL=*value*,TYPE=Q or P or N,WEIGHT=COMB or ARITH or GEOM)
name of output price index name of output quantity index
list of pairs of input price and quantity series ;

Function:

DIVIND computes Divisia price and quantity indices from a set of n price and quantity series. A Divisia index of prices is obtained by cumulating the rate of change to the values of an index of price change, observation by observation. The index of price change is the weighted sum of the rates of change of the component prices. The weights are the current shares of the component goods in the total current expenditure on all the goods in the index.

A Divisia index is the ultimate extension of a chain index. A Divisia index of quantity can be obtained by applying the same strategy to quantities in place of prices, or, alternatively, by dividing total expenditure by the price index. However, the two quantity indices will not be exactly the same.

Usage:

DIVIND has as its arguments the name to be given to the computed price index, then the name to be given to the computed quantity index, and finally the names of the series for prices and quantities of the components to be used as input to the calculations. The order is price for input one, quantity for input one, price for input two, quantity for input two, and so forth. No warning is given for non-positive prices for a quantity index, and vice versa (the formulas still hold unless WEIGHT=GEOM). When a quantity is zero for one or more periods, the good is temporarily excluded from the price index.

Options:

PNORM= identifies the observation where the price index is normalized. The index will have the value given by PVAL= at this observation. Note that there is no default for PNORM= .

PVAL= is the value to which the observation PNORM is to be normalized. The default is 1.0.

PRINT/**NOPRINT** tells whether the derived Divisia index series are to be printed. The default is no printing.

QNORM= identifies the observation where the quantity index is normalized. The index will have the value given by QVAL= at this observation. Note that there is no default for QNORM= .

QVAL= is the value to which the observation QNORM is to be normalized. The default is 1.0.

TYPE=Q specifies that the Divisia quantity index is to be computed and the price index is to be obtained by dividing total expenditure by the quantity index.

TYPE=P specifies that the Divisia price index is to be computed and the quantity index is to be obtained by dividing total expenditure by the price index.

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TYPE=N specifies that both a Divisia price index and a Divisia quantity index are to be computed. Note that the product of the two indices will not be exactly proportional to total expenditure.

WEIGHT=ARITH specifies that the weights to be used in computing this period's rate of change of the index are the arithmetic averages of the shares in this period and the previous period.

WEIGHT=GEOM specifies that the weights are the geometric averages of the shares in this period and the previous period.

WEIGHT=COMB specifies that the weights are the geometric averages of (i) the arithmetic average, (ii) the share this period, and (iii) the share in the previous period.

Either QNORM= or PNORM= is required if TYPE=P,Q and both are required if TYPE=N.

The default values of the options are the following:

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TYPE=Q,WEIGHT=COMB,NOPRINT,QVAL=1,PVAL=1
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Examples:

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DIVIND(WEIGHT=ARITH,TYPE=P,PNORM=67) PRICEIN,QUANTIN,PS,QS,PND,QND,PD,QD ;
FREQ Q ;
DIVIND (WEIGHT=GEOM,TYPE=N,PNORM=75:1,PVAL=100,QNORM=75:1,QVAL=100,PRINT)
        PI,QI, P1,Q1,P2,Q2,P3,Q3,P4,Q4 ;
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The first of these example computes a Divisia price index as a weighted average of changes in PS, PND, and PD, using the shares of PS*QS, PND*QND, and PD*QD in total expenditure as weights. The series PRICEIN is normalized to have the value 1.0 in 1967 and QUANTIN is derived by dividing PRICEIN into total expenditure.

The second example computes a price index PI and quantity index QI independently from quarterly data. Both indices are normalized to have the value 100 in the first quarter of 1975. The weights are geometric averages of the shares in the adjacent years.

Output:

Normally DIVIND produces no printed output, but stores the two computed index series in data storage. If the PRINT option is on, DIVIND prints a title, the options, the names of the input and output series, and a table of the two computed series labelled by the observation name.

References:

Jorgenson, Dale, and Zvi Griliches, "Divisia Index Numbers and Productivity Measurement," **Review of Income and Wealth**, Vol. 17(2), June 1971, pp. 227- 229.

Diewert, W. Erwin, "Exact and superlative index numbers," **Journal of Econometrics**, 4:May 1976, pp.115-145.