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To Trend in Microsoft Excel™, or Forecast in Microsoft Excel™, That is the Question

Walter W. O'Connell, M.E., ASA, SCSP



From time to time there arises a situation in all appraisers' lives where they find holes in a data set that they would like to use for appraisal assignments. That is to say, when working with tables with a period/time column (x-value) and data column (y-value) there is missing data. This missing data needs to be trended or forecasted to complete the data set for proper use. Or, we just need to forecast possible future outcomes when data is not yet available, for a prospective study.

Holes in data sets between two periods of published data usually take place for one of three possible reasons. First, because a data set was not yet been received or analyzed by the data collection source. Second, because the sampling size of the data was found to be too small to allow for a high enough degree of confidence to publish a data set conclusion for that period. Lastly, because the data set was found to contain errors or was collected/reported improperly. Regardless of whether the gaps are pricing holes, cost index holes, holes in Bureau of Labor Statistics data, or holes in location

indexes there always seems to be occasional gaps in a data sets, data with delayed release, or future data not yet collected by the publishers of a data source.

Speaking with fellow appraisers as well as looking back at my own work, we seem to bounce between using the Microsoft Excel™ Forecast Function (=FORECAST) and Trend Function (=TREND). Reviewing the Microsoft Office™ support webpage (<http://support.office.com>), functions are categorized into fourteen (14) functional categories. Within those categories are 'statistical functions' which are home to the forecasting and trending tool functions offered by Microsoft Excel™.

With over one hundred functions, the statistical function category offers a variety of basic and advanced statistical tools such as: 'testing for independence'; 'correlation coefficients'; 'F probability distribution'; 'returns on gamma distribution'; and 'the k-th percentage of values in a range'. From this, it was clear that my degrees and accreditations had **not** prepared me for the advanced statistical functions only a PhD in Advanced Statistics and Mathematics could understand.

To solve the issue concerning my lack of a PhD in Advanced Mathematics, I focused my search to linear trending and linear regression functions. My search was now narrowed to six functions! Of the six, I focused on functions that predicted (calculated) a future/past values using functions that used data values (y-values) with corresponding time values (x-values) (e.g. 2006, 2007, 2008 etc.) as source data. Only two functions met that criteria: the =FORECAST function and the =TREND function.

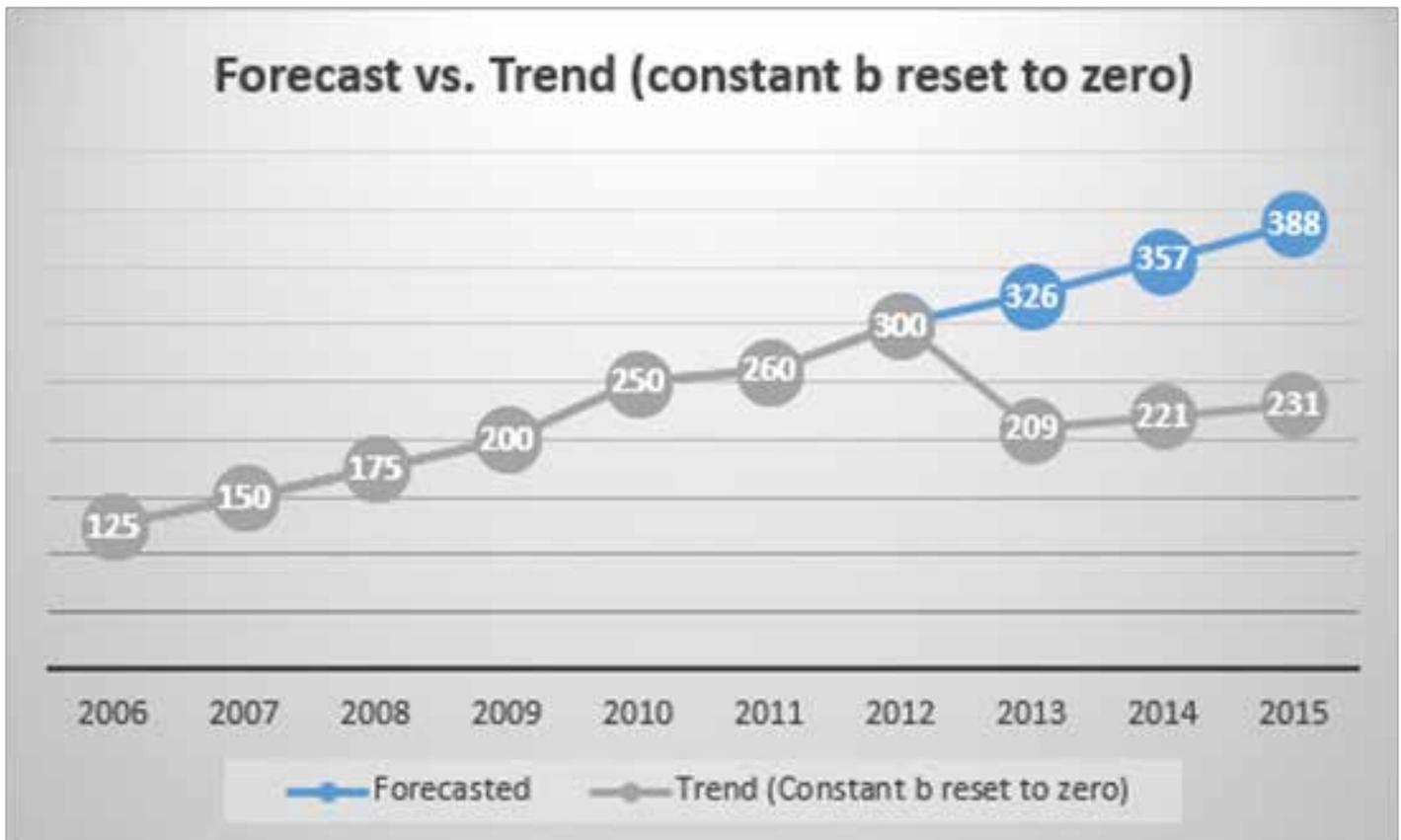
Now that we have the two functions that use traditional x- and y- values to derive forecasted/trended results it is time to perform a side-by-side comparison of both functions:

Forecasting/Trending Comparison					
	=Forecast	=Trend	=Trend	=Trend	
	constant not allowed	constant b = 'Blank'	constant b = "False"	constant b = "True"	Data
2006	125	125	125	125	Given
2007	150	150	150	150	
2008	175	175	175	175	
2009	200	200	200	200	
2010	250	250	250	250	
2011	260	260	260	260	
2012	300	300	300	300	
2013	=FORECAST(A12,B5:B11, A5:A11)	=TREND(C5:C11, A5:A11,A12)	=TREND(D5:D11,A5:A11,A12, FALSE)	=TREND(E5:E11,A5:A11,A12,TRUE)	Calculated
2014	=FORECAST(A13,B6:B12, A6:A12)	=TREND(C6:C12,A6:A12,A13)	=TREND(D6:D12,A6:A12,A13, FALSE)	=TREND(E6:E12,A6:A12,A13,TRUE)	
2015	=FORECAST(A14,B7:B13, A7:A13)	=TREND(C7:C13,A7:A13,A14)	=TREND(D7:D13,A7:A13,A14, FALSE)	=TREND(E7:E13,A7:A13,A14,TRUE)	
	Pass	Pass	Fail	Pass	

The =FORECAST function is straight forward, asking the user to define the given y-values (given data), x-values (periods 2006-2012), and x-value for the period to be forecasted (2013, 2014 or 2015). The forecasted results for 2013, 2014 and 2015, using the =FORECAST function are 326, 357 and 388, respectively (below).

Forecasting/Trending Comparison					
	=Forecast	=Trend	=Trend	=Trend	
	constant not allowed	constant b = 'Blank'	constant b = "False"	constant b = "True"	Data
2006	125	125	125	125	Given
2007	150	150	150	150	
2008	175	175	175	175	
2009	200	200	200	200	
2010	250	250	250	250	
2011	260	260	260	260	
2012	300	300	300	300	
2013	326	326	209	326	Calculated
2014	357	357	221	357	
2015	388	388	231	388	
	Pass	Pass	Fail	Pass	

The =TREND function asks the user for the same x- and y- value data as the =FORECAST function, but also asks for one additional piece of information at the end of the statement. That final piece of information requested is the definition of the 'Const' or 'Constant b'. This 'Constant b' is optional information that was tested by telling the function to force the 'Constant b' equal to zero ('FALSE') or telling the function to omit 'Constant b' ('TRUE') from the equation allowing the straight line to be calculated normally. In short, the 'Constant b' places restrictions on the equation of a straight line $y = mx + b$ and rests the y-intercept (the point where the slope of the line crosses the y-axis) to a point equal to zero (0).



We can see when using the =TREND function with 'Constant b' set equal to 'FALSE' the y-intercept (Constant b) is reset to zero, resulting in an understating of the calculated forecasted data (209, 221 and 231). If 'Constant b' is set equal to 'TRUE' (or omitted), the y-intercept is calculated normally. This results in the identical conclusions that are reached when using the =FORECAST function (326, 357, and 388).

After running different periods of time (x-value) and varying data (y-value) through the above Microsoft Excel™ template which returned identical results between the =FORECAST function and =TREND function, it is evident that the MS Excel™ Forecast function (=FORECAST) and the Trend function (=TREND) report the same forecasted/trended results as long as the 'Constant b' is not set to zero ('false'). Both functions, when **handled properly**, conclude the same results.

Happy Forecasting/Trending.

About the Author

Walter O'Connell, M.E., ASA, SCSP, Senior Consultant with Porto Leone Consulting, LLC ("PLC") and is responsible for managing cost segregation studies and tangible asset valuations. He has provided these services to clients in a variety of industries for over ten years.

Prior to joining PLC, Walter worked in the manufacturing and distribution sectors as an Inventory Control Manager for Newell Rubbermaid (NYSE:CHX) and Marcolin S.p.A.. While working as an Inventory Control Manager, Walter specialized in Material Requirements Planning ("MRP") and Manufacturing Resource Planning ("MRP II"), in matters of national and international purchasing, the procurement of production equipment, plant and production design, cost allocation studies, and inventory accounting.

He has performed and managed cost segregation studies on hundreds of properties, including hotels, senior living facilities, manufacturing facilities, research & development facilities, office buildings, hospitals, and retail properties. Walter has experience in tangible asset valuations for tax, book, insurance placement, due diligence, and business planning purposes in the Healthcare, Hospitality, Manufacturing, Chemical, Food Processing, Cable and Telecommunications industries nationally.

Walter holds a Master of Arts degree in Economics from Montclair State University, Bachelor of Science degree in Finance and a Bachelor of Arts degree in Economics from Kean University. He is an Accredited Senior Appraiser ("ASA") with the American Society of Appraisers, a member of the Association of Production and Inventory Control Supervisors ("APICS"), and is an Accredited Senior Cost Segregation Professional ("SCSP") with the American Society of Cost Segregation Professionals ("ASCSP") and is a member of the American Economic Association.