

# ***Accuracy Assessment of VantagePoint Intermarket Analysis Software***

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## **Background**

This report describes the methodology applied and results obtained in an accuracy assessment I conducted of VantagePoint's Predicted Neural Index (PNI) on April 1, 2010. For this assessment, the accuracy of PNI predictions in 26 randomly selected markets was examined, using VantagePoint Version 8.2.00.803 across the time period January 2, 2008 to March 29, 2010.

VantagePoint uses neural networks to combine intermarket analysis with a market of interest's price action to provide predictive indications. The PNI is a proprietary indicator included in the software that predicts whether or not a three-day simple moving average of typical prices (average of the high, low, and closing prices) will be higher or lower two days in the future than it is on the current day. The PNI compares two three-day simple moving average values – the current moving average value and the predicted moving average value.

When the predicted three-day simple moving average value of typical prices ( $3SMA_{tp}$ ) is greater than the current  $3SMA_{tp}$ , the PNI is "1", indicating the market is expected to move higher over the next two days. When the predicted  $3SMA_{tp}$  is less than the current  $3SMA_{tp}$ , the PNI is "0", indicating the market is expected to move lower over the next two days.

## **Markets**

VantagePoint provides forecasts for over 600 markets in the categories of forex; futures; and stocks (including ETFs). The 26 markets selected for assessment spanned the categories available in VantagePoint, and are listed below.

### Forex

AUD/NZD; GBP/CHF; USD/CAD; USD/JPY

### Futures

("continuous" in all cases)

Cotton; Mini Corn; Orange Juice; Light Sweet Crude Oil; RBOB Gasoline; EMini Gold;  
EMini S&P 500; 30 year U.S. Treasury Bonds

### ETFs

iShares CS Realty Majors (ICF); iShares MSCI Emerg Mkts (EEM); iShares LEH AGG Bond (AGG);  
Financial Sector SPDR (XLF); Powershares QQQ (QQQQ); Strettracks Gold Trust (GLD);  
Vanguard Materials (VAW)

### Stocks

Dell Computer (DELL); D.R. Horton (DHI); J.B. Hunt Transport (JBHT); Kraft Foods (KFT);  
Raytheon (RTN); Southwest Water (SWWC); United Healthcare Group (UNH)

## Methodology

Daily price data provided by the Commodities Research Bureau (CRB) spanning the time period of interest for this assessment was ingested into VantagePoint. Selected columns of VantagePoint's History Report for each market were exported to Microsoft Excel for analysis. The data exported were the Date, the PNI, and the High, Low, and Closing Prices for each of the 26 markets each day. Each of these data elements were imported into separate columns in Excel spreadsheets (one spreadsheet per market).

Using Excel, for each market, the typical price for each day was calculated by averaging the day's high, low, and closing prices and stored in a new spreadsheet column. Next, the  $3SMA_{tp}$  was calculated for each day by averaging the typical price of the current day with the typical prices of the two immediately prior trading days. This  $3SMA_{tp}$  value was stored in a new column. To complete the data preparation, an additional spreadsheet column was populated with values of the  $3SMA_{tp}$  that actually occurred two days in the future. Hence, for each day, for each market, a spreadsheet contained neighboring columns containing the PNI; the day's typical price; the day's  $3SMA_{tp}$ ; and the  $3SMA_{tp}$  that occurred two trading days in the future.

PNI performance in the Long (PNI=1) and Short (PNI=0) directions was evaluated separately. For days when the PNI value was 1, a performance column was populated with a '1' if the  $3SMA_{tp}$  two days in the future was greater than the current day's  $3SMA_{tp}$ . A '0' was placed in the column if PNI was '1' and the  $3SMA_{tp}$  two days in the future was not greater than the current day's  $3SMA_{tp}$ . Additionally, this performance column was populated with a '0' if the current day's PNI value was '0'.

Similarly, a second performance column was populated with a '1' if the day's PNI was '0' and the  $3SMA_{tp}$  two days in the future was less than the current day's  $3SMA_{tp}$ . A '0' was inserted in this column if PNI was '0' and the  $3SMA_{tp}$  two days in the future was greater than the current day's  $3SMA_{tp}$ . Additionally, this performance column was populated with a '0' if the current day's PNI value was '1'.

The values contained in each performance column were summed to determine the number of correct PNI predictions in each trading direction. Excel's 'COUNTIF' function was then used to determine the number of PNI=1 days and the number of PNI=0 days that occurred in the assessment time period. The sums of the Long and Short performance columns were divided by these totals, respectively, to determine the percentage correct in each trading direction. The combined performance for all days was determined by summing the two performance columns and dividing the result by the total number of trading days evaluated, i.e., the sum of the number of PNI=1 and PNI=0 days.

## Results

As shown in the Table below, the mean combined accuracy across all 26 markets was 78.1%. The range was from 72.9% (EEM) to 82.0% (USD/CAD). Mean accuracy for the Long direction (PNI=1) was 78.8%, and mean accuracy for the Short direction (PNI=0) was 77.5%.

Although not shown in the Table, the mean combined accuracy for the 8 futures markets was 78.6%; 76.9% for the 7 ETFs; 77.8% for the 7 stocks; and 80.1% for the 4 forex pairs.

<b>MARKET</b>	<b>ACCURACY PNI=1</b>	<b>ACCURACY PNI=0</b>	<b>ACCURACY COMBINED</b>
Cotton continuous	81.6	77.4	79.5
Mini Corn continuous	77.5	79.0	78.2
Orange Juice continuous	74.0	82.1	78.0
Light Sweet Crude Oil continuous	81.7	80.9	81.3
RBOB Gasoline continuous	78.7	75.4	77.1
Emini Gold continuous	79.2	77.5	78.4
Emini S&P 500 continuous	79.5	78.6	79.1
30 Year U.S. Treasury Bonds	77.9	76.5	77.2
iShares CS Realty Majors (ICF)	75.0	76.1	75.5
iShares MSCI Emerg Mkts (EEM)	72.4	73.4	72.9
iShares LEH AGG Bond (AGG)	81.2	72.9	77.5
Financial Sector SPDR (XLF)	77.3	77.3	77.3
Powershares QQQ (QQQQ)	78.9	78.2	78.6
Streettracks Gold Trust (GLD)	77.0	74.2	75.8
Vanguard Materials (VAW)	83.2	78.4	80.7
Dell Computer (DELL)	80.5	76.5	78.4
D.R. Horton (DHI)	76.1	76.4	76.3
J.B. Hunt Transport (JBHT)	77.6	77.0	77.3
Kraft Foods (KFT)	76.7	74.4	75.5
Raytheon (RTN)	78.8	75.7	77.3
Southwest Water (SWWC)	79.4	77.6	78.4
United Healthcare Group (UNH)	79.9	82.2	81.1
AUD/NZD	82.4	75.5	79.1
GBP/CHF	77.9	80.1	79.1
USD/CAD	83.3	80.6	82.0
USD/JPY	79.8	80.2	80.0
<b>MEAN</b>	<b>78.8</b>	<b>77.5</b>	<b>78.1</b>

## Conclusions

The results of these assessments indicate the accuracy and consistency of VantagePoint's Predicted Neural Index. With only 1 exception, the overall (combined) PNI accuracy for all markets considered was found to be greater than 75%. In all but 5 of the 26 markets considered, PNI accuracy was found to be 77% or better.

## About the Author

Dr. Ted W. Warnock has nearly 30 years experience in the planning, analysis, research, development, prototyping and testing of advanced technology systems. He has earned bachelor's and Ph.D. degrees in aerospace engineering from Auburn University; a master's degree in aeronautical and astronautical engineering from Stanford University; and a master's degree in systems management from the University of Southern California. He is an engineering consultant, a retired U.S. Air Force officer, a former RAND Research Fellow, and a former Assistant Professor and Lab Director of Astronautical Engineering at the U.S. Air Force Academy. He has participated in numerous Government programs ranging from ICBM operations to advanced technology airborne and space systems development and testing, to studies and analyses of the warfighting effectiveness of information operations, to research and development of adaptive machine learning technologies and social network analysis algorithms for tactical environments. He pioneered the successful application of neural networks to the real world problem of predicting the orbital lifetimes of tethered satellites, and is an active trader who utilizes VantagePoint's predictions daily.

**Certificate**

I, Ted W. Warnock, certify that based on the methodology, markets, and assessment time period described above, VantagePoint Intermarket Analysis software produced predictive results of nearly 80% accuracy. The average predictive accuracy for the markets and time period considered was 78.1%. The methodology used in this assessment is sufficient to indicate that similar results could be expected to occur for all markets available for analysis in the VantagePoint software.

Ted W. Warnock  
Ted W. Warnock

April 5, 2010  
Date

STATE OF Virginia, COUNTY OF Fairfax

On this day personally appeared before me

Ted W. Warnock, Ph.D.

To me known to be the person described herein and who executed the foregoing instrument and acknowledged that he signed the same as his voluntary act and deed, for the uses and purposes therein described.

Witness my hand and official seal hereto affixed

This 5<sup>th</sup> day of April 2010.

Muneza Islam  
Notary Public in and for the State of Virginia



My commission expires Aug. 31, 2013.