

## **TECHNICAL ANALYZES OF DATA AND THE PREDICTION ON BVB REGARDING A MILK PRODUCT PROCESSING COMPANY**

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**Key words:** prediction, technical analysis, trading price, ROC

**Abstract:** The aim of this study is to predict the development of market price movements using the most popular technical indicators on a new type of interpretation. Technical indicators are series of data points derived by applying a formula to the price data of a security what includes any combination of the open, high, low or close prices over a period of time. This analysis can help investors to anticipate what will happen to prices over the time. We study the evolution and prediction for company ALBALACT SA Alba Iulia, symbolized ALBZ which is in Exchange segment RASDAQ, part of BVB. We are proving that a better prediction could be done using a increasing number of indicators, or using statistical analyses of data. For that we are using an indicator named Rate-of-Change (ROC) which is a centered oscillator that fluctuates above and below zero line, completed with MVSP statistical analyze of data in order to predict the evolution of prices.

### **INTRODUCTION**

Technical analysis is the study of market actions, “primarily through the use of charts, for the purpose of forecasting future price trends”(John J. Murphy)[2]. Technical analysis uses a wide variety of charts that show price over time [5].

The aim of this study is to predict the future development of market price movements for company ALBALACT SA Alba Iulia, using the most popular technical indicators. Technical analysis is built on the assumption that prices trend. Trend Lines are an important tool in technical analysis for both, trend identification and confirmation. Support and resistance represent key junctures where the forces of supply and demand meet (Hank Pruden and Max von Lichtenstein, 2006) [4] A trend line is a straight line that connects a few price points and then extends into the future to act as a line of support or resistance. Technical indicators are data points series derived by applying a formula to the price data of a security. Price data includes any combination of the open, high, low or close over a period of time. A technical indicator offers a different perspective from which to analyze the miscellaneous of price. Indicators serve three broad functions: to alert, to confirm and to predict. Many leading indicators come in the form of momentum oscillators [1]. Leading indicators generate signals and permit more opportunities to trade. Rate-of-change (ROC) is a centered oscillator that fluctuates above and below zero. The Rate of Change (ROC) indicator is a simple effective momentum oscillator that measures the percent change in price from one period to another.

### **MATERIAL AND METHOD**

The study was done on the market price historical data for June 2007 of the company ALBALACT SA Alba Iulia, ALBZ market symbol using Rate of Change (ROC) indicator and MVSP analysis. This company is in Market Exchange Segment RASDAQ.

The ROC calculation compares the current price with the price n periods ago.

$$\text{ROC} = [(\text{Today's close} - \text{Close n periods ago}) / (\text{Close n periods ago})] \times 100$$

The plot forms an oscillator that fluctuates above and below the zero line similar as the Rate of Change moves from positive to negative. The oscillator is used like any other momentum oscillator while looking for higher lows, lower highs, positive and negative divergences, and crosses above and below zero for signals.

All statistical analysis has been performed by MVSP version 3.1 software for Windows. The mean values obtained in the different groups were compared by the Diversity Indices, Cluster Analysis, Principal Coordinates Analysis and Principal Components Analysis.

Mathematically, Principal Components Analysis PCA consists of an eigenanalysis of a covariance or correlation matrix calculated on the original measurement data. Graphically, it can be described as a rotation of a swarm of data points in multidimensional space so that the longest axis (the axis with the greatest variance) is the first PCA axis, the second longest axis perpendicular to the first is the second PCA axis, and so forth. Thus these first few PCA axes represent the greatest amount of variation in the data set. When a PCA is calculated, first the covariance or correlation matrix is calculated for the variables. The correlation matrix is used if standardization is desired; this is useful if the variables have been measured on different scales or are of different orders of magnitude. An eigenanalysis is then performed on the matrix [3].

## RESULTS AND DISCUSSIONS

Using the data for month June we calculated ROC indicator (table 1) for 10 days on a 3 days ago basis calculation. With this indicator, an effective momentum oscillator, we are able to predict evolution of market values.

Table 1

ALBALACT SA Alba Iulia, (ALBZ market symbol) using Rate of Change (ROC) indicator [6]

SYMBOL	DATE	CLOSE	ROC
ALBZ	6/4/2007	1.95	-
ALBZ	6/5/2007	1.94	-
ALBZ	6/6/2007	1.91	-
ALBZ	6/7/2007	1.89	<b>-3.07692</b>
ALBZ	6/8/2007	1.89	<b>-2.57732</b>
ALBZ	6/11/2007	1.9	<b>-0.52356</b>
ALBZ	6/12/2007	1.9	<b>0.529101</b>
ALBZ	6/13/2007	1.9	<b>0.529101</b>
ALBZ	6/14/2007	1.89	<b>-0.52632</b>
ALBZ	6/15/2007	1.9	<b>0</b>
ALBZ	6/18/2007	1.89	<b>-0.52632</b>
ALBZ	6/19/2007	1.88	<b>-0.5291</b>
ALBZ	6/20/2007	1.87	<b>-1.57895</b>

The studies are showing that when ROC is crossing the zero line usually it can be considered as a BUY signal, but sometimes it may be a false signal. The most important are the trend lines and this original studies show BUY signal

A much better prediction can be done using a increasing number of indicators, or using a statistical analyze of data for more time prices (table 2).

Table 2

ALBALACT SA Alba Iulia, (ALBZ market symbol) using time prices [6]

SYMBOL	DATE	OPEN	HIGH	LOW	CLOSE	VOLUME
ALBZ	6/4/2007	1.97	1.97	1.94	1.95	499800
ALBZ	6/5/2007	1.94	1.96	1.92	1.94	173288
ALBZ	6/6/2007	1.94	1.96	1.9	1.91	95155
ALBZ	6/7/2007	1.9	1.92	1.89	1.89	94244
ALBZ	6/8/2007	1.88	1.88	1.88	1.89	53871
ALBZ	6/11/2007	1.89	1.91	1.89	1.9	122244
ALBZ	6/12/2007	1.92	1.93	1.9	1.9	162800
ALBZ	6/13/2007	1.91	1.93	1.9	1.9	298819
ALBZ	6/14/2007	1.9	1.9	1.85	1.89	108492
ALBZ	6/15/2007	1.87	1.9	1.87	1.9	76350
ALBZ	6/18/2007	1.89	1.91	1.88	1.89	73860
ALBZ	6/19/2007	1.9	1.9	1.88	1.88	63746
ALBZ	6/20/2007	1.87	1.89	1.87	1.87	46923

The statistical evaluations of data (table2) using MVSP show the followings:

1. The Diversity Indices is presenting the choosing points of a possible transaction when the price is low and the volume big (Eveness 1,004).

#### DIVERSITY INDICIES

Analysing 5 variables x 13 cases

Data will be transposed before analysis

Simpson's unbiased method, Log base 10

Sample	Index	Evenness	Num.Spec.
Open Price	0.962	1.003	13.000
High	0.962	1.002	13.000
Low	0.962	1.004	13.000
Close	0.962	1.003	13.000
Volume	0.868	0.941	13.000

2. In same way the cluster analysis is giving the same result: the one, that Volume is the most important characteristic on choosing the moment of a transaction (Fig. 1).

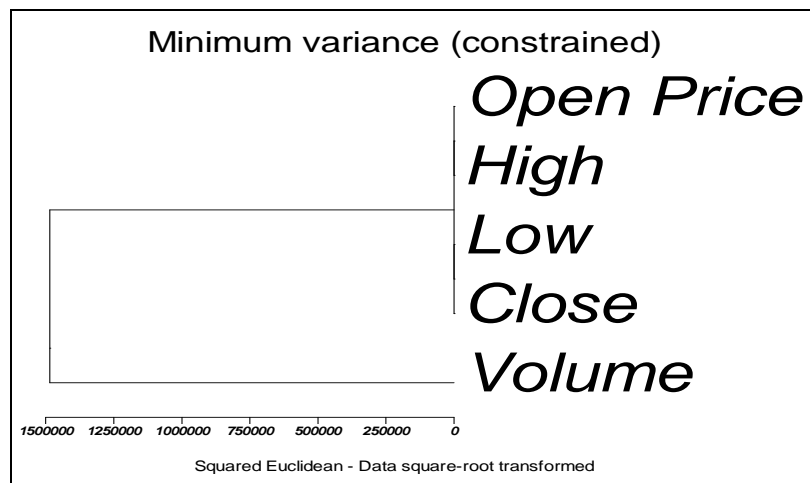


Figure 1. Cluster analysis of transactional data

## CLUSTER ANALYSIS

Analysing 5 variables x 13 cases

Data will be transposed before analysis

Data square-root transformed, Minimum variance, Squared Euclidean, Constrained clustering strategy

Objects				
Node	Group 1	Group 2	Sum of squares	in group
1	Low	Close	0.000	2
2	Open Price	High	0.000	2
3	Node 2	Node 1	0.001	4
4	Node 3	Volume	1485480.500	5

3. Principal coordinates analysis is also showing the importance of low and high price as well as volume for the selection of the buying or selling momentum (Fig 2)

## PRINCIPAL COORDINATES ANALYSIS

Analysing 5 variables x 13 cases

Data will be transposed before analysis

Data square-root transformed

Tolerance of eigenanalysis set at 1E-007

Gower General Similarity Coefficient

Similarity matrix

	Open Price	High	Low	Close	Volume
Open Price	1.000				
High	1.000	1.000			
Low	1.000	1.000	1.000		
Close	1.000	1.000	1.000	1.000	
Volume	0.000	0.000	0.000	0.000	1.000

PCO case scores

	Axis 1	Axis 2
A-Open Price	-0.283	-0.001
B-High	-0.283	-0.004
C-Low	-0.283	0.004
D-Close	-0.283	0.002
E-Volume	1.131	0.000

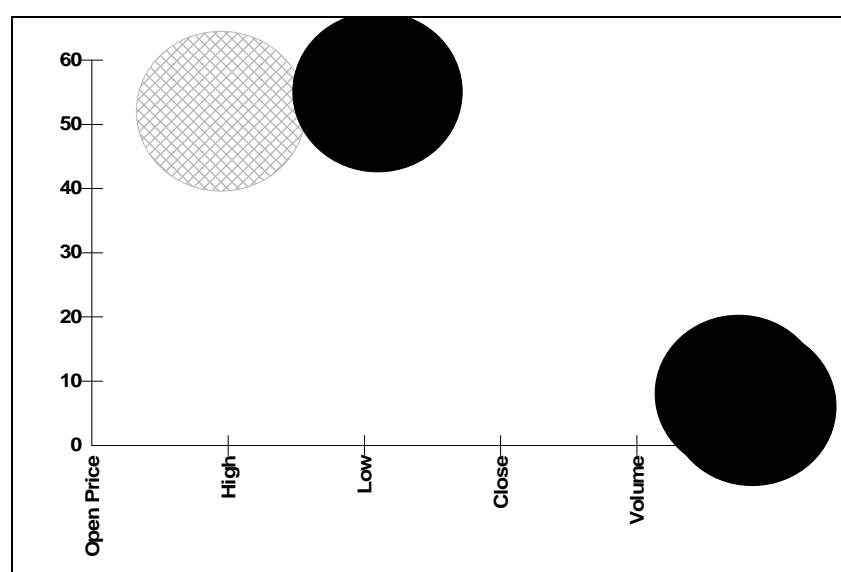


Figure 2. Principal Coordinates Analysis of transactional data

4. The PCA is showing that the best day to buy market actions of ALBZ based on open, high, low and closing price as well as volume of trading is 19.06.2007 (Fig.3).

#### PRINCIPAL COMPONENTS ANALYSIS

Analysing 5 variables x 13 cases

Data will be transposed before analysis, Tolerance of eigenanalysis set at 1E-007, Data standardized, Eigenvalues

	Axis 1	Axis 2
Eigenvalues	13.000	0.000
Percentage	100.000	0.000
Cum. Percentage	100.000	100.000

PCA variable loadings

	Axis 1	Axis 2
6/4/2007	0.289	-0.408
6/5/2007	0.289	-0.408
6/6/2007	0.289	0.816
6/7/2007	0.289	0.000
6/8/2007	0.289	0.000
6/11/2007	0.289	0.000
6/12/2007	0.289	0.000
6/13/2007	0.289	0.000
6/14/2007	0.289	0.000
6/15/2007	0.289	0.000
6/18/2007	0.289	0.000
6/19/2007	0.289	0.000

PCA case scores

	Axis 1	Axis 2
OPEN	-0.775	0.000
HIGH	-0.775	0.000
LOW	-0.775	0.000
CLOSE	-0.775	0.000
VOLUME	3.098	0.000

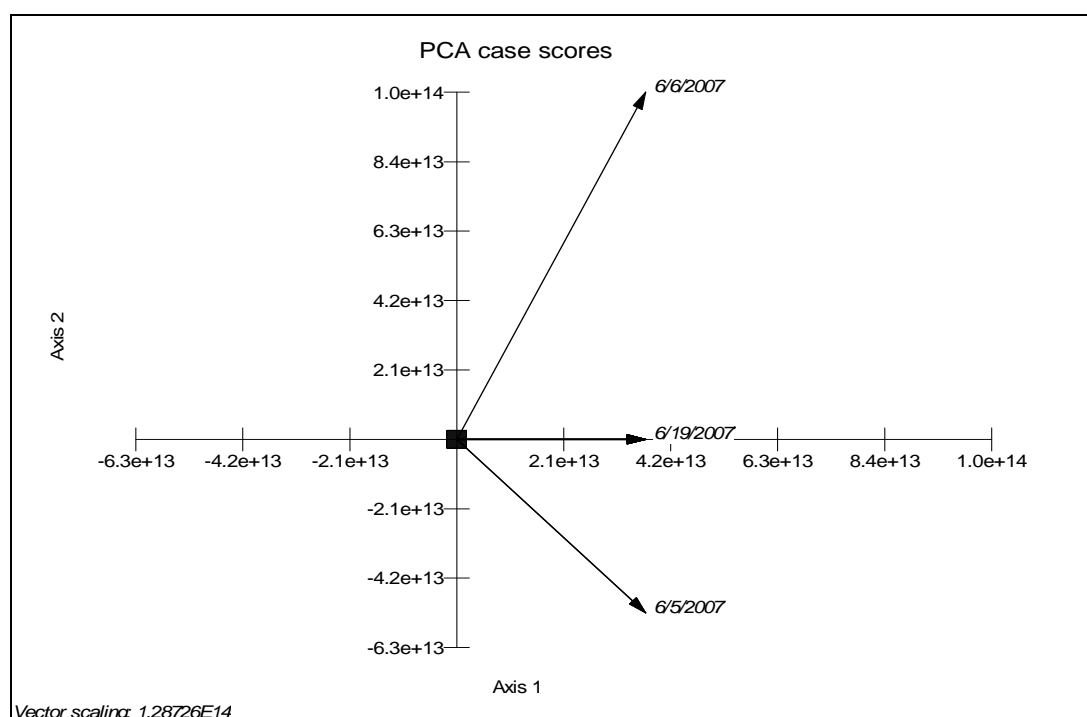


Figure 2. Principal Components Analysis of transactional data

## CONCLUSIONS

1. Oscillators are most effective when they are used in conjunction with pattern analysis, support/resistance identification, trend identification and other technical analysis tools. It is important to identify the current trend or even to ascertain if the security is trending at all. Oscillator readings and signals can have different meaning in differing circumstances.
2. By using other analysis techniques in conjunction with oscillator reading, the chances of success can be greatly enhanced.
3. MVSP seems to be a possible tool to identify the pattern and to help decide the best moment of selling or buying actions.

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