



## INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, ECONOMICS AND MANAGEMENT

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## AN EMPIRICAL ANALYSIS OF SEMI-MONTH AND TURN OF THE MONTH EFFECTS IN INDIAN STOCK MARKET

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### ABSTRACT

*The efficiency of the capital market raises various issues all over the world. Earlier research studies give evidence that the capital markets are informational efficient and hence, cannot outperform the market consistently on the basis of price change predictions. However, some researchers have also brought into light seasonal effects/calendar anomalies in the developed markets. This paper investigates one such anomaly (Semi-month and Turn of the month effects) in an emerging Indian Capital Market. The S&P CNX Nifty and BSE Sensex Index data have been collected and analyzed for a period of six years from 1<sup>st</sup> January 2005 to 31<sup>st</sup> December 2010. The analysis of the study found that the semi-month and turn of the Month Effect not exists in Indian Stock Market during the study period.*

### KEYWORDS

Capital Market, Seasonal effects / Calendar Anomalies, Monthly Effects, Semi-month Effect, Turn of the Month Effect.

### INTRODUCTION

Efficient Market Hypothesis (EMH) is one of the highly researched areas of financial economics. One of the significant anomalies of EMH is seasonal effect. It is worth nothing that testing for a seasonal effect in monthly returns has been given considerable attention in the financial literature. The existence of seasonal effect negates the weak form of the EMH and it implies market inefficiency. Several research studies and tests investigated the seasonal behavior of monthly stock market returns on all forms of EMH. Some cross sectional differences among stock returns were found to occur with regularity. These regularities in the stock returns have been termed as Anomalies. An investigation in to these anomalies can be used to frame investment strategy to outperform a naïve buy and hold strategy. The different patterns identified in stock returns include the January Effect, Day of The Week Effect, different monthly effect like Turn of the Month Effect, Semi Month Effect, the End of the Month Effect, etc.

### REVIEW OF LITERATURE

A brief review of select studies has been presented here to identify research gap and understand methodologies employed in the research area of Calendar Anomalies. **Harvinder Kaur (2004)** analyzed the nature and characteristics of stock market volatility in India and the US. The study found that the response to news arrival was asymmetrical, meaning that the impact of good and bad news was not the same. The return and volatility on various weekdays have somewhat changed after the introduction of Rolling Settlement. There was mixed evidence of return and volatility spillover between the US and Indian Markets. **B. S Badla & Kiran Jindal (2006)** investigated one of the anomalies by segmenting pre and post rolling settlement. The result of this study found that the returns of the month effect and semi monthly effect were prevalent in the Indian Stock Market. **Guneratne B Wickremasinghe (2007)** using the sample of 75 companies from Colombo Stock Exchange (CSE), found that there were no statistically significant differences among the returns for different days of the week. The analysis of this study indicates that the returns for the Month of January were not different from that of other months of the year. The study found that daily and monthly patterns of returns cannot be used to devise any method to profit from trading in shares in the Colombo Stock Exchange (CSE) **Hareesh Kumar.V and Malabika Deo(2007)** analyzed the efficiency of Indian Stock Market by using S&P CNX 500 Index. They discovered the presence of Day of the Week Effect in the Indian Stock Market, which affected both the stock returns and volatility, thereby proving the Indian Stock Market to be inefficient. **Ushad Subadar Agathee (2008)** found the average returns of Stock Exchange of Mauritius (SEM) to be the lowest in the Month of March and Highest in the Month of June. The equality of means-return tests shows that returns are statistically the same across all months. The regression analysis reveals that returns are not independent on the months of the year, except for January. **Khokan Bepari and Abu Taher Mollik (2009)** investigated the existence of seasonality in return series of DSE of Bangladesh. The study confirmed the existence of seasonality in stock returns in DSE but did not support the tax loss selling hypothesis. The study found that there was an April Effect in DSE and invalidated the paradigm of the efficient market hypothesis in DSE. **Selvarani.M and Leena Jenefa (2009)** analyzed the trends in annual returns and daily returns. A set of parametric and non-parametric tests were employed to test the equality of mean returns and standard deviations of the returns. It was found that in the NSE, there was strong evidence of April and January Effect. After the introduction of the Rolling Settlement, Friday had become significant. As far as the Day Effect was concerned, Tuesday Effect was more prevalent than Monday Effect. **Nageswari.P and Selvam.M (2010)** examined the Day-of-the Week Effect on the Indian Stock Market after the introduction of the Compulsory Rolling Settlement. It was found that the Mean Returns were positive for all days of the week, highest being on Friday for all the indices and the Day of the Week Pattern did not appear to exist in the Indian Stock Market. **Nageswari.P, Selvam.M and Karpagam.V(2011)** examined the existence of Semi-month Effect in Indian Stock Market. The study found that that the mean returns in the first half calendar month was lower than the mean returns in the second half calendar month during the study period. The paper reports an insignificant semi-monthly effect across all years except for 2005-06.

The above literature provides an overview of the presence of Monthly Effects in various Stock Markets. An attempt has been made in this study to analyze the "Analysis of Semi-Month and Turn of the Month Effects in Indian Stock Market" by taking the model from the above study.

### STATEMENT OF THE PROBLEM

The corporate, firms and Government generally release good and bad news between First half month and last half Month respectively. As a result, the bad news is reflected in lower the stock prices and good news is reflected in higher stock prices. When new positive information reaches the market, the prices become bullish due to buying pressure. The active trading strategies, based on the knowledge of market anomalies, would provide benefits to the investors; but the countervailing arbitrage will also exploit the excess return over time. In the process, observed anomalies will eventually disappear and pave the way to make the market more efficient. In general, there has been little published work on seasonalities in the Indian Stock Market. The previous researchers on the Indian Stock Market done anomalies related to day of the week or month of the year. To the author's knowledge, there has not been any published article on the semi-month and Turn of the Month effect in Indian context. In this environment, it is necessary to study the Semi-Month and turn-of the Month Effects in Indian Stock Market is significant.

### NEED OF THE PRESENT STUDY

The capital flows are taking place on a massive scale to India in order to capitalize the promising profitable opportunities. The international investors are concerned with the market efficiency, timing of investment, and the market integration with other developed countries. The present study would be useful to the investors, traders and arbitrageurs who could formulate profitable trading strategies if they were able to predict the share price behavior with full information on these anomalies. The share price behavior in one market spreads slowly to the other developing and developed markets. Since the presence of Calendar Anomalies in these markets was proven, these anomalies should be investigated in India. Such detailed investigation of the Calendar Anomalies like Day-of- the Week Effect, Turn-of-the Month Effect and Monthly Effect in the Indian Markets would help the international and Indian investors to plan their investment.

### OBJECTIVES OF THE STUDY

The present study intends to accomplish the following objectives

- To identify the Turn of the Month Effect in the Indian Stock Market.
- To measure the Semi-Month Effect prevalent in the Indian stock market.
- To summarize the findings, Suggestions and Conclusions.

### HYPOTHESIS OF THE STUDY

The following two hypotheses were tested in this study.

NHo1: There is no significant difference between the returns of the first half month and rest of the month.

### METHODOLOGY OF THE STUDY

#### A) SAMPLE SELECTION

For the purpose of this study, S&P CNX Nifty and BSE Sensex Index were considered as sample since these two indices are important indices of the Indian Stock Market in India. Besides, these indices are considered to be the best indicators of the performance of the whole economy. Hence, this study considered these Indices.

#### B) SOURCES OF DATA

The required information for the present study were the daily closing prices of S&P CNX Nifty Index and BSE Sensex and they were collected from the Prowess, which is a corporate database maintained by CMIE.

#### C) PERIOD OF THE STUDY

The present study covered a period of Six-years from 1<sup>st</sup> January 2005 to 31<sup>st</sup> December 2010.

#### SEMI-MONTH EFFECT

In the case of the semi-monthly effect, the mean return of the first half month has been compared with the average return of the rest of the days. For the purpose of this study, the return of first 15 days (1-14 days of the current month and 30th & 31st days of the preceding month) have been compared with rest of the month.

#### TURN OF THE MONTH EFFECT

The tendency of stock prices to increase during the last two days and the first three days of each month, is called Turn of the Month Effect. For the purpose of this study, the average of the return on last two trading days of the month, and the first three days of the subsequent month has been computed and compared with the mean return for the rest of the days in the subsequent month.

#### TOOLS USED FOR ANALYSIS

In this study, independence of return series was investigated for Nifty and Sensex Index. The following were calculated,

##### i) Returns

To compute daily returns for each of the index series as the continuously compounded daily percentage change in the Closing value index as given below:

$$R_t = \ln \left[ \frac{I_t}{I_{t-1}} \right] * 100$$

Where,

$R_t$  = Daily return on the Index (I),

$\ln$  = Natural log of underlying market series (I),

$I_t$  = Closing value of a given index (I) on a specific trading day (t), and

$I_{t-1}$  = Closing value of the given index (I) on preceding trading day (t-1).

##### ii) Mean

Mean is the average value of the series, obtained by adding up the series and dividing by the number of observations. It is the most common measure of central tendency.

$$Mean = \frac{1}{n} \sum_{i=1}^n X_i$$

Where,

$\bar{x}$  = represents the mean.

$\sum$  = Symbol of Summation

$X_i$  = Value of the  $i^{th}$  item  $x$ ,  $i = 1, 2, 3 \dots n$

$n$  = total Number of items

**iii) T - Test**

The t-test compares the actual difference between two means in relation to the variation in the data (expressed as the standard deviation of the difference between the means).

$$t = \frac{(\bar{X} - \bar{Y})}{\sqrt{\frac{n(n-1)}{\sum_{i=1}^n (\hat{X}_i - \hat{Y}_i)^2}}}$$

$$\hat{X}_i = (x_i - \bar{X}), \hat{Y}_i = (y_i - \bar{Y}),$$

Where,

$X_i$  and  $Y_i$  are paired sets,  $n$  = number of years.

**iv) OLS Regression Model**

In order to test the equality of mean returns across halves of calendar months, the following ordinary least squares (OLS) regression is run for the period 2005 to 2010:

$$R_t = B1 + B2D1t + ut$$

where  $D1t = 1$  if day  $t$  is in the second half of a calendar month (exclusive of the fifteenth day of a month), and 0 otherwise. The OLS coefficient  $B1$  is the mean returns corresponding to the first half of calendar months while the estimate of  $B2$  is equal to the difference between the sample means of the first and second halves of calendar months. The stochastic disturbance term is indicated by  $ut$ . The null hypothesis to be tested is:  $B2 = 0$

**ANALYSIS OF SEMI-MONTH AND TURN OF THE MONTH EFFECTS IN SELECTED SAMPLE INDEX RETURNS**

For the purpose of the analysis, the Semi-month and Turn of the month Effect in Index returns were classified as follows,

**A. Analysis of BSE Sensex Index returns for the period from January 2005 to December 2010**

1. Analysis of Semi monthly Effect in BSE Sensex Returns
2. Results of OLS Regression Model of Semi-month Effect
3. Analysis of Turn of the month Effect BSE Sensex Returns, and
4. Results of OLS Regression Model of Turn of the month Effect
- B. Analysis of S&P CNX Nifty Index Returns for the period from January 2005 to December 2010
5. Analysis of Semi monthly Effect in S&P CNX Nifty Returns.
6. Results of OLS Regression Model of Semi-month Effect
7. Analysis of Turn of the month Effect in S&P CNX Nifty Returns, and
8. Results of OLS Regression Model of Turn of the month Effect

**A. ANALYSIS OF BSE SENSEX INDEX RETURNS FOR THE PERIOD FROM JANUARY 2005 TO DECEMBER 2010**

**1. ANALYSIS OF SEMI MONTHLY EFFECT IN BSE SENSEX RETURNS**

The analysis of semi-month effect in BSE Sensex index returns from January 2005-December 2010 is presented in **Table-1**. The analysis clearly shows that there was highest (0.0967) mean return recorded for the first half month than the Second half (0.0465). This indicates that the corporate may announce the positive information during the first half month period. The highest value (1.9244) and lowest value (1.7545) of standard deviation recorded for the second and first half month respectively. The highest value of standard deviation with lowest mean return revealed there was non-linear relationship between the return and risk in BSE Sensex returns during the study period.

The peak of return distribution was platykurtic for the first half and leptokurtic for the second half month returns and highest (9.96) for the second half of the return series. The return was negatively skewed for first half month and positively skewed for second half month returns during the study period. The t-test statistic value is less than the t critical value both one and two tail test and the p-value shows that there was no significant difference between the returns of first half and rest of the days of the month. It is observed that the semi-month effect does not exist in BSE Sensex index returns during the study period. Hence, the null hypothesis (NHo1), namely, "There is no significant difference between the returns of the first half month and second of the month," is accepted.

**TABLE -1: ANALYSIS OF SEMI MONTHLY EFFECT IN BSE SENSEX FOR THE PERIOD FROM 01.01.2005-31.12.2010**

Statistics	First Half	Second Half
Mean	0.096753	0.046561
Standard Deviation	1.754554	1.924416
Kurtosis	2.630503	9.962015
Skewness	-0.22093	0.354016
Observations	821	667
df	1486	
t Stat	0.525405	
P(T<=t) one-tail	0.29969	
t Critical one-tail	1.64588	
P(T<=t) two-tail	0.59938	
t Critical two-tail	1.961562	

Source: Computed from PROWESS

**2. ANALYSIS OF OLS REGRESSION MODEL OF SEMI-MONTH EFFECT IN BSE SENSEX RETURNS**

**Table-2** shows the results of OLS Regression Model of semi-month Effect in BSE Sensex returns for the period of 1<sup>st</sup> January 2005 to 31<sup>st</sup> December 2010. The above table clearly revealed that the there was negative coefficient and t-statistic value recorded for the second half month and positive coefficient and t-statistic value recorded for the first half month return during the study period. The insignificant p-value found that there was no significant difference between the first half and rest of the days of the month. . R2 is 0.00018 which is very low, and F-statistic indicates that the overall fit of the model is poor. Further, Durban-Watson statistic of 1.96 indicates autocorrelation in the residuals.



**TABLE-2: RESULTS OF OLS REGRESSION MODEL OF SEMI-MONTH EFFECT IN BSE SENSEX RETURNS**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Second Half	-0.0131	0.0380	-0.3457	0.7297
C	0.0788	0.0730	1.0798	0.2806
Adjusted R-squared	0.00018	F-statistic		0.1195
Durbin-Watson stat	1.9668	Prob(F-statistic)		0.7297

Source: Computed from PROWESS

**3. ANALYSIS OF TURN OF THE MONTH EFFECT IN BSE SENSEX RETURNS**

The analysis of Turn of The Month Effect in BSE Sensex Returns for the period from January 2005 to December 2010 is given in **Table-3**. The results indicate that the index returns on first half (0.2414) was higher than that of second half (0.0248). The value of standard deviation of the return was 1.7312 in the first half. But in the second half, it (1.8592) was higher than that of the first half. This shows that there was inverse relationship between risk and return of the series. That is high return was associated with low risk.

The high and positive t-statistic value found that there was significant difference between the returns of first half and rest of the days of the month at 5% significant level. The present study identified the Turn of The Month Effect in the Indian Stock Market during the study period. Hence, the null hypothesis (NHo1), namely, "There is no significant difference between the returns of the first half month and rest of the month," is rejected

**4. ANALYSIS OF OLS REGRESSION MODEL OF TURN OF THE MONTH EFFECT**

The results of OLS Regression Model of Turn of the month Effect in BSE Sensex returns for the period of 1<sup>st</sup> January 2005 to 31<sup>st</sup> December 2010 is exhibited in **Table-4**. The table shows that the coefficient and t-statistic value of the first half month return was higher than that of the rest of the days of the month. The first half month return significantly different from zero at 1% level during the study period. The significant p-value found that there was significant difference between the first half and rest of the days of the month. R-squared is very low, and F-statistic indicates that the overall fit of the model is poor. Further, Durban-Watson statistic of 1.97 indicates autocorrelation in the residuals.

**TABLE -3 ANALYSIS OF TURN OF THE MONTH EFFECT IN BSE SENSEX DURING 2005-2009**

Statistics	First Half	Second Half
Mean	0.2414831	0.0248252
Standard Deviation	1.7312173	1.8592363
Kurtosis	2.6612443	7.6423191
Skewness	-0.270817	0.1700481
Observations	359	1130
df	1487	
t Stat	<b>1.9543055*</b>	
P(T<=t) one-tail	0.0254261	
t Critical one-tail	1.645879	
P(T<=t) two-tail	0.0508523	
t Critical two-tail	1.9615606	

Source: Computed from PROWESS

\*Significant at 5% level

**TABLE-4: RESULTS OF OLS REGRESSION MODEL OF TURN OF THE MONTH EFFECT IN BSE SENSEX RETURNS**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Second Half	0.0430	0.0644	0.6673	0.5050
C	0.2359*	0.0914	2.5808	0.0103
R-squared	0.001245	F-statistic		0.4453
Durbin-Watson stat	1.9708	Prob(F-statistic)		0.5050

Source: Computed from PROWESS

\*Significant at 5% level

**B. ANALYSIS OF S&P CNX NIFTY INDEX RETURNS**

**5. ANALYSIS OF SEMI MONTHLY EFFECT IN S&P CNX NIFTY INDEX RETURNS**

The analysis of Semi-Month Effect of S&P CNX Nifty Index for the period of January 2005 to December 2010 is given in **Table-5**. The mean returns of first half (0.0937) was higher than that of the second half month (0.0460). But, the standard deviations of return series were 1.707 for the first half and 1.966 for the second half month. The peak of the return distribution was platykurtic for the first half month and leptokurtic for the second half month return series. Highest kurtosis (11.00) recorded for the second half month return series indicates the non normality of the return distribution. The return distribution positively skewed for second half and negatively skewed for the first half month returns.

The lowest and insignificant t-test statistic value reveal that there was no significant difference between the returns of first half and second half month returns series. Hence, the null hypothesis (NHo1), namely, "There is no significant difference between the returns of the first half month and rest of the month," is accepted.

**TABLE -5: ANALYSIS OF SEMI MONTHLY EFFECT IN S&P CNX NIFTY INDEX DURING 2005-2009**

Statistics	First Half	Second Half
Mean	0.093736	0.046064
Standard Deviation	1.707764	1.965942
Kurtosis	2.201344	11.00796
Skewness	-0.30031	0.171453
Observations	823	666
Df	1487	
t Stat	0.500101	
P(T<=t) one-tail	0.308539	
t Critical one-tail	1.645879	
P(T<=t) two-tail	0.617078	
t Critical two-tail	1.961561	

Source: Computed from PROWESS

**6. ANALYSIS OF OLS REGRESSION MODEL OF SEMI-MONTH EFFECT IN S&P CNX NIFTY INDEX RETURNS**

**Table-6** shows the OLS Regression results of Semi-month effect in S&P CNX Nifty index returns for the period of January 2005 to December 2010. The co-efficient value and t-statistic value of the first half month return was positive but the second half month return and t-statistic value was recorded negative co-efficient value. The insignificant F-value showed that there was no significant difference between the returns first half and rest of the days of the month.

**TABLE-6: RESULTS OF OLS REGRESSION MODEL OF SEMI-MONTH EFFECT IN S&P CNX NIFTY INDEX RETURNS**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Second Half	-0.0084	0.0360	-0.2346	0.8146
C	0.0694	0.0708	0.9801	0.3273
R-squared	0.00014	F-statistic		0.0550
Durbin-Watson stat	1.9968	Prob(F-statistic)		0.8145

**7. ANALYSIS OF TURN OF THE MONTH EFFECT IN S&P CNX NIFTY INDEX RETURNS**

The analysis of the Turn of the Month Effect in S&P CNX Nifty Index for the study period from January 2005 to December 2010 is presented in **Table-7**. It is understood that the S&P CNX Nifty Index returns of the first half (0.2302) was higher than that of the second half (0.0238) but the standard deviation of the return in the first half was lower (1.69) than that of the second half (1.867). It indicates that the market was more volatile for the second half month and least volatile for the first half month return during the study period. The kurtosis measure of the return distribution was platykurtic for the First half month return and leptokurtic for the second half month return. It is found that the return was normally distributed for the first half month only. The return distribution was negatively skewed for the first half month and positively skewed for the second half month return during the study period. The t-test statistic value was significant at 5% level on one tail test. It indicates that the Turn of the Month Effect exists in S&P CNX Nifty Index returns during the study period.

**TABLE -7: ANALYSIS OF TURN OF THE MONTH EFFECT IN S&P CNX NIFTY INDEX DURING 2005-2009**

Statistics	First Half	Second Half
Mean	0.230213	0.023849
Standard Deviation	1.690917	1.866582
Kurtosis	2.103058	8.703816
Skewness	-0.41222	0.055134
Observations	359	1130
Df	1487	
t Stat	<b>1.865013*</b>	
P(T<=t) one-tail	0.031188	
t Critical one-tail	1.645879	
P(T<=t) two-tail	0.062376	
t Critical two-tail	1.961561	

Source: Computed from PROWESS

\*Significant at 5% level

**8. ANALYSIS OF OLS REGRESSION MODEL OF TURN OF THE MONTH EFFECT IN S&P CNX NIFTY INDEX RETURNS**

The OLS Regression results of Turn of the month effect in S&P CNX Nifty index returns for the period from January 2005 to December 2010 is shown in **Table-8**. The table examined the insignificant positive co-efficient value and t-statistic value recorded for the second half month return and high positive significant co-efficient and t-test statistic value recorded for the first half month return. The first half month return was significant at 5% level. It found that there was significant difference between the returns first half and rest of the days of the month. But the insignificant F-value revealed that there did not find any seasonality for the S&P CNX Nifty index returns during the study period.

**TABLE-8: RESULTS OF OLS REGRESSION MODEL OF TURN OF THE MONTH EFFECT IN S&P CNX NIFTY INDEX RETURNS**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Second half	0.0208	0.0619	0.3367	0.7365
C	0.2271	0.0892	2.5439*	0.0114
R-squared	0.000232	F-statistic		0.1134
Durbin-Watson stat	2.0111	Prob(F-statistic)		0.7364

Source: Computed from PROWESS

\*Significant at 5% level

**FINDINGS AND SUGGESTIONS OF THE STUDY**

The following are the major findings of the study

- The analysis of the selected indices (BSE Sensex and S&P CNX Nifty) showed that highest mean returns was recorded for the first half month than the rest of the days of the month. The one of the possible reason may be the salaried people who get and invest their salaries during this period.
- So it is suggested that the investors should invest either on the first or last trading days of the month. It will give better returns than the other trading days of the month.
- The study found out the the highest value and lowest value of standard deviation recorded for the second and first half month respectively for both the selected indices.
- The highest value of standard deviation with lowest mean return found out that there was non-linear relationship between the return and risk in selected indices returns during the study period.
- The peak of the return distribution was platykurtic for the first half month and leptokurtic for the second half month return series.
- It indicates that the return distribution normally distributed for the first half month return and non- normality of the second half month return series of the selected sample indices during the study period.
- The return distribution is positively skewed for second half month and negatively skewed for the first half month returns for both the BSE Sensex and S&P CNX Nifty index during the study period.
- The t-test statistic value is less than the t critical value for both one and two tail test and the p-value shows that there was no significant difference between the returns of first half and rest of the days of the month. Hence, Semi Monthly Effect did not exist in Indian Stock Market.
- It is found that the semi-month effect does not exist in BSE Sensex and S&P CNX Nifty index returns during the study period.
- The analysis of the Turn of The Month Effect shows that there was significant difference between the returns of the first and the second half return series. But the insignificant F-value revealed that there did not find any seasonality for the selected sample index returns during the study period.
- The study found that there was inverse relationship between risk and return of the series. That was high (low) return was associated with lower (high) risk.

## CONCLUSION

This paper examined the existence of Semi-month and Turn of the Month Effect (a calendar anomaly) for S&P CNX Nifty and BSE Sensex in the Indian Stock Market. The finding of the Study shows that the Semi-month and Turn of the Month Effect was not prevalent in the Indian Stock Market during the study period. By analyzing these anomalies in Indian Stock Market, it is concluded that most of the cash flows come in to the Indian Stock Market in the first few days of the month, which induces stock prices to move upward. Hence, the Indian Stock Market cannot be treated as fully efficient till now. The existence of these anomalies may provide opportunities to formulate profitable trading strategies so as to earn the abnormal return.

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