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## **A Comparative Study on Success Rate of Two Technical Indicators Pertaining to Crude Oil Trading in the Global Commodity Market**

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### **Abstract:**

*This article takes a comprehensive look at the performance of Japanese Candlestick and Relative strength index forecasting returns. This paper aims at carrying out variation of two Technical indicator methods, especially selected commodity as 'Crude Oil' and to assist investment decisions on crude oil in the Global Commodity Market. The main intention of analysis is to generate optimum returns by the shareholder, to decide when to enter and exit in the commodity trading. It helps to understanding the intrinsic value of commodity and knowing whether the commodities are undervalued or overvalued. Technical analysts believe that the historical performances of Commodities markets are indications of future performance. Majorly we have chosen some basic technical indicators offered at commodity market and others. In this study, we considered first quarter of the 2015 with intra-day trading. Finally, results drawn Japanese Candlestick does provide predictive information in both in-sample and Out-of-sample also there is significant information dispersed from the global commodity market to the other derivative markets. Theoretical knowledge framework added to the contingency strategy that gives key to good results and positive trading, which is again proved here in this study. This study also analyzes where the optimal success rates are deploying weather in RSI or CANDLESTICK.*

**Keywords:** Global commodity market, Theoretical framework, Success rate, Predictive information.

### **1. Introduction**

Crude oil is one of the most economically mature commodity markets in the world. Even though most crude oil is produced by a relatively small number of companies, and often in remote locations that are very far from the point of consumption, trade in crude oil is robust and global in nature. Nearly 80% of international crude oil transactions involve delivery via waterway in supertankers. Oil traders are able to quickly redirect transactions towards markets where prices are higher. Thus, global supply and demand determines prices for these energy sources. Events around the world can affect our prices at home for oil-based energy such as gasoline and heating oil. Oil prices are high right now because of rapidly growing demand in the developing world (primarily Asia). As demand in these places grows, more oil cargoes head towards these countries. Prices in other countries must rise as a result. Political unrest in some oil-producing nations also contributes to high prices - basically, there is a fear that political instability could shut down oil production in these countries. OPEC, the large oil-producing cartel, does have some ability to influence world prices, but OPEC's influence in the world oil market is shrinking rapidly as new supplies in non-OPEC countries are discovered and developed.

#### *1.1. Crude oil in Trading*

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these places grows, more oil cargoes head towards these countries. Prices in other countries must rise as a result. Political unrest in some oil-producing nations also contributes to high prices - basically, there is a fear that political instability could shut down oil production in these countries. OPEC, the large oil-producing cartel, does have some ability to influence world prices, but OPEC's influence in the world oil market is shrinking rapidly as new supplies in non-OPEC countries are discovered and developed.

### *1.2. Global Demand on Crude Oil*

World oil demand growth for 2014 was kept broadly unchanged from last month's MOMR at a level of 0.96 mb/d, with total oil demand anticipated to reach 91.15 mb/d. In 2015, world oil demand is projected to grow at a marginally higher 20 tb/d over last month's report, supported by an upward revision of 15 tb/d recorded in OECD Americas. As a result, 2015 total oil demand growth currently stands at 1.17 mb/d with total oil consumption projected to reach 92.32 mb/d. World oil demand in 2014 and 2015 Table 4.1: World oil demand in 2014, mb/d OECD Americas The most recent monthly US oil demand data covers November 2014 and implies y-o-y losses in oil requirements of around 1% after an increase in October 2014 and an overall flat 3Q14 in terms of growth. Preliminary weekly data for November led to optimistic expectations, which had to be revised downwards substantially once monthly data became available. Growth in November gasoline demand was slow, despite relatively low fuel prices, while distillate fuel demand fell slightly. Moreover, residual fuel oil and propane/propylene requirements remained on a downward trend for another month in 2014.

## **2. Literature Review**

This chapter is divided into two main parts: explanations of terms and concepts found later in the literature reviews and a survey of literature reviews on candlesticks and RSI ANALYSIS

Taylor and Helen (1992) find that around 90 per cent depends on technical analysis in forming their views at different time horizons. The results show that technical analysis is applied mainly for the shorter time frames for entry and exit timings. Moreover, technical analysis tools are found to be the best tools for trading currencies.

Levichand Thomas (1994) examines the "impact of technical trading strategies in the foreign exchange market." by using futures contracts of a 15-year time span. Their data sample covers the years from 1976 to 1990. After applying bootstrap methodology, reveal that technical trading systems are significantly profitable his empirical results of profit significance in both original series and randomly generated series are compared.

Gencay (1997) also finds strong evidence of profitable simple technical trading rules in daily Dow Jones Industrial Average Index. He had examined linear and nonlinear predictability of stock market return using historical buy and sell signals of the RSI rules.

LeBaron (1998) reviews some evidence that shows the predictive value over future foreign exchange prices. His forecasts are assessed over one day and one week periods. His sample uses weekly and daily foreign exchange rates.

Marshall Young and Rose (2005) study the candle patterns in actively traded stocks listed in the DJIA. The sample includes data from 1992 to 2002; the starting year is selected to make sure that market participants had basic background of the different Japanese candle trading rules and they already started using them at that time in their trading strategies. The sample includes 28 candle patterns that fall under four main categories: bullish single lines, bullish reversal patterns, bearish single lines and bearish reversal patterns. To test the results, they use the bootstrap methodology to generate random prices of open, high, low and close. Contrary to the researchers' expectations, the final results show no evidence of profitable candle patterns in DJIA, thus, supporting the weak form of the EMH.

Shik and Chong (2007) also find technical trading rules profitable in foreign exchange markets. They apply moving averages and Relative Strength Index (RSI) using daily rates of six foreign currencies. They find that the profitability of using moving averages is obvious even though the currencies belong to various economic areas. He also finds out that the technical rules correlate positively with the interventions of the central banks. There is little attention given to the Japanese candlestick patterns in the literature even though they were widely used in rice trading activities in Japan, and have been found very powerful when combined with other technical trading rules (Nison, 2003).

Cekirdekci and Iliev (2010) test different set ups as well as exit strategies for trading opening range breakouts of 30-minute time frame. The research examines a technical trading system using and back tests of around 250 stocks from various industry sectors, from April 2005 to April 2010. The initial tested set ups include buy and sell filters, inside bar, simple and exponential moving averages, a volume indicator, percent trailing exist, overbought and oversold areas of Relative Strength Index and ATR Ratchet. The results show that, when combining buy and sell signals with other indicators, such as the volume indicator, the opening range is a powerful model; it generates significant returns when traded with the correct stock.

Similarly, Holmberg, Lönnbark and Lundström (2012) test the profitability of the trading strategy of the "Open Range Breakout (ORB), but in the US crude oil futures prices from March, 1983 to January, 2011. The ORB is a trading rule that signals entry and exit rules once the price moves beyond predefined boundaries. Using the joint distribution of low, high, open and close prices over a period of time, the researchers find that their ORB trading rule significantly generates high returns. Interestingly, some researchers have conducted different types of studies to have an indication of how widely technical analysis is applied in the financial field. Lana, Zhanga and Xiongb (2011) develop a model that visualizes Japanese candlestick patterns in Chinese stock markets. The model transforms the prices of open, close, high and low into "fuzzy" candle charts. The sample includes selected stocks listed in four markets: "SSE A Share, SSE B Share, Shenzhen A share and Shenzhen B share" from January 2000 to December 2010. The results show that the model is able to identify the reversal patterns and that it can be used to identify early stock reversal signals through

“symptoms sequence”. The researchers will further enhance the model with additional fuzzy variables to reflect candlestick lines, such as the position of body and shadows to fine-tune the prediction results.

### 3. Significance of the Study

Commodities markets, both historically and in modern times, have had a tremendous economic impact on nations and people. Energy commodities such as crude oil are closely watched by countries, corporations and consumers alike. Although the quality of product, date of delivery and transportation methods were often unreliable, commodity trading was an essential business. Commodities can quickly become risky investment propositions because they can be affected by eventualities that are difficult, if not impossible, to predict.

### 4. Statement of the Problem

The emergence and growth of derivative market have been witnessed by increased risk in the financial market. The derivatives market hedge the risk of traders, by providing a risk management tool in the market. It is characterized by high volatility in terms of prices and volume of contracts in the market. The commodity derivatives are the first instrument used to secure the farmers and respective business merchants by protecting them against the price risk. Identifying the right tool to hedge will help the participants get better profits.

### 5. Objectives of the Study

- i. To analyze the success rates of candlestick and relative strength index indicators on crude oil trading globally.
- ii. To provide a precise summary and conclusion to crude oil trading in commodity markets.

### 6. Methodology

In this study both primary and secondary data used to meet the cited objectives. Primary data collected through personal observation on selected commodities of crude oil from first quarter of 2015 with intra-day trading. Whereas, secondary data collected from published reports, journals and official websites. Data analyzed with candlesticks analysis and relative strength index for comparing the outcome accuracy of the both tools.

### 7. Data Analysis & Interpretation

The data collected for Japanese candle sticks namely DOJI, HAMMER, and INVERSE HAMMER and also for relative strength index as given below:

#### 7.1. Candlesticks Analysis

Gross Profit	Gross Loss	Net Profit
24277.4354	-8558.2525	15719.1829

Table 1: Doji Candlestick analysis (Profit)

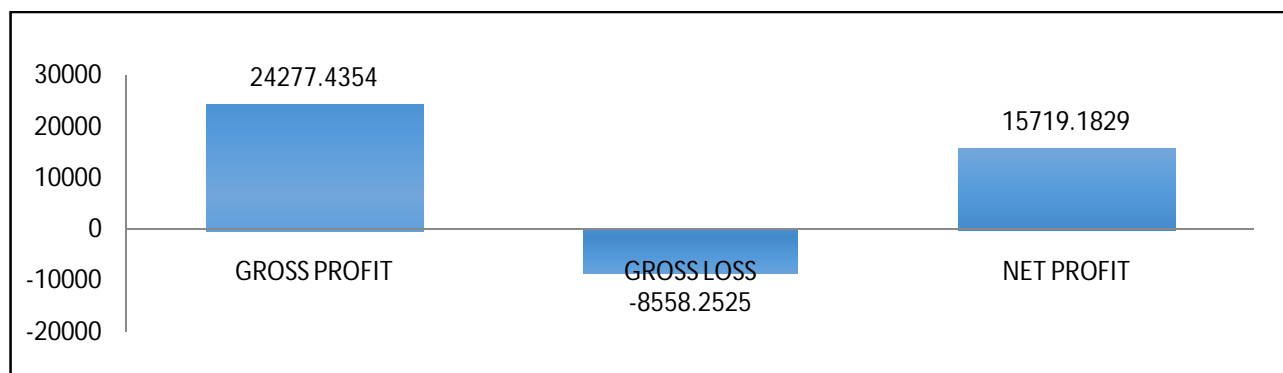


Figure 1: DOJI candlestick

It is noticed that the doji candlestick is carried a high level of gross profit (24277.5) and a low status of gross loss (-8558.2) as shown in above figure. At last, it has given an above average net profit (i.e., 15719.18).

Total Number of Samples	Number of Success	Number of Failures	Success Rate (%)
50	39	11	78

Table 2: Doji Candlestick analysis (Success Rate)

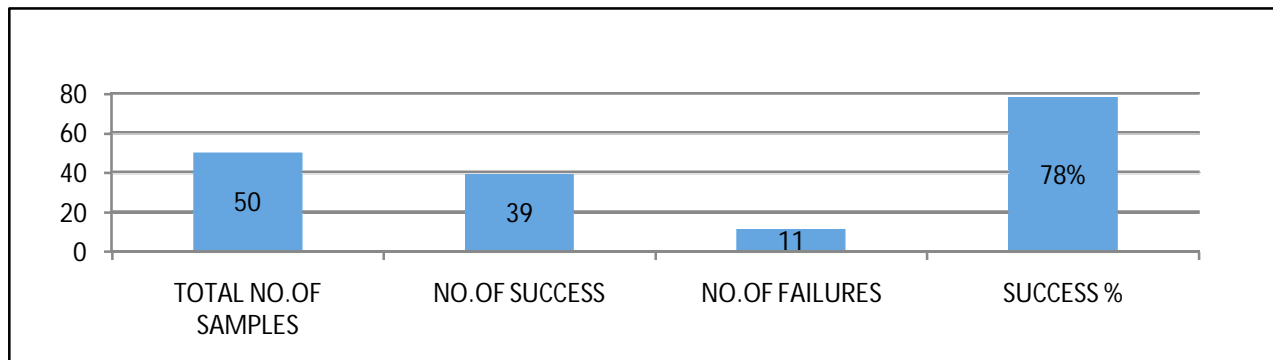


Figure 2: Doji candlestick

It is evident that the doji candlestick is carried a high number of successes (39) and a low number of failures (11) among total 50 sample as shown in above figure. At last, it has given an above average success rate (i.e., 78%).

Gross Profit	Gross Loss	Net Profit
33901.56	11303.92	22597.64

Table 3: Hammer Candlestick analysis (Profit)

It is noticed that the hammer candlestick is carried a high level of gross profit (34580.7) and a low status of gross loss (-11303.92) as shown in above figure. At last, it has given an above average net profit (i.e., 23276.78).

Total Number of Samples	Number of Success	Number of Failures	Success Rate (%)
50	40	10	80

Table 4: Hammer Candlestick analysis (Success Rate)

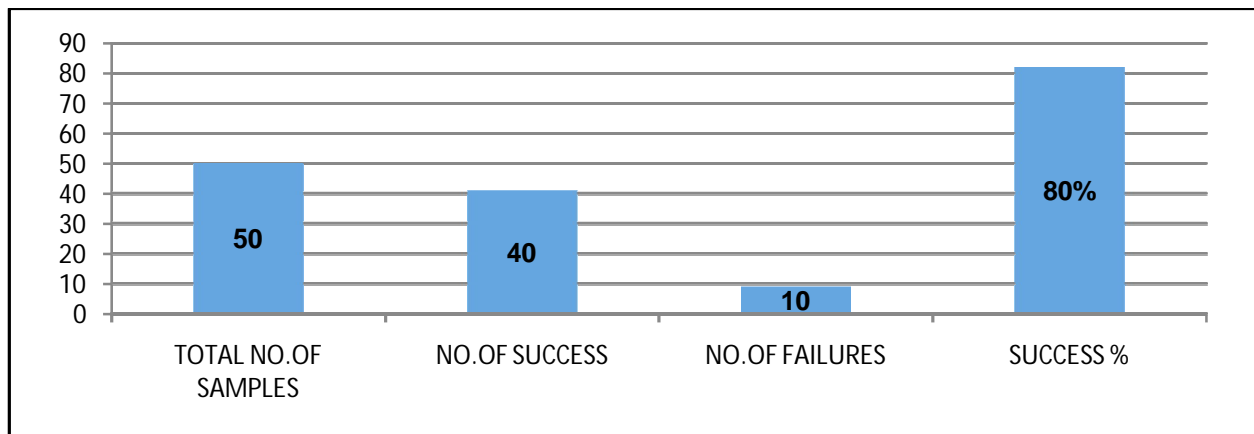


Figure 3: Hammer candlestick

It is noticed that the hammer candlestick is carried a high number of successes (40) and a low number of failures (10) among total 50 sample as shown in above figure. At last, it has given an above average success rate (i.e., 82%).

Gross Profit	Gross Loss	Net Profit
29063.03	-11152.13	17910.9

Table 5: Inverse Hammer Candlestick analysis (Profit)

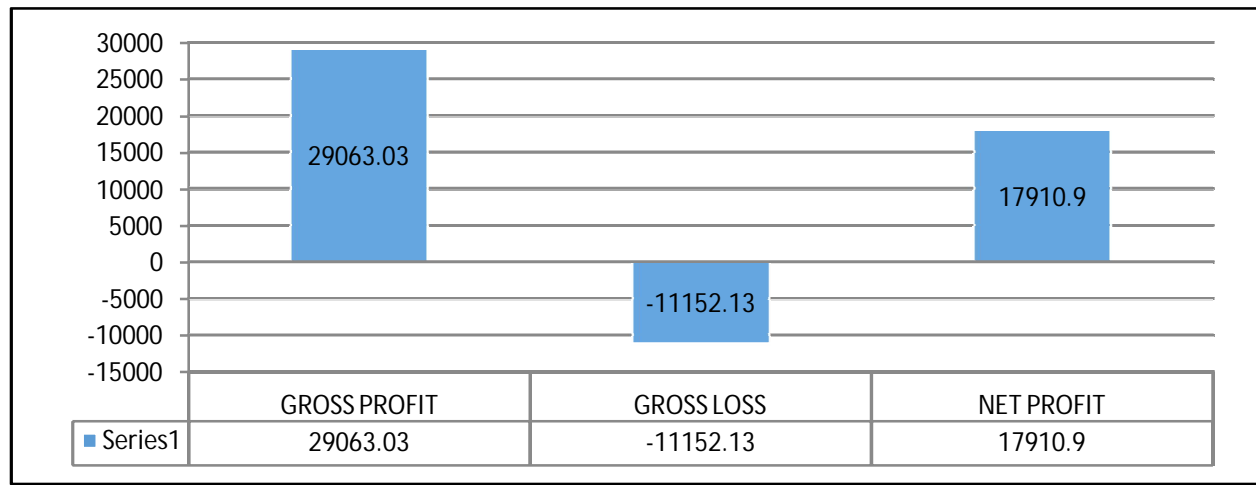


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It is noticed that the Inverse hammer candlestick is carried a high level of gross profit (29063.03) and a low status of gross loss (-11152.13) as shown in above figure. At last it has given an above average net profit (i.e., 17910.9).

Total Number of Samples	Number of Success	Number of Failures	Success Rate (%)
50	35	15	70

Table 6: Inverse Hammer Candlestick analysis (Success Rate)

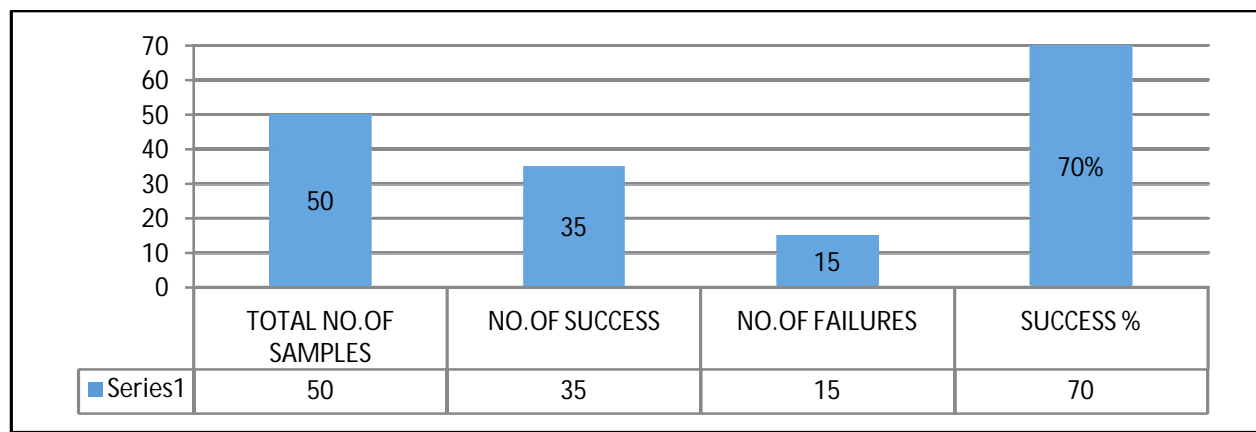


Figure 5: Inverse Hammer

It is noticed that the Inverse hammer candlestick is carried a high number of successes (35) and a little bit high number of failures (15) among total 50 sample as shown in above figure. At last, it has given a nominal success rate (i.e., 70%).

7.2. Relative Strength Index

Gross Profit	Gross Loss	Net Profit
335276.0115	-75280.6112	259995.4003

Table 7: Relative Strength Index analysis (Profit)

It is noticed that the Inverse hammer candlestick is carried a high level of gross profit (335276.01) and a low status of gross loss (-75280.61) as shown in above figure. At last, it has given an above average net profit (i.e., 259995.40).

Total Number of Samples	Number of Success	Number of Failures	Success Rate (%)
50	37	13	74

Table 8: Relative Strength Index analysis (Success Rate)

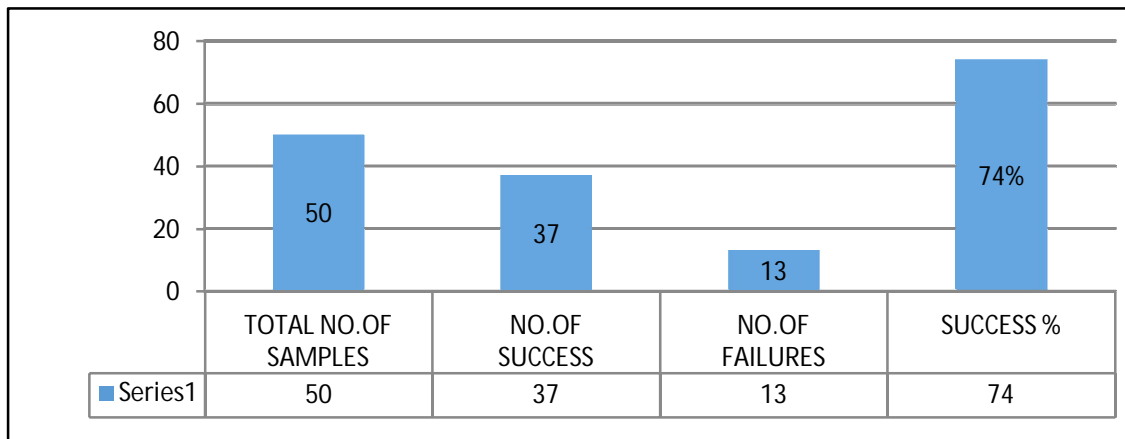


Figure 6: RSI SUCCESS RATE

It is observed that the relative strength index is carried a high number of successes (37) and a medieval number of failures (13) among total 50 sample as shown in above figure. At last it has given an above average success rate (i.e., 74%).

7.3. Comparison between Candlesticks with RSI Index

Total No. of Samples	Success Rate (%)	
	Doji	RSI
50	78	74

Table 9: Doji Vs. RSI (Success Rate)

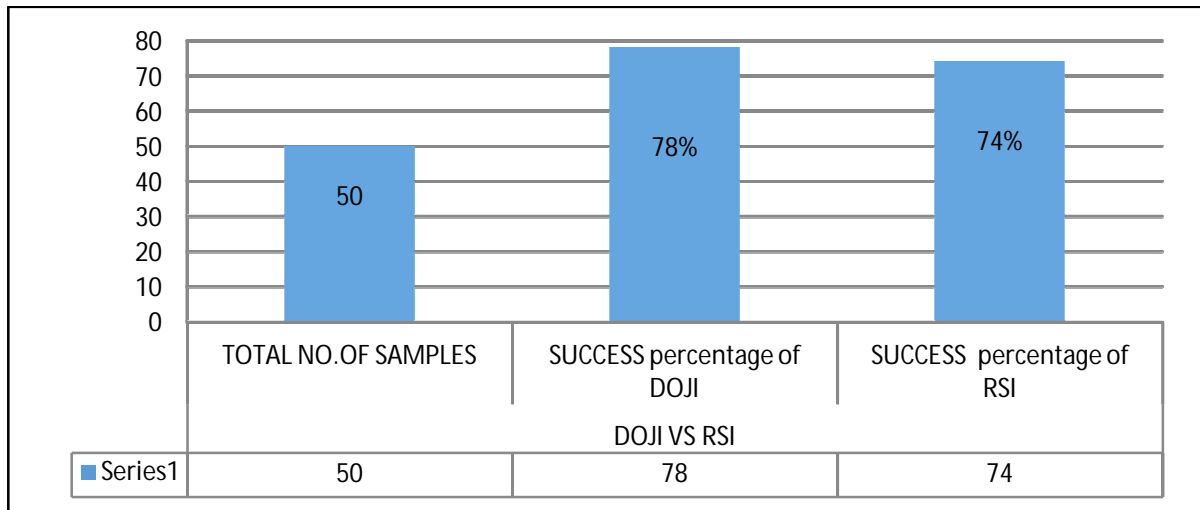


Figure 7: DOJI Vs RSI

It is observed that the relative strength index is carried a low number of success rate as 74% and doji candlestick is of 78% among total 50 sample as shown in above figure. At last it has given an above average success rate is deviated by RSI (i.e., 4%).

Total No. of Samples	Success Rate (%)	
	Hammer	RSI
50	80	74

Table 10: Hammer vs. RSI (Success Rate)

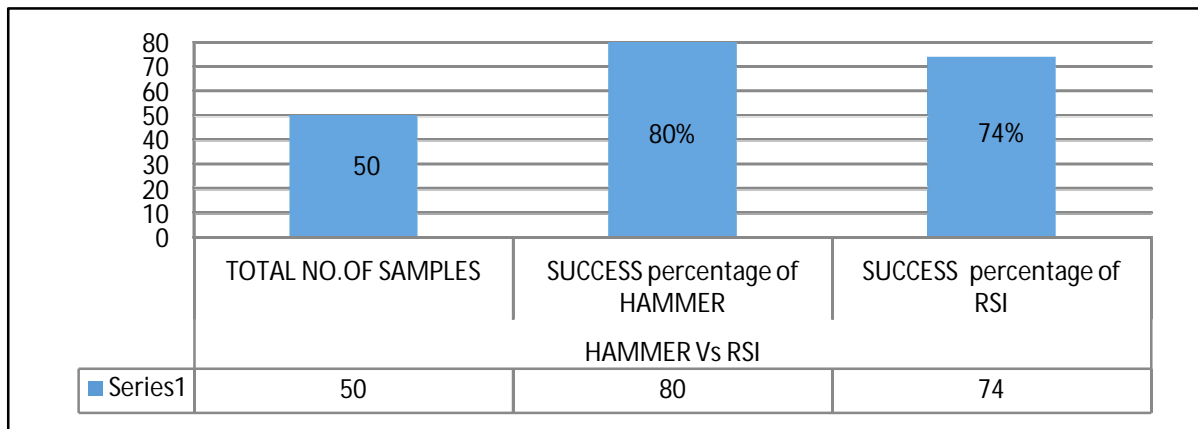


Figure 8: HAMMER Vs RSI

It is observed that the relative strength index is carried a low number of success rate as 74% and hammer candlestick is of 80% among total 50 sample as shown in above figure. At last it has given an above average success rate is deviated by RSI (i.e., 6%).

Total No. of Samples	Success Rate (%)	
	Inverse Hammer	RSI
50	70	74

Table 11: Inverse Hammer vs. RSI (Success Rate)

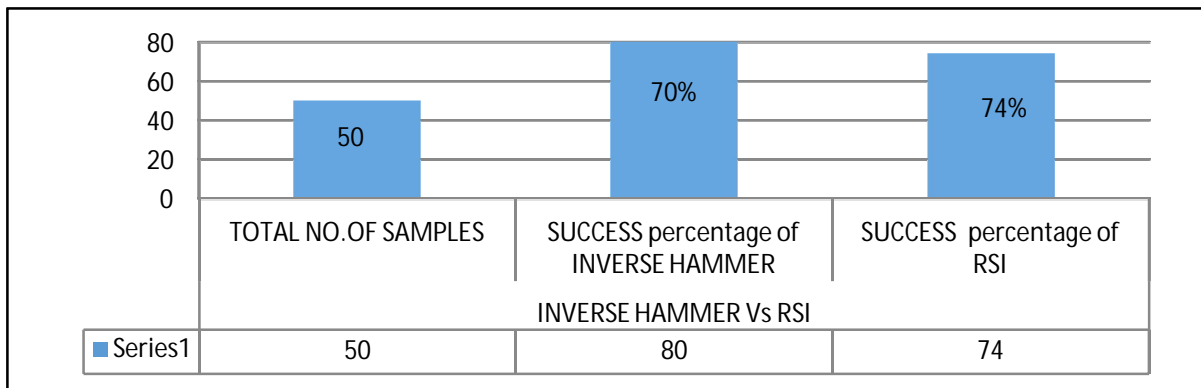


Figure 9: INVERSE HAMMER Vs RSI

It is observed that the relative strength index is carried a low number of success rate as 74% and inverse hammer candlestick is of 70% among total 50 sample as shown in above figure. At last, it has given an above average success rate is deviated by inverse hammer candlestick (i.e., 4%).

**8. Recommendations**

- i. We suggest to the trader to use either candlestick or RSI for his intraday trading based on his risk taking capabilities.
- ii. The trader with lesser risk taking capabilities to use candlesticks for his intraday trading so it’s a right chance to invest.
- iii. The trader who is expecting higher returns to use RSI for his intraday trading
- iv. We also suggest the trader who is using RSI to maintain proper balance in his account for making hedging to cover happen risk factor.
- v. Since the success rates of RSI is a little bit lower than candle sticks, therefore, its suggestible to invest to make utility of candlestick technique

**9. Conclusions**

The candlesticks and relative strength index techniques for trading crude oil in global commodity market success rates, give a result bullish towards investors especially to invest in commodities like crude oil.

RSI is a versatile momentum oscillator that has stood the test of time. Despite changes in volatility and the markets over the years, RSI remains as relevant now as it was in Wilder's days. Wilder considers overbought conditions ripe for a reversal, but overbought can also be a sign of strength. Bearish divergences still produce some good sell signals, but chartists must be careful in strong trends when bearish divergences are actually normal. Even though the concept of positive and negative reversals may seem to undermine Wilder's interpretation, the logic makes sense and Wilder would hardly dismiss the value of putting more emphasis on price action. Positive

and negative reversals put the price action of the underlying security first and the indicator, second, which is the way it should be. Bearish and bullish divergences place the indicator first and price action second. By putting more emphasis on price action, the concept of positive and negative reversals challenges our thinking towards momentum oscillators.

#### 10. Limitations

- i. Based on intra-day trading from the first quarter of 2015 results drawn, it may not affect on real time performance of the commodities.
- ii. The estimated results that are drawn are subject to uncertainty. Hence, it does not give any guarantee for future profits.
- iii. Only few Commodities were studied through Candlestick and RSI.

#### 11. Scope for Further Research

With globalization and innovation in the commodity markets at its peak - it is very essential to study the market risks and requirements. Over the years, the India commodity market has undergone major changes to remain at par with the global peers. With global trade getting more dynamic day by day, the India commodity market is not far behind to experience these developments. Commodities markets, both historically and in modern times, have had a tremendous economic impact on nations and people. The impact of commodity markets throughout history is still not fully known

#### 12. References

- i. Antonios Antoniou and Andrew J Foster (June 1992) The effect of futures trading on spot price volatility: evidence for Brent crude oil using GARCH, *Journal of Business Finance and Accounting* 19(4) 473–484
- ii. Moosa, I.A. and Loughani, N.E., 1994. Unbiased and time varying risk premia in the crude oil futures market, *Energy Economics*, 16, 99–105
- iii. Agricultural Commodities, *Journal of Agricultural Economics*, Vol. 48, No. 3, 1997, pp. 408-423.
- iv. Peroni, E., McNown, R.F., 1998. Non informative and informative tests of efficiency in three Energy futures markets. *Journal of Futures Markets* 18, 936–964.
- v. Mckenzie, A. M. and M.T. Holt, “Market Efficiency in Agricultural Futures Markets”, Selected Paper presented at American Agricultural Economics Association Annual Meeting, Salt LakeCity. 2002
- vi. Domanski & Heath (2007), “Financial investors and commodity markets”, *BIS Quarterly Review*, March 2007, pp 53-67
- vii. Covel, Michael W., 2005, *Trend Following: How Great Traders Make Millions in Up or Down Markets* (Prentice-Hall, New York, NY).
- viii. Kaur and Rao (2010), “An Empirical study of select Agricultural Derivatives Traded on NCDEX”, *Journal of Management Research*, Vol. 10, No. 2, August 2010, pp 116-132
- ix. Kumar, Vashisht and Kalita, “Food Inflation: Contingent and Structural Factors”, *Economic & Political Weekly*, Vol - XLV No. 10, March 6, 2010
- x. Murthy and Reddy, “Commodity Futures Market: A Necessity for the Indian Farmers”, *Research Journal of Social Science and Management*, Volume: 02, Number: 02, June-2012, pp 100-109
- xi. Kristoufek L, Vosvrda M (2012), “Commodity futures and market efficiency”, *International Journal of Advancements in Research & Technology*, Volume 1, Issue 5, October-2012
- xii. Soni and Singla (2012), “A Study of the Efficiency and Unbiasedness in NCDEX: A Case Study of Guar Gum”, XI Capital Markets Conference, 21-22 December 2012, Indian Institute of Capital Markets (UTIICM) Sorensen C, “Seasonality in Agricultural Commodity Futures”, e paper.
- xiii. <http://www.investing.com/commodities/crude-oil-candlestick>
- xiv. <http://www.tradingportalen.com/>
- xv. <http://www.rb-trading.com/article9.html>
- xvi. <http://www.candlecharts.com/candlestick-charting-glossary.htm>
- xvii. <http://www.mcxindia.com/>
- xviii. <http://www.mt4.com/>
- xix. <http://www.mt5.com/>