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ANALYSING THE IMPACT OF COVID-19 ON THE EFFECTIVENESS OF CANDLESTICK PATTERNS IN THE NIFTY FMCG INDEX

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Abstract

This study investigates the effectiveness of selected candlestick patterns (Hammer, Inverted Hammer, Engulfing, Harami, and Morning Star) in predicting market trends before and after the COVID-19 pandemic. Using daily stock data from the Nifty FMCG index, the research compares the frequency and success rates of these patterns across two periods: pre-COVID-19 (April 2016 to March 2020) and post-COVID-19 (April 2020 to March 2024). The findings reveal notable shifts in pattern occurrences and a slight decline in success rates post-COVID-19, with the Harami pattern remaining the most reliable. This analysis provides insights into market behaviour changes and guides investors in optimizing trading strategies in the post-pandemic environment.

Keywords: candlestick chart, Pattern, NSE, Nifty FMCG, COVID-19.

Introduction

There are two major thoughts in financial market, one is Fundamental analysis that is based on about the economical-financial fundamental of organization, involving their business structures, balances, financial health, among other criteria. Other one is based on technical analysis, also known as graphical analysis is based on past data and trend of the market [1]. Candlestick charting techniques were introduced to the Western world by Steve Nison in the 1970s, originating from Japan. The two types of indicators used by technical analysis practitioners are mathematical and visual patterns, like candlesticks. Since visual patterns are thought to provide light on market behaviour, the majority of empirical study has concentrated on patterns [2]. We have to acknowledge the past stock and market data provides necessary indications about how the market will perform going forward. This premise provides the basis for technical analysis, which essentially looks at a securities historical performance to assess investments at the present times [3]. The techniques of using candlestick like plotting of price data was developed and practiced by Munehisa Homma (1724 -1803) a rice trader in Dojima Rice exchange, Japan. Candlestick technical analysis can be useful trading tool provided proper stop-loss strategy is adopted. In the securities market, if the prices are primary element, then the trading volume were the secondary element. Besides serving as a vital source of support for managing market price fluctuations, trading volume indicates the stock's liquidity based on daily share transactions. Thus, it was easy to determine the factual commitment of price movement when stock prices and trading volume were combined [4,5].

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Literature review

Technical analysis is the art and science of predicting future prices by analysing historical price movements. Technical analysis is not an astrological for price prediction. Examining the present supply and demand of tradable instruments such as stocks, futures, indexes, commodities, or futures is the basis of technical analysis [6]. A vital tool in technical analysis is the candlestick chart. With the use of this technique, investor emotions—such as fear and greed—are translated into identifiable trends on charts. Traders can access it because it is extensively utilized in many software programs, such as Microsoft Excel [7]. A candlestick shows the opening, closing, high, and low prices over a given period of time. The "body" refers to the difference in price between the opening and closing price. If the close price is higher than the open price, the body is green or white, which indicates rising price. If the open price is higher than the close price, the body is red or black, which indicated falling price [8]. Candlestick technical analysis is distinct in that it is relatively short term and produces buy and sell signals based on the relationship between open, high, low, and close prices within a day and over the following days, Selected scrips are hold for maximum of 10 days [9]. The profitability of ten reversal candlestick patterns in the Chinese stock market can be analysed in a nuanced manner by analysing stocks based on size, liquidity, and price-to-earnings (PE) ratio, The methodology entails the classification of corporations into groups based on their size (outstanding shares). This process is replicated annually, enabling a thorough examination of the characteristics of the stock over time. [10]. The emerging discipline of behavioural finance, which investigates the ways in which psychological factors influence market behaviour. This viewpoint implies that the efficacy of technical trading strategies may be compromised by the irrational behaviour of market participants, examining the fundamental, technical, time, and correlation factors that influence price fluctuations. His research encompassed an analysis of candlestick patterns, with a particular emphasis on the pin bar and bearish-bullish engulfing patterns, over extended periods of time [11]. The profitability of candlestick technical analysis, which generates trading signals by utilizing short-term historical data (one to three days). The patterns that are established by the relationships between open, high, low, and close prices are essential to this analysis, as certain patterns suggest the continuance or reversal of trends [12].

Candlestick charting

candlestick chart is a one tool for examining various eras, which can be used to illustrate the correlation between trade price and time and represents the magnitude and kinds of trading volatility. A candlestick chart has upper and lower shadows in addition to the candle body on each line. One day has been chosen as the trading time unit. The candle body on the chart is constructed using the difference between the opening and closing prices. If the opening price is less than the closing price, indicating a bull market tendency, the entity is considered white/green. In contrast, the colour black/red indicates a bear market. By observing alterations in the body colour and shadow length on the chart, an investor may identify the sentiment of the day. For average investors, though, this is an extremely challenging process.

Figure 1: Candlestick pattern

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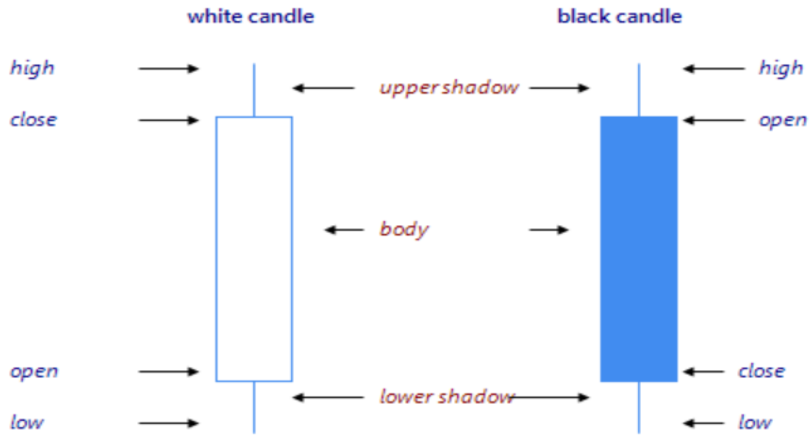


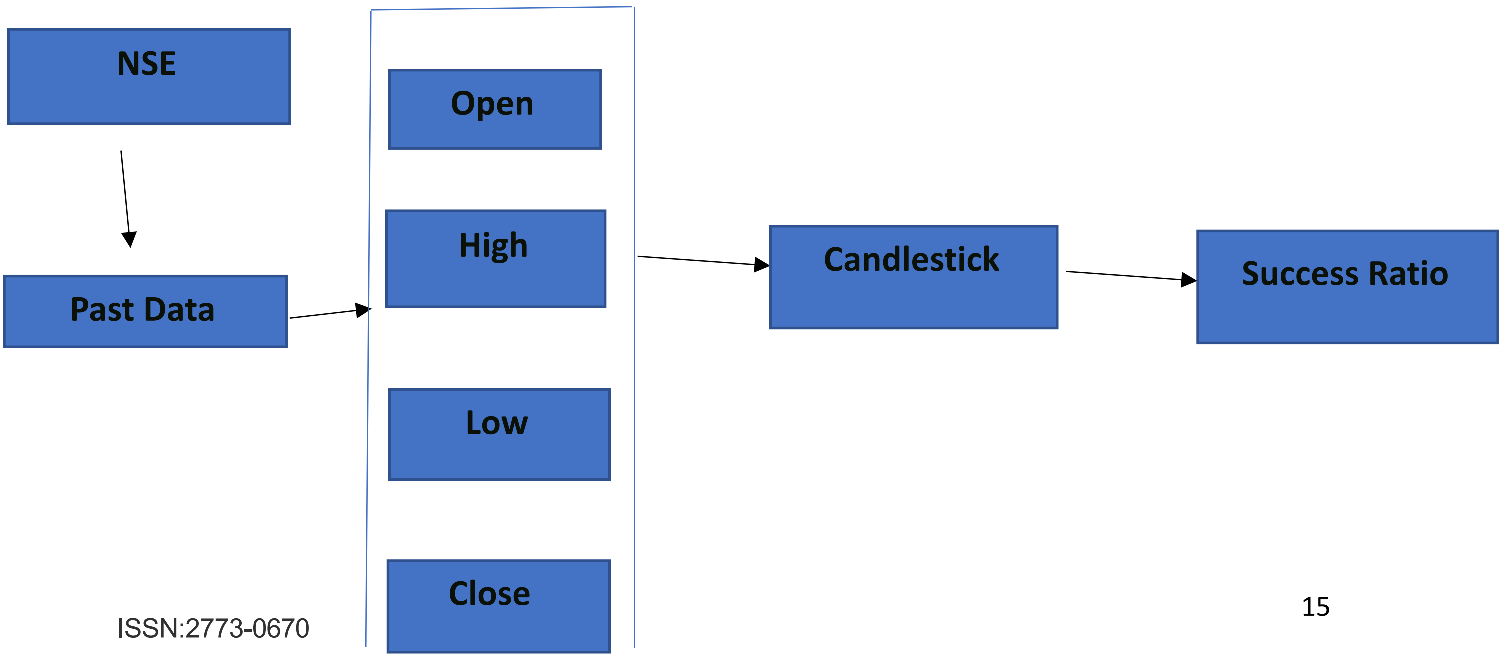
Source: Complied by author

Consequently, investors can look up past charts that resemble the current chart in order to make stock predictions using candlestick charts. After that, the chart that is the most comparable to it is found, and the past stock movement linked to it is said to be predictive of the future direction in the stock market [13].

Research Objective:

The main aim of the study is to explore the effectiveness of selected candlestick pattern formation in the expected market trend. And compare the selected one day, two day and three-day candlestick patterns individual performance and success ratio by comparison of before and after the event of COVID-19 in selected Nifty index of FMCG, provide a visual information to enhance rationale investment decision making for investors.

Figure 2: Technical Analysis



Isaac Kofi Nti, Adebayo Felix et al., 2019

Data and Methodology

This study utilizes a vast data set of NIFTY FMCG index constituents leading benchmark index of FMGC. The stock price data used is daily Open, High, Low, Close. Every stock has approximately 2400 data points. Data were collected from secondary source of trading of equity market in NSE. The population under investigation for this study is the companies which are actively traded in Nifty FMCG Sector. This study enfolds a period of eight years as comparison from April 2016 to March 2020 considered as before COVID-19 and April 2020 to March 2024 as after COVID-19.

Table 1: NIFTY FMCG

ISIN Code	Symbol	Company Name	Date of Listing
INE119A01028	BALRAMCHIN	Balrampur Chini Mills Ltd.	08-02-1995
INE216A01030	BRITANNIA	Britannia Industries Ltd.	05-11-1998
INE259A01022	COLPAL	Colgate Palmolive (India) Ltd.	17-12-2007
INE016A01026	DABUR	Dabur India Ltd.	28-04-1999
INE102D01028	GODREJCP	Godrej Consumer Products Ltd.	20-06-2001
INE030A01027	HINDUNILVR	Hindustan Unilever Ltd.	06-07-1995
INE154A01025	ITC	ITC Ltd.	23-08-1995
INE196A01026	MARICO	Marico Ltd.	01-05-1996
INE239A01024	NESTLEIND	Nestle India Ltd.	01-08-2023
INE179A01014	PGHH	Procter & Gamble Hygiene & Health Care Ltd.	07-07-2004
INE944F01028	RADICO	Radico Khaitan Ltd	18-06-2003
INE192A01025	TATACONSUM	Tata Consumer Products Ltd.	18-11-1998
INE686F01025	UBL	United Breweries Ltd.	28-07-2008
INE854D01024	UNITDSPR	United Spirits Ltd.	27-09-2001
INE200M01021	VBL	Varun Beverages Ltd.	08-11-2016

Source: Complied by author

Bullish Pattern

S. No	Pattern	Candles Formation	Pattern Type
1	Hammer	1	Bullish Reversal
2	Inverted Hammer	2	Bullish Continuation
3	Engulfing	2	Bullish Reversal
4	Harami	2	Bullish Reversal
5	Morning Star	3	Bullish Reversal

Hammer:

Hammer is a single candlestick pattern which takes place at the end of the downtrend & indicated bullish reversal. The body of candle positioned at top with lower shadow which should be twice than the body size. This candle has small or no upper shadow.

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Inverted Hammer:

Inverted hammer candle is a two-day candle. The first candle has a black/red body and is observable as a long line. The second candle can have a spinning top that is either black or white and can appear as a short or lengthy line. Either the shadow is shorter than the body or it does not exist at all. A minimum of 2.5 times the length of the body is required for the top shadow. The pattern indicates a reversal when it emerges in a downward trend. It must be validated by breaking through the closest trendline or resistance zone.

Bullish Engulfing:

The Bullish Engulfing pattern consists of two lines, where the body of the black/red candle in the first line is swallowed up by the body of the white/green candle in the second line. When the pattern is in a downward trend, it indicates when it will reverse. When trading volume data for a particular market is obtainable and it increases on the second line, there is an increased level of pattern dependability. On the ensuing candles, the Bullish Engulfing pattern must be confirmed.

Harami:

The Bullish Harami pattern consists of two lines, where the body of the black candle in the first line engulfs the body of the white candle in the second line. The pattern predicts a downtrend's reversal when it emerges. The next candles have to confirm the Bullish Harami pattern. A downtrend is expected to persist if a candle that appears to be following the pattern falls below the second line's opening price. On the other hand, there's a probability that the downtrend will be stopped if a candle that is following the pattern closes above its second line.

Morning star:

Morning star is a bullish reversal pattern and opposite of evening star, this trend prior to the downtrend pattern. First candle is in a downtrend and has a black/red candle. Second candle should be white/black body candle, the candle body placed below the prior body. Third candle have a white/green candle, it is located above the prior body and the candle closes at least halfway up the body of the initial line. By breaching the trendline or the closest resistance zone, which may be generated by the pattern's first line, the Morning Star should be verified on the candles that follow. The pattern's third line can turn into a support zone if it is validated. If the pattern is not validated, there might be only a brief respite before to additional market falls.

Analysis and Findings

Table 2: Before COVID-19

Symbols	Hammer	Inverted Hammer	Engulfing	Harami	Morning Star
BALRAMCHIN	5	88	36	63	2
BRITANNIA	11	75	35	62	1
COLPAL	10	79	32	63	1
DABUR	5	61	42	74	2

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GODREJCP	8	65	29	69	2
HINDUNILVR	8	69	43	50	2
ITC	10	76	26	83	3
MARICO	7	70	37	69	1
NESTLEIND	11	70	39	64	1
PGHH	24	75	48	51	1
RADICO	6	99	36	65	1
TATACONSUM	3	100	43	60	1
UBL	2	86	35	72	1
UNITDSPR	3	82	37	60	1
VBL	11	92	39	58	3

Observations:

- **PGHH** has the highest occurrence of the Hammer pattern (24 times), suggesting that this pattern might have appeared frequently for this stock before COVID-19.
- **TATACONSUM** has the highest occurrence of the Inverted Hammer pattern (100 times), which is significantly higher than other stocks.
- **PGHH** has the highest occurrence of Engulfing pattern (48 times), the occurrence is relatively higher than other scrips.
- **DABUR** has a relatively high occurrence of the Harami pattern (74 times), indicating a more frequent appearance compared to other stocks.
- **ITC** shows the highest count for the Morning Star pattern (3 times), which is relatively rare among the stocks listed.

Table 3: Pattern Formation After COVID-19

Symbols	**Hammer**	**Inverted Hammer**	**Engulfing**	**Harami**	**Morning Star**
BALRAMCHIN	5	83	20	69	1
BRITANNIA	8	86	39	68	1
COLPAL	5	70	39	76	0
DABUR	7	58	49	66	0
GODREJCP	6	69	42	59	1
HINDUNILVR	14	64	38	61	2
ITC	8	67	36	64	1
MARICO	8	46	50	81	0
NESTLEIND	13	72	41	70	2
PGHH	21	70	43	72	1
RADICO	6	97	34	58	4
TATACONSUM	7	67	34	81	0
UBL	3	89	48	59	0
UNITDSPR	3	73	41	68	0
VBL	12	71	29	68	1

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Observation (After COVID-19)

Hammer Pattern:

- The highest occurrence is for **PGHH** (21 times), followed by **HINDUNILVR** (14 times) and **NESTLEIND** (13 times).
- The overall occurrences of the Hammer pattern are generally lower compared to the pre-COVID-19 data.

Inverted Hammer Pattern:

- **RADICO** again shows a high occurrence (97 times), similar to the pre-COVID-19 data.
- Other stocks like **BRITANNIA** (86 times) and UBL (89 times) also show relatively high occurrences.

Engulfing Pattern:

- **MARICO** shows the highest occurrence (50 times), a significant increase compared to pre-COVID-19 levels.
- Other stocks like **DABUR** (49 times) and **UBL** (48 times) also show increased occurrences.

Harami Pattern:

- **MARICO** and **TATACONSUM** show the highest occurrences (81 times each), which is higher than pre-COVID-19 levels for both stocks.
- PGHH also shows a significant increase in Harami patterns (72 times).

Morning Star Pattern:

- The Morning Star pattern remains relatively rare, with **RADICO** having the highest occurrence (4 times).
- Some stocks like **COLPAL** and **MARICO** have no occurrences of the Morning Star pattern.

Key Comparisons:

- Hammer Pattern: The frequency of the Hammer pattern seems to have decreased for several stocks post-COVID-19 (e.g., **COLPAL** dropped from 10 to 5 occurrences).
- Inverted Hammer Pattern: The pattern remains consistently high for **RADICO**, while some stocks like **BRITANNIA** and **UBL** have seen an increase in occurrences.
- Engulfing Pattern: There's an increase in the occurrences of the Engulfing pattern post-COVID-19, particularly for **MARICO** and **DABUR**.
- Harami Pattern: A notable increase in occurrences, especially for **MARICO** and **TATACONSUM**.
- Morning Star Pattern: It remains rare overall, with some increases for specific stocks like **RADICO** [14].

Table 4: Success rate Before COVID-19

S.NO	**Pattern**	**No. of Occurrences**	**Success**	**Failure**	**Success Rate (%)**
1	**Hammer**	124	82	42	66.12903226

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2	**Inverted Hammer**	1187	849	338	71.52485257
3	**Engulfing**	557	372	185	66.78635548
4	**Harami**	963	704	259	73.10488058
5	**Morning Star**	23	16	7	69.56521739

- The Hammer pattern had a moderate success rate of about 66%, indicating it was reliable more than half the time in predicting market movement or reversals before COVID-19.
- One of the most dependable patterns was the Inverted Hammer pattern, which was rather common and had a strong success rate of over 71%.
- Nearly two thirds of the time, the Engulfing pattern was advantageous for traders because to its moderate success rate, which was similar to that of the Hammer pattern.
- The Harami pattern was quite reliable with a success rate of over 73%, making it one of the most effective patterns before the pandemic.
- Even though there were only 23 occurrences of the Morning Star pattern, its success rate of almost 70% showed that it was effective when it did occur.

Table 5: Success Rate After COVID-19

S.NO	Pattern	No. of Occurrences	Success	Failure	Success Rate (%)
1	**Hammer**	126	83	43	65.87301587
2	**Inverted Hammer**	1082	738	344	68.20702403
3	**Engulfing**	583	376	207	64.49399657
4	**Harami**	1020	746	274	73.1372549
5	**Morning Star**	14	9	5	64.28571429

- ❖ COVID-19, the Hammer pattern's success rate only slightly decreased, showing steady performance. The pattern's occurrence rate also remained very stable.
- ❖ The Inverted Hammer pattern saw a decrease in both occurrences and success rate. The drop-in success rate by about 3.3% suggests that this pattern became less reliable after COVID-19.
- ❖ After COVID-19, the Engulfing pattern became significantly more frequent, but its success rate decreased by nearly 2.3%, suggesting a minor decline in reliability.
- ❖ The Harami pattern saw an increase in both occurrences and success rate, maintaining its status as the most reliable pattern with a stable success rate.
- ❖ The Morning Star pattern lost almost 5% of its success rate and started to become less common. This implies that after COVID-19, the pattern became less consistent.

Discussion

Before and after COVID-19, the Harami pattern was the most dependable and steady, with a success rate that stayed over 73%. After COVID-19, the success rates of the Inverted Hammer,

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Engulfing, and Morning Star patterns all decreased, suggesting a decrease in their dependability. Specifically, the Inverted Hammer design showed a discernible decrease in both success rate and frequency. The Morning Star pattern became less frequent, whereas the other patterns saw only slight changes in frequency of occurrence.

Limitation and Scope for the Future study

The current study focuses solely on candlestick chart pattern and restricted to NIFTY FMCG index for examining the performance and success percentage by comparing before and after the event of COVID-19, this research suggested that future research may concentrate on various index market to evaluate the performance of candlestick reversal pattern.

Conclusion

The data indicates that the frequency of certain candlestick patterns in NIFTY FMCG has changed post-COVID-19, which could be reflective of changes in market behaviour or stock volatility. A possible change in market sentiments or price action behavioural patterns during and after the epidemic is suggested, for example, by the notable increase in the Harami pattern observed across a number of stocks. This could provide insights for traders analysing these patterns in the context of post-COVID-19 market conditions. The majority of candlestick patterns have experienced a minor decline in efficiency after the COVID-19 pandemic; however, the Harami pattern has remained dependable. The performance of these patterns in actuality may be impacted by greater shifts in market dynamics and conditions during and after the pandemic. After the pandemic, traders may need to modify their approach and depend more on the Harami pattern or reevaluate their use of other patterns.

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