

Sectoral Study Based on Abnormal returns For Metal & Pharma Sector Post Covid

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by

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DATE: APRIL 2023

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation entitled, “Sectoral Study Based on Abnormal Returns for Metal & Pharma Sector Post Covid” is based on the results of investigations carried out by me in the MBA(FS) at the Business School, Goa University under the Supervision/Mentorship of Dr. Pournima Dhume and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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COMPLETION CERTIFICATE

This is to certify that the dissertation report “Sectoral Study Based on Abnormal Returns for Metal & Pharma Sector Post Covid” is a bonafide work carried out by Ms. Trisha Rhea Gracias under my supervision in partial fulfilment of the requirements for the award of the degree of **Master’s in Business Administration (Financial Services)** in the Discipline MBA at the Goa Business School, Goa University.

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Sectoral Study Based on Abnormal returns For Metal & Pharma Sector Post Covid

Introduction

Various studies have been conducted over the years to understand the relationship between macroeconomic factors and the Indian stock market (Singh & Padmakumari, 2020). Out of the many macroeconomic parameters, inflation is one of the most important variables that can impact the Indian stock market (Singh & Balasubramanian, 2022). In India, inflation is measured using the CPI (Consumer Price Index) and the WPI (Wholesale Price Index). For an investor or trader, it is important to take a sound decision when they expect to generate returns from the stock market (Singh & Padmakumari, 2020). This paper aims to study the daily opening and closing of stock prices after the Covid period i.e., 2021-2022 to understand how stock prices get affected as the inflation rate changes by using inflation announcements which can impact the opening and closing prices of stock across various sectors. It is an extension of previous research work by Singh & Balasubramanian, 2022 where they analyzed 5 sectoral indices: the NIFTY BANK, NIFTY REALTY, NIFTY SERV SECTOR, NIFTY ENR, AND NIFTY FMCG. The sectors focused on for this study are NIFTY MET, AND NIPFARM using NIFTY 500 as our base index. For developed countries, empirical studies with theoretical predictions have been significantly true for inflation for a period of time. However, for developing countries like India, the consensus does not match the empirical findings (Paul et al., 2017).

Literature Review

A large number of empirical studies have been carried out to comprehend stock market returns having inflation as its prime variable. Studies carried out by research analysts Schwert and Fama, (Fama & Schwert, 1977) and Schwert show a negative relationship of inflation and stock prices (Schwert, 1981). As per the "Flow Through Hypothesis" businesses have the ability to pass the inflation shock to the goods and services as it plays a crucial role in terms of inflation returns (MacArthur, 1982) (Cano et al., 2016). Another empirical literature suggests that stock price sensitivity depends upon monetary policies and fluctuations in price level (Durham, 2013). Analyst (Díaz & Jareño, 2009) used event study methodology to monitor the stock price reaction to the short term inflation announcement but no clear evidences were noted for the unanticipated announcement. On investigating the link between inflation and returns obtained from a portfolio the study suggested that PPI (Producers Price Index) has a stronger impact than CPI (Consumer Price Index) (Adams et al., 2004). The impact of inflation on stock returns depends upon the state of the economy and investors perception whether to consider the inflation news as a bad or good sign depending upon the health of the economy (Díaz & Jareño, 2009). Studies conducted at the time of pre and post period reform in India on stock returns having inflation as its variable there seems to be no significant impact of inflation on real stock returns when calculated as per the MODWT Test (Bhanja & Billah, 2019). Studies carried out on the Indian stock market returns based on the GDP, inflation rate and interest rate done by using regression model suggests that there is a 95.6% direct impact on the stock market returns (Mohan & N. Chitradevi, 2011). Research carried out by analysts Kushal Banik Chowdhury, Kaustav Kanti Sarkar, Srikanta Kundu during the inflation switching regime suggests that inflation boosts up during output growth but after the switch regime the nominal uncertainties have stabilized the prices under the monetary authority (Chowdhury et al., 2021). Study conducted by Basabi Bhattacharya and Jaydeep Mukherjee on the causality relationship of Sensex BSE and macroeconomic aggregates such that there exists no casual linkage and the stock prices do carry the information of the past which influences the prices of stocks (Bhattacharya & Mukherjee, 2002). From the above we can conclude that there are various studies and theories which explain the relationship between stock market and inflation and each literature holds a mixed conclusion whether the relationship is significant or not. The findings from this study will provide us insights on how the Indian stock market after the covid pandemic reacts to the short-term announcement to the inflation news. Since studies based on this were already carried out in a research paper that focused on a period from July 2011 to December 2018 by focusing on five sector

indices i.e., Services, Banking, Realty, FMCG and Energy(Singh & Balasubramanian, 2022). This study adds to the previous literature work as we focus on inflation announcements post covid focussing on Metal and Pharma Sector indices having Nifty 500 as its base.

Data & Methodology

This research study aims to find abnormal returns for Nifty metal index and Nifty Pharma index for a short period i.e., five days both before and after the inflation announcement. The time period chosen for this study is Post Covid 2021-2022. The methodology used here is the event study methodology defined by MacKinlay (Mackinlay, 1997). The purpose of an event study is to examine how the market responds to the advent of an inflation statement by looking at abnormal returns on the day of the event. Event methodology evaluates market efficiency. By market efficiency, we imply that there shouldn't be any abnormal returns and that stock prices should accurately reflect all information, both publicly and privately available. According to the efficient market concept, stock prices will only react to the surprise element of the inflation news. The data collected for this study is from a secondary source – investing.com.

The initial steps which are needed to perform before event study methodology are, we need to find the release dates of inflation both for CPI and WPI (actual and forecast) which are obtained from investing.com, based on this difference we get to know whether the inflation rate was overestimated or underestimated on obtaining the difference between the actual and the forecast. The second step is to obtain the opening and closing prices of our sector indices Nifty Metal and Nifty Pharma and our base index Nifty 500. The number of events recorded for this one-year period were a total of 24 for both CPI and WPI and 2 events for each were selected respectively. Event selection were done on the basis of an estimation error which ranged from 0.19-0.35. The events selected for the study are listed below:

Release Date/Event Date	Actual	Forecast	Difference	Overestimation/Underestimation	Source
13-09-2021	5.30%	5.60%	-0.30%	overestimation	CPI
12-03-2021	5.03%	4.83%	0.20%	underestimation	CPI
14-07-2022	15.18%	15.50%	-0.32%	overestimation	WPI
14-02-2022	12.96%	12.70%	0.26%	underestimation	WPI

For event study methodology, we have two periods the observation period and the estimation period. For the observation period we consider $t=0$ the event day and $t-5$ and $t+5$ as five days before and after the event day respectively. For the estimation period we take $t-10$ which is 2 months before our event day. Returns during this estimation period is compared to the returns for the observation period under all three conditions for event day, before and after. If abnormal returns are observed on the event day it means that the sector is affected by the news of the inflation announcement to some extent and if abnormal returns are observed before the announcement day it means that some insider information was reflecting the sector returns and if the returns are abnormal after the event day it could mean that the returns till hold an impact to the inflation announcement and our Indian markets are not efficient to such news.

Estimation Period		Observation Period		
		Before	Event Day	After
-100	-10	-5	0	5

The steps involved to carry out event study:

- i. Calculate daily returns for both sector index and market index

$$R_{i,t} = \ln(P_{i,t}/P_{i,t-1}) \dots\dots\dots 1$$

$$R_{m,t} = \ln(P_{m,t}/P_{m,t-1}) \dots\dots\dots 2$$

Where,

t = Refers to time

$R_{i,t}$ = Return on day t of security i

$P_{i,t}$ = Price on day t of security i

$P_{i,t-1}$ = Price on day t-1 of security i

$R_{m,t}$ = Return on day t of market index m

$P_{m,t}$ = Price on day t of market index m

$P_{m,t-1}$ = Price on day t-1 of market index m

- ii. To calculate Predictive Returns

$$P(R)_{i,t} = \alpha + \beta * R_{m,t} \dots\dots\dots 3$$

Where,

$P(R)_{i,t}$ = Predictive return for the security i at time t

Alpha is the risk-free rate and

Beta measures sensitivity of a security w.r.t market

- iii. To check the effectiveness of the Indian stock market we need to calculate the abnormal returns around the event day. Abnormal returns are calculated as per the OLS model given by Brown and Warner (Brown & Warner, 1985)

$$AR_{i,t} = R_{i,t} + P(R)_{i,t} \dots\dots\dots 4$$

Where,

$AR_{i,t}$ = Abnormal return of security i, at time t

- iv. Finally we calculate tstat to check whether AR is significant or not.

$$Tstat = AR_{i,t} / \text{Standard error} \dots\dots\dots 5$$

T stat is a measure to check the significance during the observation period based on the inflation announcement.

The null hypothesis H_0 = there is no significant abnormal returns during the observation period caused by inflation announcement.

Findings & Discussion

Opening Prices and Closing Prices

For the metal sector, there are no statistically significant events on the release day for both closing and opening prices under both the condition i.e., overestimation and underestimation at 5% level of significance, but we do have few events which are significant abnormal returns five days after and before the inflation release date as per **Table 1**. The highest and the lowest abnormal returns (-5, +5) are 2.47% and -3.83% respectively for closing prices (**Figure 1**), and the highest and lowest abnormal returns (-5, +5) are 2.98% and -4.40% respectively for opening prices (**Figure 2**).

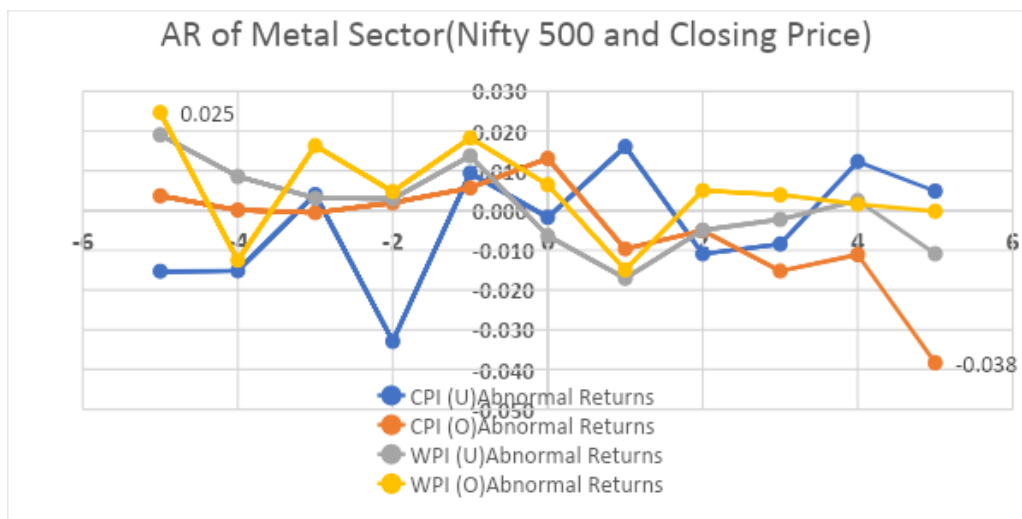


Figure 1: AR (Abnormal Returns) of Metal Sector-Nifty 500 and Closing Price

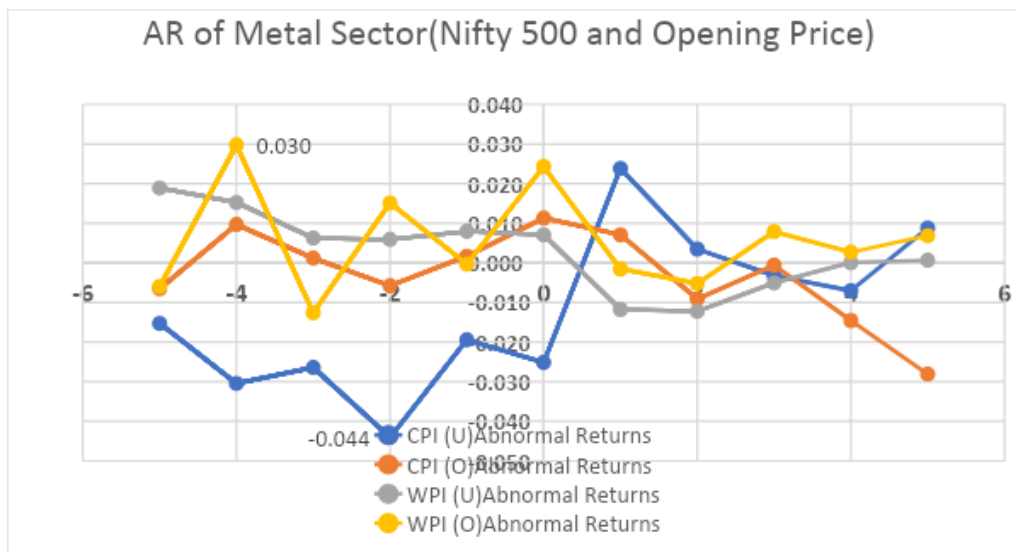


Figure 2: AR (Abnormal Returns) of Metal Sector-Nifty and Opening Price

For the pharma sector, there is a statistically significant event on the release day of the opening price at 5% level of significance, we also have a significant event one day before the release date as seen in **Table 1**. The highest and the lowest abnormal returns (-5, +5) are 1.75% and -12.03% for closing prices (**Figure 3**). The highest and the lowest abnormal returns (-5, +5) are 1.72% and -48.46% (**Figure 4**).

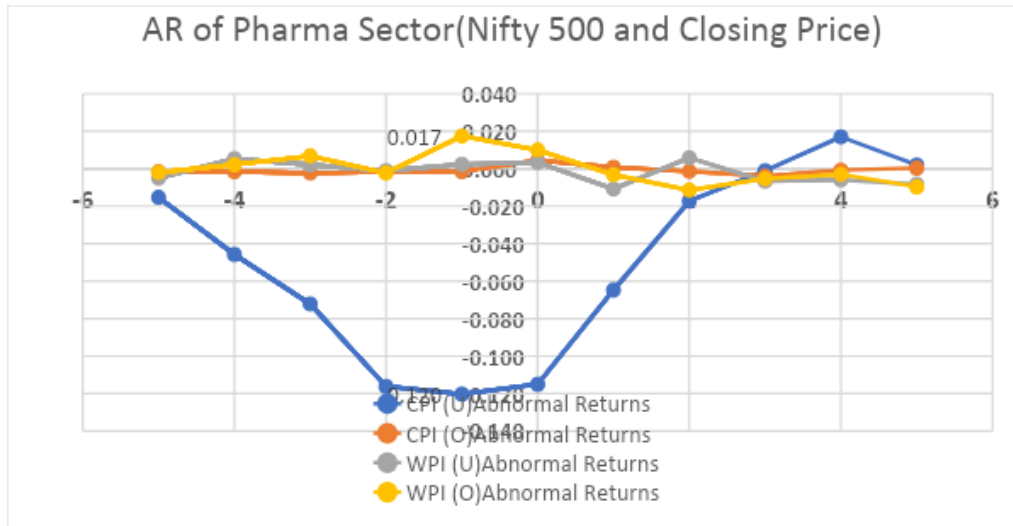


Figure 3: AR (Abnormal Returns) of Pharma Sector-Nifty 500 and Closing Price

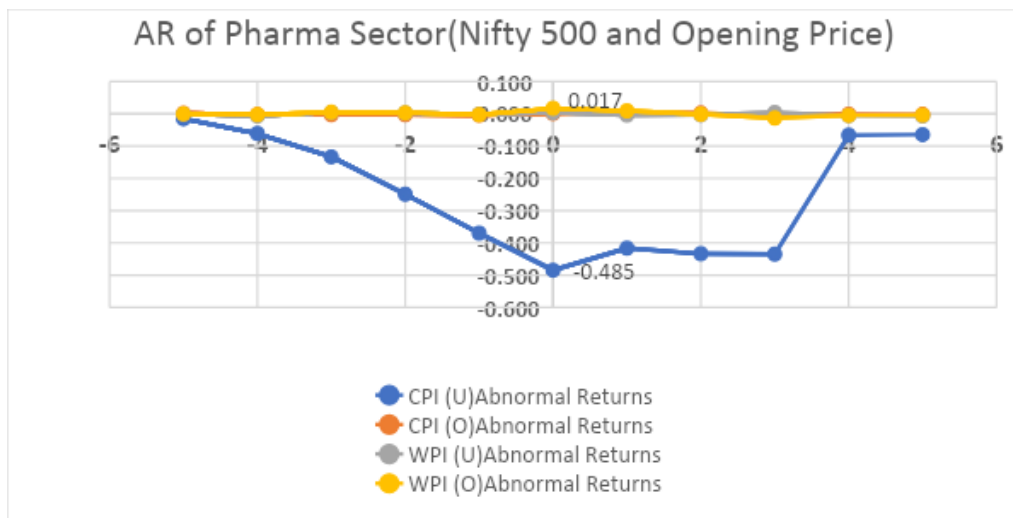


Figure 4: AR (Abnormal Returns) of Pharma Sector-Nifty 500 and Opening Price

Table 1: Abnormal Returns of Metal and Pharma Sector and its significant values

Discussions

As per our findings a part of abnormal returns on share prices could be the inflation news which is reflected on the share prices. From the market perspective Indian markets do carry the effect of such news as it is seen to be significant at 5% for few days before and after the inflation announcement. These abnormal returns vary to be positive or negative for CPI and WPI(Singh & Balasubramanian, 2022). Only under one condition the abnormal returns were significant on the event day which was for the opening prices of Pharma sector.

The reason for lower abnormal returns for both metal and pharma sector in comparison to the other sectors studied i.e., Banking sector, Service sector, Realty sector could be because of the weightage these stocks hold in Nifty 500 as they are comparatively lower and not as sensitive to the inflation announcement as for instance in the case of Banking sector. The results are not very clear and evident as we obtain mixed responses for both the sectors across the regimes. All in all, considering all four conditions of overestimation and underestimation for CPI and WPI the significance of abnormal returns for the observation period is very low and this indicates that the abnormality is spread across the sectors and its impact doesn't last for a very long time period.

Conclusion

The study aims to find abnormal returns for metal and pharma sector at 5% level of significance using Nifty 500 as a base. We conclude that the impact of inflation is distributed across the sectors and Nifty 500 is a huge index to study such an impact. The study focusses on returns after Covid for these two sectors and it could be narrowed down to Nifty 50 to get a clear picture whether the impact is the same or more evident. The study also concludes that the Indian markets are getting better with time in terms of efficiency as abnormalities have been lowered significantly. This study will help investors, mutual funds and traders to understand the efficiency and to diversify their risk and returns by investing and trading in the right sectors at the right time.

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