RELATIONSHIP BETWEEN INDIAN AND CHINESE STOCK MARKETS WITH REFERENCE TO SHANGHAI AND NIFTY INDICES

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Abstract

In modern economy global markets are integrated with each other. The study has considered the Nifty as an index of Indian stock market and Shanghai as an index of Chinese stock market as benchmark indices and applied VECM to know the relationship between the Indian and Chinese stock markets. .The ordinary least square method has been also applied and the results indicate that the Shanghai is having the significant impact on Nifty. This study is useful to the stock market investors of both the countries to diversify their investments accordingly based on the relationship and impact between the stock markets of both the countries.

Keywords: Nifty, Shanghai, Vector Error Correction Model, Vector Auto Regression, Wald Test, Ordinary Least Square Method.

Introduction

India and China have a history of bilateral relations since the mid-1980s. There has been a tremendous pace in the relationship between Asia's two giants and the world. Both nations have seen the difficulties over the years. India and China are Asia's two largest and most dynamic economies establishing new trends in global relations. Various efforts were made to leverage their economic strengths and to enhance financial relationship between them. The trade contract between India and China was concluded in 1984, giving them Most Favoured Nation (MFN) Status. Since 1992, both the economies were involved in a comprehensive bilateral trade relationship. India and China by signing a fiscal agreement in 1994 embarked a new era of economic relations between them.

In recent times China has been emerged as an India's top trading partner. In view of rapid growth in Indian and Chinese stock markets, many investors would certainly consider investing in the two markets rather than investing in other advanced and developing countries stock markets. Hence, the present study has focused on the relationship between Indian and Chinese stock markets by taking into consideration of the Shanghai and Nifty

the two major indices from both markets. It also emphasises whether the relationship is long run or short run so as to enable the beneficiaries to plan accordingly.

OBJECTIVES OF THE STUDY

The primary objective of the study is to identify the relationship between the Indian and Chinese stock markets. However the following two are identified as the sub objectives of the study.

1. To study the long run or short-run relationship between Shanghai index and Nifty index.
2. To examine the effect of Shanghai stock prices on Nifty Stock prices.

HYPOTHESIS OF THE STUDY

$H0_1$: There is no long run relationship between Shanghai and Nifty stock markets.

$H0_2$: There is no significant impact of Shanghai index on Nifty index.

RESEARCH   METHODOLOGY

The study has been undertaken to analyse the long run or short run relationship between the two major benchmark indices of Shanghai and Nifty. The historical time series data from year 2013-14 to 2018-19 of Shanghai and Nifty has been derived through secondary sources. Various statistical tools like Vector Auto Regression Model to know the relationship between Shanghai and Nifty and to examine the impact Ordinary Least Square Method have been applied.

Correlation Test: The correlation test for each index provides an indication of strength of association between the indices of different stock markets.

The Granger Causality Test: The analysis of stock market integration is extended employing Ganger Causality test.

VECM: To know the relationship between endogenous and exogenous variables relating to Long run and Short run VECM is used, as it adds error correction features to a multi-factor model known as Vector Auto Regression (VAR).

Ordinary Least Square Method: To examine the influence of Shanghai stock prices on Nifty stock prices, Least Square Method along with Leverage plots has been applied. With the help of co-efficient values, impact will be known and significance of this study is derived through probability value.

Data Analysis and Findings

The study applied Vector Error Correction Model to know the relationship between the Indian and Chinese stock markets and to study the influence or impact of Shanghai over Nifty the Ordinary Least Squares Method is adopted. Whether the relationship is long run or short run is also analysed by applying Wald test.

DATA TABULATION

Table-1: Shanghai vs. Nifty VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria						
Endogenous variables: SHANGHAI						
Exogenous variables: C NIFTY						
Sample: 1 60						
Included observations: 55						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-408.3753	NA	177174.7	14.92274	14.99573	14.95096
1	-376.2168	60.80874	57064.24	13.78970	13.89919	13.83204
2	-370.6327	10.35593*	48309.72*	13.62301*	13.76900*	13.67946*
3	-370.5791	0.097398	50013.58	13.65742	13.83991	13.72799
4	-370.4800	0.176601	51698.17	13.69018	13.90916	13.77487
5	-369.3932	1.897035	51561.78	13.68703	13.94250	13.78582
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Note: MP - Market Price, DPR – Dividend Payout Ratio DY- Dividend Yield, FPE- Final prediction Error, AIC-Akaike Information Criterion, SC- Schwarz Information Criterion,HQ-Hannan-Quinn Information Criterion.

The data of the table shows the criteria for selecting the VAR lag order for dependent variable Shanghai and independent variable Nifty. The test took into consideration the criterion of LR statistics test, FPE, AIC, SIC and HQ, which indicates that Lag 2 is the best order selection to estimate the model and that Lag 2, meets all the conditions. It therefore concluded that Lag 2 is the right fit for VECM.

Table-2: Shanghai vs. Nifty Vector Error Correction Estimates

Vector Error Correction Estimates		
Sample (adjusted): 4 60		
Included observations: 57 after adjustments		
Standard errors in ( ) & t-statistics in [ ]		
Cointegrating Eq:	CointEq1	
NIFTY(-1)	1.000000	

SHANGHAI(-1)	17.10899	
	(5.04616)	
	[3.39050]	
C	-62488.54	
Error Correction:	D(NIFTY)	D(SHANGHAI)
CointEq1	0.009140	0.012109
	(0.00634)	(0.00393)
	[-1.44214]	[-3.07809]
D(NIFTY(-1))	0.132961	0.057141
	(0.13328)	(0.08273)
	[-0.99764]	[-0.69070]
D(NIFTY(-2))	0.293980	0.036755
	(0.13729)	(0.08522)
	[-2.14132]	[-0.43129]
D(SHANGHAI(-1))	0.324491	0.404456
	(0.20446)	(0.12692)
	[1.58706]	[3.18677]
D(SHANGHAI(-2))	0.014062	-0.040344
	(0.21993)	(0.13652)
	[0.06394]	[-0.29552]
C	92.22351	14.94323
	(47.6463)	(29.5761)
	[1.93559]	[0.50525]
R-squared	0.646871	0.668120
Adj. R-squared	0.63231	0.696367
Sum sq. resids	6099636.	2350327.
S.E. equation	345.8334	214.6738
F-statistic	1.755992	3.736702

Log likelihood	-410.9291	-383.7494
Akaike AIC	14.62909	13.67542
Schwarz SC	14.84415	13.89048
Mean dependent	70.64650	15.38205
S.D. dependent	357.3145	239.4694
Determinant resid covariance (dof adj.)	5.511209	
Determinant resid covariance	4.413509	
Log likelihood	-794.6783	
Akaike information criterion	28.37468	
Schwarz criterion	28.87648	
Number of coefficients	14	

The above table calculations illustrated the relationship between two indices i.e. Shanghai and Nifty. The result indicates that the relationship exists between Shanghai and Nifty as the coefficient values are not equal to zero under the lag 2 criteria. Further, the analysed Adjusted R-square of this model seems to be above 0.60 which indicates the goodness of fit is strong.

Wald Test: To know whether the relationship between the indices is long run or short run the Wald test has been applied.

The following is the equation of Wald Test:

$D(NIFTY) = C(1)*(NIFTY(-1) + 17.1089858996*SHANGHAI(-1) - 62488.5419952) + C(2)*D(NIFTY(-1)) + C(3)*D(SHANGHAI(-1)) + C(4)*D(NIFTY(-2)) + C(5)*D (SHA NGHAI(-2)) + C(6)$

Test of Hypotheses:

H0: There is no long run relationship between Shanghai and Nifty

H1: There is a long run relationship between Shanghai and Nifty

Table-3: Shanghai vs. Nifty Wald Test

Wald Test:			
System: %system			
Test Statistic	Value	Df	Probability
Chi-square	9.297894	3	0.0310
Null Hypothesis: C(1)=C(3)=C(5)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.

C(1)	-0.009140	0.006338
C(3)	0.324491	0.204460
C(5)	0.014062	0.219926
Restrictions are linear in coefficients.		

The above table signifies the Wald test regarding the short or long run relationship between Shanghai and Nifty. The result indicates that Shanghai index is having the long run relationship with Nifty as the chi square value (9.297) is above the critical value (7.815) and probability value is observed to be statistically significant at 5 per cent level i.e. less than 0.05. Hence concluded that there is a long run relationship between Shanghai and Nifty implies Null Hypothesis is rejected and Alternative Hypothesis is accepted.

H0: There is no significant impact of Shanghai on Nifty

**H1:** There is a significant impact of Shanghai on Nifty

Table- 4: Impact of Shanghai on Nifty

Dependent Variable: NIFTY				
Method: Least Squares				
Sample: 1 60				
Included observations: 60				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9092.753	1082.285	8.401441	0.0000
SHANGHAI	0.033232	0.347357	0.095672	0.0241
R-squared	0.700158	Mean dependent var		9195.031
Adjusted R-squared	0.717081	S.D. dependent var		1296.176
S.E. of regression	1307.199	Akaike info criterion		17.22193
Sum squared resid	99108551	Schwarz criterion		17.29174
Log likelihood	-514.6578	Hannan-Quinn criter.		17.24923
F-statistic	0.009153	Durbin-Watson stat		1.76122
Prob(F-statistic)	0.024111			

The above least square values depict that the Impact of Shanghai on Nifty. The result indicates that Shanghai has a positive and significant impact on Nifty considering its coefficient value as 0.033 and the probability value observed to be less than 0.05 i.e. statistically significant at 5% level. Further the analysis reveals that Adjusted R squared value is above 0.60 and Durbin Watson lies within the range of 1.5 and 2.5, implies that the data is

normally distributed and the model is strongly fit. Hence concluded that there is a significant impact between Shanghai and Nifty i.e. rejection of H0 and acceptance of H1.

Figure – 1: Shanghai vs. Nifty Leverage Plots
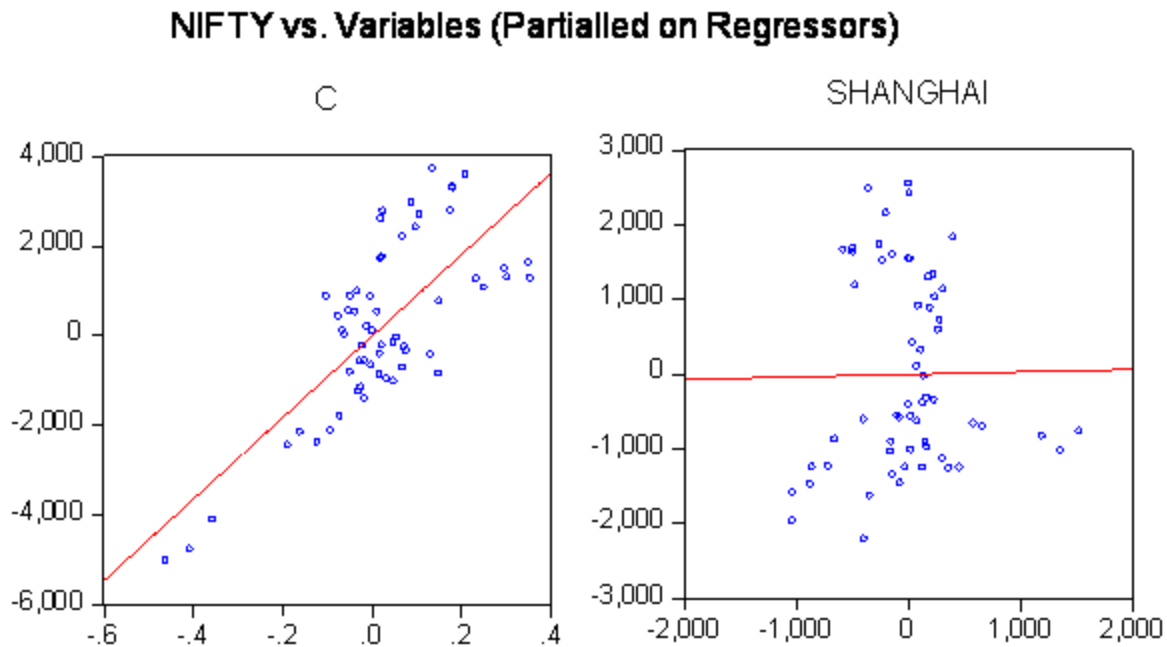
The above Leverage plots graph estimated to know the impact of Chinese Indices Shanghai on Indian Indices Nifty. As the graph explains, the plotted line is constant which shows that the positive influence of Shanghai over Nifty.

FINDINGS OF THE STUDY

➢ Through the present study it found that there is positive relationship between Shanghai and Nifty by considering its co-efficient Values.

➢ The study examined that the chi square value (9.297) is greater than the critical value (7.815) which indicates that there is a significant long run relationship between Shanghai and Nifty at 5 per cent significance level.

➢ The study synchronised that to know the influence of shanghai over nifty, the model of goodness strongly fits and the data is normally distributed for the analysis

➢ The study analysed that there is a significant impact of shanghai stock prices on nifty stock prices at 5 per cent significance level.

CONCLUSION OF THE STUDY

The present study has been emphasized on the relationship of Indian and Chinese stock markets. Various statistical methods have been applied to know the result for the framed objectives. Vector Auto Regression model has been applied to know the relationship between the Shanghai and Nifty and found that there is long run relationship between them. The ordinary least square method has been applied to know the impact of Shanghai

on Nifty and the resultant states that the Nifty got influenced by the Shanghai significantly. Hence, there is a need to do the further research in this area by considering the global economic factors influence on Indian and Chinese stock markets.

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