# Impact of US on Chinese and Indian Stock Markets Post Asian Financial Crisis

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## ABSTRACT

**Purpose**: The primary objective of the study has been to find out causal nexus between Indian, Chinese and US stock markets after the Asian financial crisis.

**Design/Methodology/Approach**: The two variables in a study may be analysed with the help of cause and effect relationship. The multivariate relationship between India, USA and China between 1997-2019 has been studied with the help of Granger Causality.

**Findings**: The weekly data points revealed that there exists a causal effect from USA to India and China. Also, it has been found that there is a causal linkage running from India to China. However, the reversal may not hold good significantly. The rising linkages between the three economies may be the core driver for influencing the inter-relationship between their stock markets. It also reflects that developed nation has been able to cause developing nations even in an integrated economy.

## Introduction

Globalization of the world economy has led to increase in the interdependency of developed and developing economies of Asia. The causal nexus between the economies has been studied by several researchers and a mixed proportion of findings have been observed for the nations. The long run and short run equilibrium have been shown in many studies and vice versa for India, USA and China. The motivation for the present study has been derived from the ongoing conflict between the superpower; USA and the developing economy of China. India stays as an interconnection to both the economies and may not afford to take a risk to spoil its trade relations with USA as well as China. The stock market linkages for these nations have been studied since 1997; the period of Asian financial crisis. The objective of the study may be briefly stated as to find out the causality running from one nation to another in the triangular linkage of India-USA-China.

## India and America Duo

The relationships between India and USA had undergone a turnaround in 1954 when India entered into a strategic alliance with Soviet Union to counter Pakistan and USA relations. Further, in 1961 India joined non-aligned movement to fight the cold war between USA and Soviet Union. The war of 1971 among India and Pakistan affected the Indo-American relations till the dissolution of Soviet Union in 1991. It was in 1990s that the foreign policy adopted closer ties with USA and adapted to the world of power within the international system. It was in the start of 21st century that USA aggressively accommodated India for bilateral trade and investment. Post 2014 India and USA shared an expanding economic relationship which has led to building confidence among them especially in information technology industry. The trade pact may further strengthen following the positive relationships between the ongoing governments.

## Sino-India tie ups

Since 1950 India has been the second nation among the non-socialist nations to establish diplomatic relations with China. The famous five principles of peace and harmony persisted from the time of leaders in 1954 in the two nations. The war of 1962 destroyed the terms between nations for a period of fifteen years followed by trade agreement for most favored nation in 1984. The border ties improved after a long span of thirty years in 1990s reaching to an agreement for trade exchanges in 2003. Indo-China association popularly known as Sino-India has been on the rise post 2000 barring minor hiccups. The second and fourth largest economies of the world have been among the fastest growing countries and increasingly inter-linked with each other through trade. The non-political interest has been responsible for ignorance towards India in South-east Asia and Africa. However, China may not afford to snub India due to its economic relations.

## USA-China Association

The relationship between USA and China has been on the rise in terms of economic ties with constructive political issues. China being the second largest and USA the largest economy of the world have been developing strong inter-linkages since USA's independence in eighteenth century. The treaty of Wangxia in 1844 promoted diplomatic relations for the two nations. Further, there has been a ban on immigration for skilled and unskilled labour from China in 1882 for ten years which has been reviewed a number of time for sixty years. A violent revolt in China in 1899 resulted in a foreign domination for the nation followed by an eight nation alliance in 1990 including USA. The open door policy created positive links for the two nations, USA supported China in 1937 against the Japanese secret alliances. 1941-1979 time period has been hostile for China-USA relations. However, post 1960s showed an improvement due to relaxation in trade barriers. The economic cooperation and rivalry due to mutual suspicions coexist for the two nations with open conflicts over Korean war and Vietnam war. US had formally recognized China in 1979 following the Sino-American defense treaty. China's human rights violation has been deeply responsible for deterioration in the association of nations post 1989. Sino-American relations improved post 9/11 attacks following round of dialogue in 2003. The trade relations had strongly improved after 2008 recession in USA with US Government recognition of the Chinese involvement for USA and the world as a whole. US actions have been opposed post 2017 by the Chinese Government over political and military issues. The recent ban imposed by the Chinese Government on equipment sale to Huwaei and visa restrictions by US Government for Chinese students and scholars to name a few have prompted a cold war between the duo.

## Literature Review

The USA returns and bears have been found to be significant predictors of Asian stock market returns and bears using Markov-switching model. Investors may use the predictive model to forecast returns in Asian markets (Malik and Mumtaz, 2019). A strong contagion effect of US sub-prime crisis has been observed for Indian stock markets. The Granger causality was not found for any of the three markets across India, USA and China. But, there has been a strong cointegration between India-USA and India-China. There may be policy implications from association between stock markets wherein stability in USA and China may influence the growth and volatility of Indian markets (Kumar and Singh, 2016). It has been found using game theory perspective that there is a global supremacy existing between India, USA and China. It can be through cooperation only that these three nations may have better economic and political relations (Indibara, 2014). The triangular linkage across FDI, exchange rate and exports between India-USA has been found to be cointegrated in the long run and feedback effects have been observed in the short run (Rahman and Mustafa, 2015). The cointegration and causal linkages between Asian stock markets have been found to be strong using monthly data. It may be derived from the study with VECM approach that Indian stock markets have linkages with Chinese markets (Patel, 2013). Indian and US stock markets have been found to be related to each other in the long run but with a longer time window to resort to equilibrium. They have been found to be strongly related in the short run leaving more scope for international diversification for the investors (Samadder and Bhunia, 2018). The linkage between Brazil, India and Russia has been found to exist in the short run using VAR and granger causality. However, US and China have not been found to influence each other in the short run. A significant influence has been found with the crude oil prices and Chinese market movements (Muruganandan et.al, 2017). An investor may find industry wise diversification better over country wise diversification while deciding to invest in Chinese

stock markets (Nguyen and Elisabeta, 2016). Indian stock markets have shown causal relationship with other Asian markets in the short run. The long run equilibrium however has been found to be missing for these markets (Rajkumar, 2015). The results concluded that India, USA and China were not integrated in the long run. However, USA granger caused India and India caused China in the short run (Raj and Marcus, 2019). The linkage between US and Asian stock markets has been observed to be higher in post crisis period. The cointegrating vectors have been significantly shown in the study between 2007-09 (Zafar and Sharma, 2012). Strong cointegration has been observed in the long run between India, Japan, Hong Kong, China, Singapore, Malaysia and Australia (Veerappa, 2016).

## Research Methodology

The two variables in a study may be analysed with the help of cause and effect relationship (Granger CWG, 1969). The study has applied pair wise Granger Causality between India, USA and China for a period between 1997-2019. The weekly historical stock market indices have been taken for Sensex, SSE Composite and S & P 500 for India, China and USA respectively. These data points have been tested for unit root with the help of ADF test. Following, the unit root test the pair wise Granger Causality has been applied after converting data into growth series. The results of causal nexus between the three nations have been discussed in the next segment.

## Findings & Analysis

The estimation output of the data points may be categorized into two parts; 1) Unit root results 2) Pair wise Granger Causality results. The results for testing time series for unit root (Augmented Dickey-Fuller) may be presented below:

**Table 1: ADF test for Sensex (India)**

*HO: Sensex has a unit root*

| Assumption for test | Level | First Difference |
|---|---|---|
| Intercept | 0.582 (0.989) | -32.945* (4.32E-30) |
| Trend & Intercept | -2.480 (0.337) | -32.985* (6.39E-58) |
| Without Trend | 2.230 (0.994) | -32.810* (1.01E-27) |

It may be inferred from Table 1 above that Sensex has been found to be non-stationary at level with all assumptions and turned stationary with first difference at 5% level of significance.

**Table 2: ADF test for SSE Composite (China)**

*HO: SSE Composite has a unit root*

| Assumption for test | Level | First Difference |
|---|---|---|
| Intercept | -2.014 (0.280) | -30.871* (2.04E-35) |
| Trend & Intercept | -2.423 (0.367) | -30.859* (6.39E-58) |
| Without Trend | -0.228 (0.603) | -30.876* (3.55E-32) |

SSE Composite series has been tested for unit root at 5% level of significance. It has been found that the series were non-stationary at level and were found stationary when tested with first difference (Table 2).

**Table 3: ADF test for S & P 500 (USA)**

*HO: S & P 500 has a unit root*

| Assumption for test | Level | First Difference |
|---|---|---|
| Intercept | 0.758 (0.993) | -37.629* (2.94E-16) |
| Trend & Intercept | -0.702 (0.971) | -37.683* (6.39E-58) |
| Without Trend | 2.160 (0.993) | -37.524* 2.53E-15 |

The table above shows results for unit root test at level and at first difference. It may be observed from the results that series has been found non-stationary at level and stationary with first difference at 5% level of significance.

**Table 4: Pair wise Granger Causality for India, USA and China (5% level of significance)**

| Null Hypothesis (HO) | Obs | F-Statistic | Prob. | Hypothesis Accepted/ Rejected |
|---|---|---|---|---|
| USA does not Granger Cause INDIA | 1136 | 18.441 | 1.31E-08 | Rejected |
| INDIA does not Granger Cause USA | | 0.577 | 0.561 | Accepted |
| CHINA does not Granger Cause INDIA | 1136 | 0.072 | 0.930 | Accepted |
| INDIA does not Granger Cause CHINA | | 6.556 | 0.001 | Rejected |
| CHINA does not Granger Cause USA | 1136 | 1.723 | 0.178 | Accepted |
| USA does not Granger Cause CHINA | | 11.496 | 1.14E-05 | Rejected |

Table 4 shows results for pair wise granger causality applied on growth series of data points (as series should be

stationary for interpreting the results). It may be inferred with the help of null hypotheses and probability values reflected in each row that whether variable in consideration has a causal relation with the other or not.

It has been strongly found that USA granger causes India (p-value; 1.31E-08) meaning that Indian markets have been found to be affected by US markets. However, the reverse has not been found to exist (p-value; 0.561) meaning that Indian markets may not have caused US markets post Asian financial crisis. The granger causality has not been found running from China to India (p-value; 0.930) meaning that Indian markets may not be caused by Chinese markets in the long and short run. However, India has been found to granger cause China (p-value; 0.001) which indicated that Indian markets may impact Chinese markets in the short as well as long run. Further, China has not been found to significantly impact US markets (p-value; 0.178) but US markets have been found to granger cause Chinese markets in the long and short run (p-value; 1.14E-05).

Thus, it may be deduced from the results that USA being the super power has been found to strongly impact China and India in the long and short run. The increasing globalization and integration of the world markets may be one of the factors for the causal nexus between the three nations. Also, China and India being the developing nations and having strong trade relations with USA may be caused by US markets. In addition to this, the stock market linkages may tend to rise with the increasing trade volume between the three nations. The inter-dependency of nations may be one of the most relevant drivers behind the causal effect.

## Conclusion and Scope for further study

The results from the study revealed that India and China have been found to be caused by USA in long and short run. The association between the developed and developing nations may be on the rise due to increasing trade treaties especially since 2004. In spite of the political cold war between the nations none of the countries may afford to lose the trade volume with each other as the same contributes a major portion to their GDPs. Moreover, from investment point of view, an investor may no longer be able to diversify by plugging his funds in these three different markets. But the same needs to be verified with other models like cointegration, ARCH/GARCH, ARIMA to name a few. The output from the study may act as a basis for framing a new structure for digging deeper into India-USA-China ties. The daily and monthly data may also be incorporated for including different angles in the study.

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