

## IMPACT OF DEVALUATION OF CHINESE YUAN ON GLOBAL STOCK MARKETS

Amarjit Saini\* and Minakshi\*

**Abstract:** *Disruptions in the global corporate world are a common phenomenon. The important is to note the reactions of global players, companies or economy as a whole at disruptive changes. If they see the disruption as a threat, they tend to overreact, committing too many resources too quickly. The present study monitors the impact of devaluation of domestic currency Yuan by China on prominent stock exchanges of Asia, Europe and America. The study is focused upon the immediate market reaction by global stock exchanges at this economic event. The non-parametric Kolari and Pynnönen (GRANK) test has been applied to examine the reactions of prominent stock markets in the short-term period of twenty days. The study revealed the negative market reactions at the announcement of this disruptive change by China. Finally, the global financial market has not welcomed this mammoth economic move.*

**JEL Classification:** G14, G15

**Keywords:** Disruptive, Global, Market and Announcement.

### INTRODUCTION

The growth of an economy has always been an apple of everybody's eye. The region wise and country wise patterns of growth of the economies vary up to an enormous extent. Political and economic changes may develop or impede the growth of the economies based upon natural resources, technological advancements, capital formation, international relations, political and economic stability. The current era of the global economy, a product of economic globalisation, is creating strong, though variable, national economic growth and development worldwide (Jones, 2005). Disruptions in today's era of global economy are very common phenomenon; the predominant dimension which matters is reactions of different economic players towards these unexpected and sudden changes in the dynamic global environment. Recently in 2015, one disruptive step taken by the Chinese Government was like an earthquake for the growing economies of the world. In August 2015, Chinese Government surprised the global markets all over the world by devaluing its currency by 1.9% against U.S. dollar, leaving behind several questions for the whole economies of the world. The present study is an

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\* Assistant Professor, School of Business, Lovely Professional University, Punjab

attempt to monitor the reactions of global stock markets at this event in a short span of time. Several researches have been conducted to study the impact of different announcements on emerging stock markets. Most of the studies are conducted using parametric tests like event study, GARCH model and E-GARCH model. The present study is conducted by using non-parametric Kolari and Pynnönen (GRANK) test to measure the impact of Yuan devaluation on emerging markets in the global business environment.

The results of the paper revealed that any important financial announcement by a country significantly affects the developed and developing economies of the world. The study has found a very strong connection between global stock markets. Results of the study indicate that announcement made by China had a very drastic impact on the performance of the Asian and European stock markets. The paper is further organised into different sections. Section 2 reviews distinctive literature regarding the behaviours of global markets towards different announcements. Section 3 exhibit methods and data used in the study. Section 4 contains results of the study. Finally, conclusion is given in section 5.

## REVIEW OF LITERATURE

Georgiadis and Grab (2015) examined that announcement of the extended asset purchase programme had an impact on the global equity prices, bond yields and the euro exchange rates. They found that announcement of EAPP resulted in increased prices of equity in the Euro area and rest of the world and also caused depreciation in the emerging market economies currencies and Euro currencies. Bhuvaneshwari and Ramya (2014) are of the view that announcements related to stock splits of the companies have a significant impact on the prices of shares and investors earn the abnormal returns due to stock split announcements. Duca and Stracca (2014) examined that G20 summits has short term impact on the global financial markets, but the impact is inconsistent on bond prices and stock prices except Govt. bond yields on in advanced countries. Mishra et al. (2014) analysed that the Fed tapering announcements have a significant impact on the emerging global markets and they also found that countries having strong tie up with China can reduce the impact of market reactions when no bad news emanates from China. Mastronardi *et al.* (2013) analysed that foreign news announcements as well as domestic news announcements have significant impact on the Italian equity market. Ramachandran (2013) examined that stock prices are not influence by the release of information by the companies regarding bonus issue, dividend, stock splits and mergers in any significant way and therefore investors are not able to reap abnormal returns from any such information. Bharath and Shankar (2012) in their study examined the efficiency of Indian stock market in the semi strong form of EMH. They have analysed that investors are not able to reap abnormal returns from the past and publicly available information in the market

and the new information is quickly absorbed by the stock prices. Beltratti *et al.* (2011) analysed that there is significant relationship between share market and share reforms announcements by China. Gumus *et al.* (2011) analysed that foreign macroeconomic news announcements do not have any significant impact on the Istanbul stock exchange, whereas domestic news announcements impacts the volatility of the stock market. Singh (2010) found that stock markets get affected by the different political and economic events in India and outside India as well, therefore investors should be aware about these affects so that they can take appropriate decisions for their investment purposes. Cai *et al.* (2009) analysed that macroeconomic news by U.S. has a major impact on the exchange rate of emerging markets, but most of the domestic news do not have any impact, uncertainty of the market also affects exchange rate of the different emerging markets but it varies across currencies and news. Nikkinen *et al.* (2006) are of the view that macroeconomic news announcements of U.S. affects the global stock markets, but the degree of impact varies across nations. The results shows that importance of the news released by U.S. is similar for European countries, developed Asian countries and emerging Asian countries, on the other side, Latin American countries and transition economies are not affected by U.S. news announcements.

The Literature review revealed that most of the studies were conducted using parametric test, but, the nature of the stock price data is not normally distributed and therefore present study has been conducted using non-parametric Kolari and Pynnönen (GRANK) test for analysing the data in a better way.

## **MATERIALS AND METHODS**

### **Objectives and Hypothesis**

The study is focused upon the announcement of Yuan devaluation by China on the prominent stock exchanges of Asia, Europe and America. Being considering this event as of global eminence, the composite effect of this move has also been monitored for the following hypothesis

*Ho: Yuan devaluation announcement has no impact on the bench mark indices of global stock exchanges.*

### **Research Design**

The present study is empirical in nature that validates the effect of events of international importance in financial sector. The study is testing the impact of devaluation of domestic currency of China on global indices, viz. Dow Jones (USA), Kospi (Korea), Nikkie (Japan), FTSE (UK) and Sensex (India) for an event window period of eleven days from 04 August 2015 to 18 August 2015.

### Data Collection and Analysis

The daily closing values of all the prominent benchmark indices has been collected from the renowned database Bloomberg. The time series data has been analysed with the descriptive and inferential methods of statistics. The non-parametric Kolari and Pynnönen (GRANK) test has been applied to examine the reactions of prominent stock markets in the short-term period of eleven days. Still many other researchers have supported the relevance of parametric test in these types of studies. Bloom (2011) recognized the strength and support of non-parametric tests along with the parametric tests. In that context the results of non-parametric has also been confirmed by t-test application on Average Abnormal Returns (AARs).

### RESULTS AND DISCUSSION

The time series data of global stock exchange has been analysed primarily with the help of descriptive measures of statistics. The correlation of all the global indices with the Chinese stock market index Hangsang revealed a positive and significant relationship except the Indian stock market index Sensex. The positive and significant correlation is the sign of coupling among the trend of these stock exchanges (Table 1). But the movement of Sensex is not in line with these global indices.

**Table 1**  
**Results of Correlation Sets of Global Stock Indices with Hangsang**

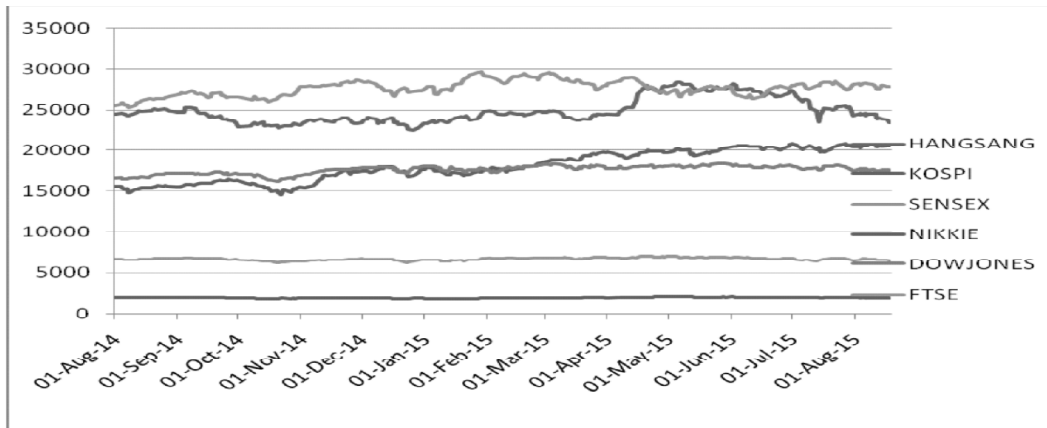
<i>S.No</i>	<i>Global Index</i>	<i>Correlation Coefficient</i>	<i>p-Value</i>
1.	DOWJONES	0.503	0.000*
2.	FTSE	0.703	0.000*
3.	KOSPI	0.831	0.000*
4.	NIKKIE	0.671	0.000*
5.	SENSEX	-0.067	0.291

*Source:* Authors' calculations from the data compiled from Bloomberg

\*Values significant at 1% level.

The aforesaid coupling effect has been monitored on the basis of last one year's bench mark index movements of all the global stock exchanges from the day back of Chinese Yuan devaluation announcement. The Figure-1 depicts the trend line of all the global indices of under study. The Sensex and Hangsang indices are found to be at contrast since April 2015. The relationship statistics results are in favour to apply further the GRANK test.

The non-parametric Kolari and Pynnönen (GRANK) test has been applied upon a short event window of eleven days, that is (-5, 0, +5). The estimation window



**Figure 1: Trends of Global Stock Market Index Movements from Aug 2014 to Aug 2015**

Source: Based upon the calculations from the data compiled from Bloomberg

has been taken as returns of 249 days prior to this event. Here, the daily natural log returns are calculated to establish a relationship between the Hangsang and other global index under study. The expected return during the event window period of eleven days for a particular market index is calculated by the following OLS single factor regression model.

$$E(R_t) = \alpha + \beta * R_{mt} + \varepsilon_t$$

Where;

$E(R_t)$  = Expected return for Index  $j$  at time  $t$

$\alpha$  = Estimate of the intercept of the market model regression.

$\beta$  = Estimate of the coefficient in the market model regression, measures the sensitivity of the Index  $j$  to the HANGSANG

$R_{mt}$  = Return for Index  $j$  at time  $t$

The abnormal return calculated from the above model for each of the index is further ranked for the return of estimation window of 249 days and event window of eleven days. The higher negative return got the least rank and vice-versa. The average rank is calculated for all the global indices for the same day and compared with the mean rank of 130.55 (calculated from the ranks given to estimation plus event window; 1-260) and compared with the following formula to test the GRANK at 1% level of significance.

$$GRANK = \frac{\sqrt{d} \sum (K_t - Mean Rank)}{\sum_{t=1}^n (K_t - Mean Rank)^2 / n}$$

Where ' $KD$ ' is the average rank of event window, ' $d$ ' is the length of estimation window, ' $n$ ' is the length of estimation window plus event window.

Here, the  $d = 249$  and  $n = 260$

By applying the methodology on all the global stock indices on consolidated the following results have been ascertained. It is from the GRANK results Table 2 that the average rank for the event window period is 111.52, whereas the mean rank for the estimation and event window period is 130.5. The average rank is found below than the mean rank. It shows negative reactions of global stock markets at the announcement of yuan devaluation.

**Table 2**  
**GRANK-test Statistics Results for the Event Window of (-5, 0, +5)**

<i>Estimation Window</i>	<i>Event Window</i>	<i>Average Rank</i>	<i>Mean Rank</i>	<i>GRANK Value</i>	<i>p-Value</i>
249 days	11 days	111.52	130.5	-7.504	0.000*

*Source:* Authors' calculations from the data compiled from Bloomberg

\*Values significant at 1% level.

The GRANK value for the event window period is -7.504, which is found highly significant. The results of non-parametric test reject the null hypothesis, that is, Yuan devaluation announcement has no impact on the benchmark indices of global stock exchanges. The results of study revealed a strong negative market reaction by the global stock exchanges at the announcement of Yuan devaluation. The results of the non-parametric tests have been found robust by several studies. In order to validate and confirm the results of GRANK test the parametric t-test has also been applied upon average abnormal returns. The parametric test helps in having in-depth analysis of global stock market indices. The results of t-test are shown in Table-3. The market reactions of all the global stock exchanges have found to be negative on the day of announcement. The t-value on 11-August-2015 is found highly significant at 1% level of significance. Apart from the same the stock markets were in negative zone on the next day of this event, where the average abnormal return is significantly negative at 5% level. A significantly negative average abnormal return has also been registered by the global stock markets two days before this event. It can be considered as the existence of prior information in the market domain.

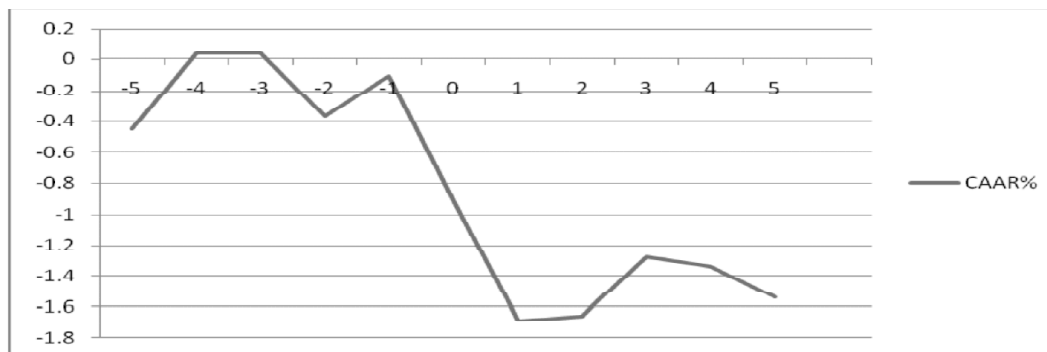
The results of cumulative average abnormal returns during the event window of eleven days are depicted in Figure-2. It is evident from the figure that prior to announcement of this event, CAAR as on (-4<sup>th</sup> and -3<sup>rd</sup>) is found positive. But after the announcement of this event, it is declining very sharply and remains in the negative zone for the entire post-event window period of five days. It reflects the negative reactions of global stock markets at this event.

**Table 3**  
**Cumulative and Average Abnormal Returns during Event Window Period**

DAY	AAR	t-VALUE	CAAR	AAR%	CAAR%
-5	-0.005	-2.496	-0.005	-0.451	-0.451
-4	0.005	2.437	0.000	0.490	0.039
-3	0.000	-0.016	0.000	-0.003	0.036
-2	-0.004	-2.698*	-0.004	-0.406	-0.370
-1	0.003	0.836	-0.001	0.264	-0.105
11-Aug-2015	-0.008	-4.857**	-0.009	-0.804	-0.909
1	-0.008	-2.745*	-0.017	-0.776	-1.685
2	0.000	0.113	-0.017	0.025	-1.660
3	0.004	0.963	-0.013	0.384	-1.277
4	-0.001	-0.224	-0.013	-0.061	-1.337
5	-0.002	-2.433	-0.015	-0.201	-1.538

Source: Authors' calculations from the data compiled from Bloomberg

\*\*Values significant at 1% level, \*Values significant at 5% level



**Figure 2: Cumulative Average Abnormal return during Event Window Period**

Source: Based upon the claculations from the data compiled from Bloomberg

## CONCLUSION

The results of the study have confirmed the inter-linkage between the global markets. Both the parametric and non-parametric test results have been found negatively significant. The markets reactions have been found negative at the announcement of yuan devaluation. The so called announcement shook the prominent global markets of developed and developing nations a lot. The present study considers the global world as single market, where the disruptive changes affect the stock markets as well as economies of various countries. It is concluded here that the strong financial moves by dominant countries have a deep and significant impact on developing and developed nations too.

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