

# IMPACT OF EXCHANGE RATE AND GLOBALIZATION ON INFLATION IN INDIA AND CHINA

Mahboob Rasul Laskar<sup>1</sup>, Singh Ashwini Shivkumar<sup>2</sup>

E-Mail Id: bhatshariq01@gmail.com

<sup>1</sup>University of Science and Technology, Meghalaya, India

<sup>2</sup>Department of commerce, Arunodaya University, Itanagar, Arunachal Pradesh, India

**Abstract-** The globalization has brought down high inflations among both developed and developing economies in the late 1990's. Most of the developing countries integrated their economies to global economy. This inflation has brought advantages in some countries and challenges in other countries. This is very important to know the influencing factors in open economies to gain the advantages of managed inflation. From the in-depth review of literature, we identified three variables such as exchange rate intervention (exchange rate, forex reserves) and globalization were having high impact on inflation in India and China. The study is based on panel data modeling using seventeen years of monthly data from January 1<sup>st</sup> 2010 to December 31<sup>st</sup> 2021 of India and China. The required data set for the selected countries were obtained from various sources. The study employed GMM estimation method to check the behavior of variables. The empirical results indicate that there is a positive correlation of independent variables with dependent variable i.e. inflation.

**Keywords:** Inflation, exchange rate, foreign exchange reserves and the Generalized Method of Moments (GMM).

## 1. INTRODUCTION

The economies of India and China are playing a very significant role in the world economic market; they gained the confidence that both the nations together can become an economic superpower. The doubt is that both these nations are developing and are affected severely by economic turbulences. Though they are performing consistently after the economic reforms in the last three decades, with the economic depression in 2008 the growth has brought down. The economists tries to know the interdependency of the variables and to know which are showing more influence on economic growth by studying different proxy variables to the economy.

This paper examines one of the proxy variables of economy, which is inflation. The high inflations among developing economies have brought down through globalization in late 1990's. Almost all developing countries opened their economies to integrate them with global economy. This inflation has brought advantages in some countries and challenges in other countries. This is very important to know the influencing factors in open economies to gain the advantages of managed inflation. From the extensive literature, the identified three variables that have high influence on inflation. The identified independent variables are exchange rate intervention (exchange rate, forex reserves), globalization. This paper examines influence of exchange rate intervention and globalization on inflation in India and China.

## 2. REVIEW OF LITERATURE

Extensive literature work is developed on the Inflation, economist try to find the behavior of inflation and its influencing variables. No inflation study is left without mentioning the work of Romer's (1993), who proposed that open economies, reduces the inflation. **Mukhtar (2010)** tested the Romer hypothesis, that there is a negative relation between inflation and trade openness for Pakistan. The empirical findings under the cointegration test establish a significant negative relationship between inflation and trade openness in the long-run, which confirms the applicability of Romer's hypothesis for Pakistan. **Samimi, Ghaderi and Sanginabadi (2011)** provided evidence on the impact of trade openness on the inflation in Iran. The study applied a bounds test approach to test the level relationship within the autoregressive distributed lag (ARDL) model proposed by **Pesaran et al. (2001)**. The empirical result shows a negative and significant effect of openness on inflation in the short run but its effect in the long run is not significant. **Barro and Gordon (1983)** argue that discretionary policies tend to raise inflation to higher, and more inefficient, levels than monetary regimes that follow well-defined rules.

**Samimi et al (2012)** the study tested the Romer (1993) hypothesis, that inflation is lower in more open economies. The study used the panel data over the last two decades in both developed and developing countries. The results cast a robust and negative relationship between trade openness and inflation. The estimated result regarding the traditional measure of trade openness indicates a positive and significant association between trade openness and inflation which opposes the view of the Romer. **García and González (2013)** the study finds the effect of country risk premium and commodity price shocks on monetary policy in small open economies. To measure the monetary policy, the strategy proposed by **Del Negro, Schorfheide, Smets, and Wouters (2007)** was applied. The results

indicate that emerging economies face more challenges in designing monetary policy than developed economies. For instance, researchers found that the risk premium shock could explain most of the variability in the real exchange rate. The results also indicate that the real exchange rate causes significant reallocation of resources across sectors in the short run. For estimation, we reviewed Generalized Method of Moments (GMM) by **Arellano and Bond (1991)**, **Holtz-Eakin et al. (1990)**, **Arellano and Bover (1995)**.

From the above literature, it is evident that most of the researchers are very keen on studying the behavior of inflation in the open economies and the results vary in all situations. The empirical evidences from the developing nations showed the impact of inflation on domestic prices and other indices. The current study tries to understand the behavior of globalization and exchange rate intervention in the economies of India and China.

### 3. DATA AND METHODOLOGY

The main objective of this study is to evaluate the impact of Exchange rate, Forex reserve and globalization on Inflation in the emerging economies of India and China with the Generalized Method of Moments (GMM).

To investigate above-mentioned relation among the variables, the study uses monthly data for the sample period from January 2000 to December 31<sup>st</sup> 2017 of India and China. The required data set has been obtained from various sources. The dependent variable inflation in study used the Consumer Price Index (CPI) to calculate the inflation percentage. The data of inflation (CPI) were collected from International Financial Statistics (IFS). The independent variables are percentage of nominal exchange rate in Federal Reserve, percentage of foreign exchange reserves in US dollar from International Financial Statistics (IFS), trade openness data that include both exports and imports were collected from Organization for Economic Co-Operation and Development (OECD) and GDP from World Bank (WB). All these variables are considered as key growth indicators in an economy. This study analyses an alternative econometric approach to the normal panel data, so the GMM models has exploited the time variation in the models and unobserved country specific effects, it has included lagged dependent variables and control endogeneity of the explanatory variables. The Panel estimator has included instrumental variables based on past realization. We can write general model of GMM

$$in_{i,t} - in_{i,t-1} = (\beta - 1)in_{i,t-1} + \beta'X_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

Where inflation is the log of variable,  $X$  (exchange rate, foreign exchange reserves and trade openness) represents set of explanatory variables,  $\eta$  is an unobserved country-specific effect,  $\varepsilon$  is the error term and the  $i$  and  $t$  represents country and time periods respectively, we write

$$in_{it} = \beta in_{it-1} + \beta'X_{it} + \eta_i + \varepsilon_{it} \quad (2)$$

Now, to eliminate the country-specific effect, take first difference of equation (2)

$$in_{i,t} - in_{i,t-1} = \beta(in_{it} - in_{it-2}) + \beta'(X_{it} - X_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad (3)$$

The instruments variables is explains by eq.(1) endogenous variables of explanatory variable dealt with eq. (2) Construction of new error term,  $\varepsilon_{it} - \varepsilon_{it-1}$  is correlated with lagged dependent variables  $in_{it-1} - in_{it-2}$ . We assume that error term is serially uncorrelated and explanatory variables  $X$  are weakly exogenous (i.e. the explanatory variables are assumed to be uncorrelated with future realizations of the error term), the GMM dynamic panel estimator uses the following moment condition

$$E[in_{it-s}(\varepsilon_{it} - \varepsilon_{it-1})] = 0 \quad \text{for} \quad s \geq 2; t = 3, \dots, T, \quad (4)$$

$$E[X_{it-s}(\varepsilon_{it} - \varepsilon_{it-1})] = 0 \quad \text{for} \quad s \geq 2; t = 3, \dots, T \quad (5)$$

The GMM estimator based on the difference estimator, these are appropriate instruments under the following additional assumption: although there may be correlation between the levels of the right-hand side variables and the country-specific select in Eq. (2), there is un-correlation between the differences of these variables and the country specific select. This assumption results from the following stationarity property,

$$E[in_{it} + p\eta_i] = E[in_{it} + q\eta_i] \quad \text{and} \quad E[X_{it} + p\eta_i] = E[X_{it} + q\eta_i] \quad (6)$$

$$E[(in_{it-s} - in_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \quad \text{for} \quad s = 1, \quad (7)$$

$$E[(X_{it-s} - X_{it-s-1})(\eta_i + \varepsilon_{it})] = 0 \quad \text{for} \quad s = 2 \quad (8)$$

Thus, we use the moment conditions explained in Eqs. (4), (5), (7), and (8) and employ a GMM procedure to generate consistent as well efficient parameter estimates **Levine et.al (2000)**.

### RESULT

The results of GMM analysis to know the relationship of exchange rate, foreign exchange reserve and trade openness on inflation are plotted below in table.1.

**Table: 1 Generalized Moment Method approach (GMM)**

Variables	Coefficient	Prob.
Constant	-6.472097	0.001
P Exchange rate	4.219227	0.004
P Forex Reserve	0.947326	0.019
Globalziation	8.351771	0.038
J-statistic	0.982	
This table provides the estimated result of Generalized Moment Method approach (GMM) for the sample period from 2001 to 2017.		

**P= Percentage**

Through these empirical results we assumed that there is a positive correlation between exchange rate, forex reserve and trade openness on the inflation which is a proxy variable of economy of both India and China. The trade openness shows positive significant, ( $p < 0.05$ ) and high coefficient (8.35) relationship with inflation, which means for every one unit increase in trade openness increases inflation by 8.35 units. The exchange rate positively highly significant ( $p < 0.01$ ), and high coefficient of 4.21 on inflation, stating that for every one unit dollar rate increases in the international market (depreciation) the inflation increases by 4.21 unit. Though forex reserves are showing positive significance ( $p < 0.01$ ), when compare to trade openness and exchange rate, the forex reserves are less coefficient with inflation by 0.94, which means for every one unit increase in forex reserves, there is a 0.94 increase in inflation. Since all the independent variables are positively influencing inflation, it rejects the null hypothesis and accept the alternate hypothesis significantly.

This is always happening in the growing economies. Increased trade openness ratio indicates increased foreign trade when GDP is constant and it is good for any country and bad if it is reverse. When Forex reserve increases in any country there is a high degree of possibility of investments and increased number of transaction thus accelerate the growth of GDP, as a result increase the inflation at lower/higher level depend upon the domestic monetary policy. As a whole in the India and China, the inflation increases as a result of increased Forex reserve. The study gives a positive correlation of exchange rate, forex reserve and trade openness on the inflation. The common feature of these two countries is that controlling of inflation is one of their main points in their monitory policy, because these countries are highly open to international trade. When there is a good exchange rate the countries will be more open which brings high investments, which accelerate the growth of the country's economy. As a result there is an increase in the inflation as observed in the both India and China.

**CONCLUSION**

This study is an attempt to document the evidence of exchange rate intervention (Exchange rate and Forex reserves) and trade openness on the economy of the India and China. The inflation is considered as one of the proxy variables to see the economy of both the nations. These two nations are highly open to the trade for their economic development and the international trade is completely depends on the exchange rate. These two variables are directly influencing on inflation in this developing economic block. With the increased exchange rate (Rupee and Yuan, currency value depreciates) the cost of production of goods will increase in the domestic market and the general prices levels will also increases. In the same way when the reserve increases, the inflation will also increases. It indicates that the accumulated reserves are generally used to control the inflation. When exchange rates are high the accumulation of reserves through exports are costly so it leads to inflation. Among the independent variables trade openness shows a highly positive relation with inflation because the globalization facilitated by liberal monetary policy which leads to high inflation. The important point is if there is any sudden rise in inflation or any crisis the in the two countries can overcome by understanding the changing behaviour of the variables in the past episodes.

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