

IMPACT OF MACROECONOMIC VARIABLES ON STOCK MARKET: A REVIEW OF LITERATURE

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***Abstract:** A large attention is being paid on various factors which impact stock market. Despite the growing literature on impact of variable on stock market, little effort has been done devoted to synthesize the overall state of art on the topic. In this paper, an attempt is being made to review the status of literature on impact of macroeconomic variables on stock market, thus to find research gap. A literature review scheme is presented. A total of 190 published articles 1961 to 2014 are reviewed. Based on review, suggestion for further research is likewise provided.*

***Keywords:** Macroeconomic variables, Literature review, Stock market.*

1. INTRODUCTION

Probably the relationship between stock prices and macroeconomic variables is well illustrated by the Dividend Discount Model (DDM) proposed by Miller and Modigliani (1961) than any other theoretical stock valuation model. According to the model the current price of an equity share equals the present value of all future cash flows to the share. Thus, the determinants of share prices are the required rate of return and expected cash flows (see Oyama, 1997; Gan et al 2006) suggesting that economic factors that influence the expected future cash flow and required rate of return affect the share price. Macroeconomic factors are significant and fundamental determinants over the long investment horizon, because, as expressed by King (1966), share prices are subject to the impact of macroeconomic factors by an average of 50%.

Large number of researches is done, to study the impact of economic variables on stock prices. This paper provides the overview of researches done and will serve as a roadmap of literature for academicians and practitioners to help stimulate further interest.

2. REVIEW OF LITERATURE

Fama investigated the relationship between economic activities and stock returns(US) and concluded that there are positive relationships between stock returns and GNP,

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money supply, capital expenditure, industrial production, and the interest rate but a negative relationship between stock returns and the inflation rate (Fama, 1981).

Geske and Roll (1983) also show that economic activity proxied by industrial output has a positive impact on stock prices through its effect on expected future cash flows.

Ta and Teo (1985) had earlier observed high correlation among six Singapore sector indices in the period 1975 to 1984 and the overall SES market return (e.g. All-S Equities Industrial and Commercial Index, SES All-S Equities Finance Index, SES All-S Equities Property Index, SES All-S Hotel Index, SES All-S Plantation Index and SES All-S Mining Index). Using daily data in examining the relationships, they had concluded that sector returns were highly correlated to each other, although such correlations did not remain stable over time.

Chen et al., (1986) used the APT model to link stock market returns in the United States (US) to a linear function of various macro-economic factors. They contended that economic forces affect the discount rate, firms' respective cash flows, and future dividend payouts. They found strong correlations between the selected macroeconomic variables and US stock market returns and concluded that industrial production, changes in the risk premium, and twists in the yield curve were the most significant factors in explaining US stock returns.

Whilst Aggarwal (1981) finds a positive relationship between stock price movements and exchange rate movement in the US, Soenen and Hennigar (1988) detect a negative relationship.

Aidoo (1989) also reported several factors such as political instability, low-growth rate, lack of entrepreneurship and inadequate demand for stocks as some of the factors that are likely to influence the performance of the GSE. The study projected massive growth of the exchange in terms of demand and supply provided the economic and political conditions remained favorable.

Martinez and Rubio (1989) tested the Spanish market return and they found that there were no significant pricing relationship between stock returns and the macroeconomic variables. Moreover, they found that the multifactor APT with macroeconomic variables fails to explain the size effect in Spanish stock returns.

Fung and Lee(1990) studied the long term relationships between stock return on the one hand and GNP, inflation and money supply on the other in Taiwan and concluded that the efficient market hypothesis is not valid for an emerging market.

For Poon and Taylor (1991), the economic variables which are used in this study include monthly and annual growth rate of industrial production, unanticipated inflation, risk premium, term structure of return on value weighted market index. To incorporate potential lead/lag relationships, the procedure carried out for each

of the market indicates the macroeconomic factors in this study. They showed that the tested macroeconomic variables do not affect the share price in the UK stock market.

Paddy (1992) contends that macroeconomic and fiscal environment is one of the building blocks which determine the success or otherwise of securities market. Conducive macroeconomic environment promotes the profitability of business which propels them to a stage where they can access securities for sustained growth. Generally, the barometers for measuring the performance of the economy include among others real GDP growth rate, rate of inflation, the exchange rate, fiscal position and the debt position.

Bahmani and Payesteh (1993) conclude that there exists a bi-directional causality between stock prices and exchange rate, at least in the short-run, although the cointegration analysis does not depict any long-term relationship between these variables.

Fang and Loo (1994) studied the relationship between stock return volatility and international trade for four Asian countries. They however, found evidence in favor of the efficient market hypothesis. Their empirical results based on vector autoregressive model (VAR) suggested that the stock return volatility in the four markets respond to information on trade.

Hardouvelis, has and et al., analyze a long-run relationship between concluded that the reaction of stock price to interest rate stock and gold prices, also oil price and currency rate in changes would be negative using American Central Bank Taiwan. They suggested that the long-run relationship discount rate as a proxy of interest rate.

Sun and Brannman (1994) similarly found a single long-run relationship among the SES All-S Equities Industrial & Commercial Index, Finance Index, Hotel Index, and Property Index from 1975 to 1992. The current study builds upon and extends the literature through the employment of Johansen's (1988) VECM to examine the long run equilibrium relationship between selected macroeconomic variables and stock market sector indices represented on the Stock Exchange of Singapore (recently demutualized and renamed the Singapore Exchange (SGX)): the Finance Index, the Property Index, and the Hotel Index. The choice of macroeconomic variables and the hypothesized relations with the sector indices are discussed next.

The impact of 18 selected macroeconomic factors on the stock market in Great Britain was investigated e.g. by Clare and Thomas (1994) who came to the conclusion that there is strong correlation between the yield of the local stock market and oil price, inflation and the volume of bank loans.

Barrows and Naka (1994) investigated how selected macroeconomic variables influence restaurant and hotel stock returns in the USA over a 27-year period. The

results suggest that the direction of macroeconomic forces is consistent across the industrial, lodging and restaurant sectors although differences in significance do occur. Barrows and Naka's study found that macroeconomic variables are able to explain the movement of restaurant stock returns to a greater extent than either the lodging or industrial sectors. The major limitation of this study is that it did not examine the time series properties of the variables before using regression analysis. The results of regression analysis are only valid when all the variables are integrated of the same order.

Mukherjee and Naka (1995), with the use of Johansen's (1998) VECM the authors analyzed the relationship between the Japanese Stock Market and exchange rate, inflation, money supply, real economic activity, long-term government bond rate, and call money rate. They concluded that a cointegrating relation indeed existed and that stock prices contributed to this relation.

Using data from 1976 to 1993 on 41 countries including both developed and developing, Levine and Zervos (1996a, b) investigated the relationship between economic growth and stock market development. They found a strong positive correlation between the stock market development and long-run economic growth after controlling for the initial level of per capita GDP, initial level of investment in human capital, political instability and measures of fiscal and monetary policies as well as exchange rate policy.

Ajayi and Mogoue (1996) establish a long-run relationship using eight industrialized countries and conclude that currency depreciation leads to negative effects on stock prices.

It is argued that there is an inverse relationship between interest rates and stock returns. Thorbecke (1997) and Smal and de Jager (2001) observe that a reduction in interest rates induces an injection of liquidity into the economy. This extra liquidity could be channeled to the stock market, driving up the demand and prices of stocks. Patelis (1997) notes that interest rate changes are helpful in predicting stock market returns over a long period. Thus, there is evidence to conclude that interest rate policies should also target stock market price movements.

Mookerjee and Yu (1997) examined the nexus between Singapore stock returns and four macroeconomic variables such as narrow money supply, broad money supply, exchange rates and foreign exchange reserves using monthly data from October 1984 to April 1993. Their analysis revealed that both narrow and broad money supply and foreign exchange reserves exhibited a long run relationship with stock prices whereas exchange rates did not.

Goswami and Jung (1997) in their study on the effects of economic factors on Korean stock market employed the VECM to verify the SR and LR relationship between stock price and nine macroeconomic variables namely; SR-IR, LR-IR,

Inflation, money supply, industrial production, oil price, balance of trade for current account and foreign exchange from two different currencies i.e. Korean won per USD and Korean won per Japanese Yen. The authors conclude that the Korean Stock prices are positively related to industrial production, inflation and SR interest rate

Applying two-stage least squares, Harris (1997) did find evidence to support the view that stock market development explains economic growth. In fact, the results indicated that for developed countries stock market development had some explanatory power on economic growth but not on developing countries. He concluded that the pool of literature that leads us to believe that the existence of stock markets might enhance economic growth is misleading or at best weak.

Ajayi et al. (1998) also show that causality runs from stock returns to movements in the exchange rates in the case of advanced markets whilst there is no significant causality either way for emerging markets.

Cheung, Ng (1998) have also confirmed positive correlation between oil prices, the money supply and GDP in Germany, Italy and Japan.

Zhao (1999) studied the relationships between stock prices in the Chinese financial market by considering inflation and the industrial production index from 1993 to 1998. The results indicate that both inflation and expected growth in industrial output have negative relationships with the stock market.

Bernanke and Gertler (1999, 2001) observe that the volatile nature of asset prices makes them hard to predict and that monetary authorities should only change interest rates in reaction to stock-price movements, when they expect such movements to affect inflation. Moreover, the credibility of interest rate policy may reduce, if interest rates change rapidly in response to asset price movements.

Kwanchanok (2000) investigated the relationships between Thailand's stock market indices (SETI) and the following macroeconomic variables: inflation rate, interest Rate, GDP, current account balance, money supply, securities trading volume, securities trading value, the value of the Thai Baht, and the currency exchange system. Kwanchanok (2000) employed monthly data from January 1994 to December 1999 and found that the inflation rate, money supply, securities trading volume, securities trading value and the currency exchange rate system have positive effects on the Thai stock market, whereas the interest rate and GDP have negative effects.

In Africa, Jefferis and Okeahalam (2000) examine the effect of macroeconomic factors on stock markets in South Africa, Zimbabwe, and Botswana. They find that stock prices have a positive long-run relationship with real GDP, and real exchange rate in South Africa and Zimbabwe and a short-run relationship with exchange rate and interest rates in Botswana. Stock prices are also negatively related to interest rates in South Africa.

Banny and Enlaw (2000) also unearthed the relationship between the exchange rate of the Malaysian Ringgit in terms of the USD and stock prices in Kuala Lumpur Stock Exchange (KLSE) through the application of single and multi-index models. Their conclusion was that a negative relationship exists between exchange rate and KLSE stock prices.

Muhammad and Rasheed (2002) also find mixed cointegration results amongst four Asian countries.

Islam (2003) replicated the above studies to examine the short-run dynamic adjustment and the long-run equilibrium relationships between four macroeconomic variables (interest rate, inflation rate, exchange rate, and the industrial productivity) and the Kuala Lumpur Stock Exchange (KLSE) Composite Index. His conclusions were similar: there existed statistically significant short-run (dynamic) and long-run (equilibrium) relationships among the macroeconomic variables and the KLSE stock returns.

Hassan (2003) employed Johansen's (1988, 1991, 1992b) and Johansen and Juselius' (1990) multivariate cointegration techniques to test for the existence of long-term relationships between share prices in the Persian Gulf region. By employing vector-error-correction model, his study also investigated the short-term dynamics of prices by testing for the existence and direction of intertemporal Granger-causality. The analyses of weekly price indices in Kuwait, Bahrain, and Oman stock markets showed that: (1) share prices were cointegrated with one cointegrating vector and two common stochastic trends driving the series, which indicates the existence of a stable, long-term equilibrium relationship between them; and (2) prices were not affected by short-term changes but were moving along the trend values of each other. Therefore, information on the price levels would be helpful for predicting their changes.

Taghavi and Janani, studied the effect of macroeconomic variables on stock price index over 1990-1998. For this purpose, cointegration and vector auto regression methods have been used. The results indicate that there is a fragile relationship among all independent (macroeconomic variables) and the dependent variable (stock price index). Taghavi and Mohammadzadeh, stated that there is a positive relationship between stock price index and both house price and exchange rate, but negative relationship between money between the index and money supply, private sector investment and oil price.

Gjerde and Sættem (1999) examined the causal relations among stock returns and macroeconomic variables in Norway. Their main focus was on the extent to which important results on relations among stock returns and macroeconomic factors from major markets are valid in Norway. Using multivariate vector autoregressive (VAR) approach they were able to establish several significant links. Their findings were

consistent with both US and Japanese findings. That is, real interest rate changes affect both stock returns and inflation, and the stock market responds accurately to oil price changes. They further found a delayed response of the stock market to changes in domestic real activity.

Sadorsky (1999) investigated the dynamic interaction between oil price and other economic variables including stock returns using an unrestricted vector auto-regression (VAR) with US data. The study found that oil price changes and oil price volatility have a significantly negative impact on real stock returns. The study also found that industrial production and interest rates responded positively to real stock returns shocks. Sadorsky, however, found that in periods subsequent to 1986, oil price shocks have significant effect on real stock returns. Above all, the study showed that oil price movements explain a larger portion of the forecast error variance in real stock returns than interest rates.

Ibrahim (1999 and 2003) investigated the dynamic interactions between the KLSE Composite Index and seven macroeconomic variables (industrial production index, money supply M1 and M2, consumer price index, foreign reserves, credit aggregates and exchange rate). The result of his studies provided evidence that Malaysian stock market was informational inefficient.

Granger et al. (2000) find no evidence of cointegration between stock prices and exchange rate for a group of Asian countries. However, the study finds significant short-run feedback effects using Granger causality tests and impulse response functional analysis.

Park and Ratti (2000) found that contractionary monetary policy shocks generate statistically significant movements in the USA inflation and expected real stock returns, and that these movements go in opposite directions. Since positive shocks to output precipitate monetary tightening, they argue that the countercyclical monetary policy process is important in explaining the negative correlation between inflation and stock returns. They report that monetary policy tightens significantly in response to positive shocks to inflation, and that the impact of monetary policy shocks on stock returns is negative and volatile. Their results provide evidence for the existence of an "anticipated policy" hypothesis.

Maysami and Koh (2000) examined such relationships in Singapore. They found that inflation, money supply growth, changes in short- and long-term interest rate and variations in exchange rate formed a cointegrating relation with changes in Singapore's stock market levels.

Papapetrou (2001) studied the dynamic relationship among the oil price, real stock prices, interest rates, real economic activity and employment with data from Greece. The study found that an oil price shock has an immediate negative impact on the stock market as well as industrial production and employment. That

is, a positive oil price shock depresses real stock returns. However, contrary to the literature, Papapetrou showed that stock returns do not rationally signal (or lead) changes in real activity and employment in his analysis since growth in industrial production and employment respond negatively to real stock returns.

Chaudhuri and Koo(2001) investigated the volatility of stock returns in some Asian emerging markets in terms of the volatility of domestic and external factors, found that both domestic macroeconomic variables and international variables have significant impact on stock return volatility. Their empirical results suggest the presence of a significant contagion effect and integration of capital market in this region. The results also suggested the role of government in terms of fiscal and monetary policy in smooth functioning of the stock market is crucial in this region.

Maysami and Sims (2002, 2001a, 2001b) employed the Error-Correction Modelling technique to examine the relationship between macroeconomic variables and stock returns in Hong Kong and Singapore (Maysami and Sim, 2002b), Malaysia and Thailand (Maysami and Sim 2001a), and Japan and Korea (Maysami and Sim 2001b). Through the employment of Hendry's (1986) approach which allows making inferences to the short-run relationship between macroeconomic variables as well as the long-run adjustment to equilibrium, they analysed the influence of interest rate, inflation, money supply, exchange rate and real activity, along with a dummy variable to capture the impact of the 1997 Asian financial crisis. The results confirmed the influence of macroeconomic variables on the stock market indices in each of the six countries under study, though the type and magnitude of the associations differed depending on the country's financial structure.

Flannery and Protopapadakis (2002) studied the relationships between US stock prices and economic announcements on a daily basis from 1980 to 1996 using the Consumer Price Index, Producer Price Index (PPI), money supply, the unemployment rate and the interest rate as economic factors. The findings demonstrated that economic announcements significantly increase stock market volatility, which affects stock returns. Moreover, because the CPI and PPI are measures of inflation, announcements of increases in these variables tend to depress the stock market. Similarly, because increases in the money supply lead to inflation and thus cause interest rates to increase, announcements of increases in the money supply also tend to decrease stock prices.

Wongbangpo and Sharma explored the relationship between the stock returns for the ASEAN-5 countries of Indonesia, Malaysia, the Philippines, Singapore, and Thailand and five macroeconomic variables. By observing both short and long run relationships between respective stock indexes and the macroeconomic variables of gross national product (GNP), the consumer price index (CPI), the money supply, the interest rate, and exchange rate they found that in the long-run all five stock price indexes were positively related to growth in output and negatively to the

aggregate price level. But a negative long-run relationship between stock prices and interest rates was noted for the Philippines, Singapore, and Thailand, and was found to be positive for Indonesia and Malaysia.

Goodhart, Mahadeva, and Spicer's (2003) research into the effect of monetary policy changes on asset prices in the foreign exchange and equity markets, which attributed failure to find monetary policy effectiveness during a crisis to policy failure and the risk premia in the financial markets of Brazil and Korea.

Islam and Watanapalachaikul (2003) showed a strong, significant long-run relationship between stock prices and macroeconomic factors (interest rate, bonds price, foreign exchange rate, price-earning ratio, market capitalization, and consumer price index) during 1992-2001 in Thailand.

Similarly, Kimura, Kurozumi (2003) could not find any causal correlation between the money supply and development of the Japanese stock market. Positive correlation between share prices and trade balance, money supply, foreign exchange rates and industrial production was found by Chung and Shin (1999).

Gunasekarage, Pisedtasalasai and Power (2004) examined the influence of macroeconomic variables on stock market equity values in Sri Lanka, using the Colombo All Share price index to represent the stock market and (1) the money supply, (2) the treasury bill rate (as a measure of interest rates), (3) the consumer price index (as a measure of inflation), and (4) the exchange rate as macroeconomic variables. With monthly data for the 17-year period from January 1985 to December 2001 and using unit root tests, cointegration, and VECM, they examined both long-run and short-run relationships between the stock market index and the economic variables. The VECM analysis provided support for the argument that the lagged values of macroeconomic variables such as the consumer price index, the money supply and the Treasury bill rate have a significant influence on the stock market.

Seehalak (2004) examined the co-movements between the Stock Exchange of Thailand (SETI) and the Nikkei and Dow Jones indices over the period 1994- 2003 and used the Granger causality test to identify the long-run relationships between them. The findings suggested that the Nikkei index influences SET movements over the long run whereas the Dow Jones index influences SET movements in the short run.

Nishat and Shaheen studied the long-run equilibrium relationship between selected macroeconomic variables and the Pakistani (Karachi) Stock Exchange Index and found two long-term equilibrium relationships among these variables. Specifically, their results indicated that industrial production is the largest positive determinant of stock prices in Pakistan and that inflation is the largest negative determinant.

Maysami, Howe and Hamzah (2004) determined that although the long-term equilibrium relationships between the Singapore stock index and selected macroeconomic variables are not cointegrated, the Singapore stock index was sensitive to interest and exchange rates.

Bose and Coondoo (2004) suggest that there exists mild evidence of bi-directional causality between index returns and FII net inflows, they at the same time cautioned that it might be due to heightened foreign equity inflows caused by an upsurge in global equity markets.

Al-Sharkas (2004) utilized the vector error correction model (VECM) to determine the impact of selected macroeconomic variables (i.e., money supply, the interest rate and inflation) on the Amman Stock Exchange (ASE). The empirical results showed that stock prices and the selected macroeconomic variables have a long-term equilibrium relationship, and that money supply and the industrial production index each has a positive relationship with stock prices, whereas the consumer price index has a negative relationship with stock prices.

According to Oberuc (2004), the economic factors which, usually associated with stock prices movement and being considered greatly by researchers are dividend yield, industrial production, interest rate, term spread, default spread, inflation, exchange rates, money supply, GNP or GDP and previous stock returns, among others.

Sardar, Watanapalachaikul and Billington (2004) explored the long-run relationship between the Thai stock market and macroeconomic factors between 1992 and 2001 using the unit root test, augmented Dickey-Fuller test, augmented Engle-Granger test, and cointegration method. Their results showed that stock prices are positively affected by the interest rate, foreign exchange rate, price-earnings ratio, and market capitalization over the long run, whereas bond prices and the consumer price index (CPI) produced negative long-run effects.

Erdem et al. (2005) find mixed results for the Istanbul Exchange in Turkey; they find that interest rates and inflation volatility affect stock returns volatility whilst industrial output volatility does not affect stock returns.

When time series data from January, 1982 to December, 2002 on selected macroeconomic variables of major stock indices of United States and Singapore were used to examine the long-run equilibrium relationship between the two countries, Wong et al. (2005) discovered through a cointegration test that Singapore's stock prices generally display a long-run equilibrium relationship with interest rate and money supply but similar relationship does not exist in the US market.

Tri (2005) evaluated the impact of Gross Domestic Product (GDP) on Thai stock market movements on a quarterly basis from 1996 to 2004. Unit root tests, cointegration, the error correction mechanism (EC), and causality tests indicated

a long-run relationship between the variables, implying that GDP has an impact on Thai stock market movements. The causality test also confirmed that GDP is a Granger cause of Thai stock market movements with no reverse causality.

Chancharoenchai et al. (2005) investigated the relationship between domestic macroeconomic variables and stock excess returns to evaluate the effects of macroeconomic variables on excess returns and assess market efficiency in the Southeast Asian economies prior to the 1997 Asian crisis. Using a battery of tests, monthly stock excess returns are best specified by autoregressive (AR) conditional heteroskedasticity type models. While the null hypothesis of a martingale process is rejected, and some macroeconomic variables are identified that seem to have a certain predictive power for excess returns. Further, they report that Asian monetary authorities seem to have had a credibility problem in keeping inflation within a target range which has contributed to the 1997 crisis.

Basher and Sadorsky's (2006) exploration of the impact of oil price changes on the stock market returns of 21 emerging economies found strong evidence of the effect of oil prices being positive and statistically significant at the 10% level to stock market returns for most of the countries studied.

Gan, Lee, Yong and Zhang (2006) have examined the macroeconomics variables and stock market interaction: New Zealand Evidence. Their studied had a set of seven macroeconomic variables and used co-integration tests, johansen maximum likelihood and granger-causality tests. In addition, their paper also investigated the short run dynamic linkages between NZSE40 and macroeconomic variables using innovation accounting analyses. In general analysis it was found that the NZSE40 is consistently determined by the interest rate, money supply and real GDP but there is no evidence that the New Zealand Stock Index is a leading indicator for changes in macroeconomic variables.

Menike (2006) studied impact of macroeconomic variables on stock price in emerging Sri Lankan Stock Market. The data selected from 1991 to 2002 in which they used Multivariate regression on all variables for each stock. The study also finds out that there exists association between macroeconomic variables and stock price in the Colombo Stock Exchange. Exchange rate and inflation rate respond negatively on stock price in Colombo Stock Exchange.

Samy, Samir and Mohamed (2007) investigate the determinants of stock market development in the Middle-Eastern and North African region using Random effects specifications. The results shows that savings rate, financial intermediary, stock market liquidity and the stabilization variable are the important determinants of stock market development.

On the emerging market in Pakistan, Akmal (2007) applied the ARDL model to reveal the impact of inflation, industrial production, money supply, interest rates

and oil price on the development of the KSE index between 1971 and 2006. The same conclusion was reached by Husain, Mahmood (1999), in a co-integration test. They revealed strong correlation between share prices and money aggregates M1 and M2.

Causality between money supply and share prices on emerging markets was also investigated by Brahmairene and Jiranyakul (2007) who focused on the Thai stock market from 1992 to 2003 and found positive correlation between the money supply and share prices.

Ratanapakorn and Sharma (2007) examined the short-run and long run relationship between the US stock price index and macroeconomic variables using quarterly data for the period of 1975 to 1999. Employing Johansen's co-integration technique and vector error correction model (VECM) they found that the stock prices positively relates to industrial production, inflation, money supply, short term interest rate and also with the exchange rate, but, negatively related to long term interest rate. Their causality analysis revealed that every macroeconomic variable considered caused the stock price in the long run but not in the short-run.

Valadkhani and Chancharat (2008) investigated the existence of cointegration and causality between the stock market price indices of Thailand and its major trading partners (Australia, Hong Kong, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, the UK and the USA), using monthly data spanning December 1987 to December 2005. Based on the empirical results obtained from these two residual-based cointegration tests, potential long-run benefits exist from diversifying the investment portfolios internationally to reduce the associated systematic risks across countries. However, in the short-run, three unidirectional Granger causalities run from the stock returns of Hong Kong, the Philippines and the UK to those of Thailand, pair-wise. Furthermore, there are two unidirectional causalities running from the stock returns of Thailand to those of Indonesia and the USA. Empirical evidence was also found of bidirectional Granger causality, suggesting that the stock returns of Thailand and three of its neighbouring countries (Malaysia, Singapore and Taiwan) are interrelated.

The impact of changes to the money supply on share prices was also investigated by Shaoping (2008) who demonstrated very strong correlation between the money supply and share prices in the conditions of the Chinese market between 2005 and 2007. Similar results were reached by Yuanyuan, Donghui (2004) on the Chinese market.

Pimenta Junior & Hironobu Higuchi (2008) studied the relation of the causality of interest rate (Selic), Exchange rate (Ptax) and the inflation rate (IPCA) on the Ibovespa in the period from 1994 (after- Plano Real) to 2005. In this study, four econometric tests were used: unit root test (ADF), Granger causality test, analysis of the variance decomposition (VDC) and analysis of the Impulse and Response functions (IRF). The results showed that the Exchange rate was variable with a higher

level of causality in the Ibovespa, however, this result is statistically inexpressive; therefore, none of the variables selected presented causality relation to the index.

Using Johansen's multivariate cointegration test and Innovation accounting techniques, Adam and Twenenboah (2008) examined the role of macroeconomic variables on stock price movement in Ghana by means of Databank Stock Index, Treasury Bill Rate, Consumer Price Index and Exchange Rate as macroeconomic variables and conclude that there is cointegration between macroeconomic variables identified and stock prices in Ghana indicating a long run relationship. A cursory examination of foreign exchange rate and interest rate history in Ghana shows some considerable level of instability. Therefore, it would be interesting to explore the effect of its foreign exchange and interest rate changes on its stock market. Again, much work on the effect of the exchange rate and interest rate changes in the developing country like Ghana has not been done. The study is therefore intended to look at the effect of foreign exchange and interest rate changes on stock market returns in Ghana.

Abugri (2008) investigated the link between macroeconomic variables and the stock return for Argentina, Brazil, Chile, and Mexico using monthly dataset from January 1986 to August 2001. His estimated results showed that the MSCI world index and the U.S. T-bills were consistently significant for all the four markets he examined. Interest rates and exchange rates were significant three out of the four markets in explaining stock returns. However, it can be observed from his analysis that, the relationship between the macroeconomic variables and the stock return varied from country to country. For example from his analysis it is evident that, for Brazil, exchange rate and interest rate were found to be negative and significant while the IIP was positive and significantly influenced the stock return. For Mexico, the exchange rate was negative and significantly related to stock return but interest rates, money supply, IIP were insignificant. For Argentina, interest rate and money supply were negatively and significantly influenced on stock return but exchange rate and IIP were insignificant. But for Chile, IIP was positively and significantly influence stock return but exchange rate and money supply were insignificant. These results implies that the response of market return to shock in macroeconomic variables cannot be determine a priori, since it tends to vary from country to country.

Maku and Atanda(2009) examined the long-run and short-run macroeconomic shock effect on Nigerian capital market between 1984 to 2007. The macroeconomic variables used were inflation rate, exchange rate, money supply and real output as dependent variables. The results obtained using ADF and Error Correction Model showed that the share index is more responsive to selected variables and thus have significant impact on share index.

Araujo (2009) studied the economic sources underlying the co-movement of real stock returns in Latin America. Using structural VAR models, this study uses long-

run restrictions to identify three structural shocks: demand, supply, and portfolio shocks. The paper reports that portfolio shocks are important factors behind real stock returns for some countries only.

Tsouma (2009) investigated the dynamic interdependencies between stock returns and economic activity in developed and emerging markets. The main focus of this paper was on the existence, kind and strength of potential uni-directional and/or bi-directional relations running from stock returns to future economic activity and/or from economic activity to future stock returns. A bivariate VAR(12) model and Granger causality tests are applied to monthly data covering the January 1991-December 2006 period. This paper reports an existence of an empirical relationship, with forecasting ability, between stock returns and future economic activity. The results indicate significant differences between mature and emerging markets.

Aisyah, Noor and Fauziah(2009) examined the macroeconomic variables as money supply, interest rate, industrial production index and reserves on Malaysian Stock Index using VAR framework. The results proves that changes in Malaysian stock exchange have co-integrating relationship the changes in selected variables.

Ngoc (2009) examined the effect of macroeconomic indicator of interest rate on Vietnamese stock returns prices. This paper also shows the relationship between US macroeconomic indicators and Vietnamese stock prices. To evaluate they took monthly wise data from 2001 to 2008. This methodology analyzes the association among stock price and macroeconomic indicator. He found statistically important involvements between the domestic production sectors, money markets and stock price in Vietnam while US macroeconomic significantly influences Vietnamese stock prices.

Adamopoulos(2010) examined stock market and economic growth in Germany using Vector Error Correction Model(VECM). GDP and inflation variables were used as independent variables. Granger Causality showed results as unidirectional between stock market causality and selected variables.

It is argued that inflation and stock prices are inversely related (Jaffe and Mandelker, 1976; Bodie, 1976; Nelson, 1976; Fama and Schwert, 1977). This is contrary to a priori expectations by the Fisher hypothesis of a one-to-one increasing relationship between stock returns and inflation. Further empirical tests on the response of stock returns to inflation in the 1980s by Fama (1981), Gertler and Grinols (1982), and Solnik (1983), amongst others, also yielded similar results of a negative relationship.

According to the reverse causality hypothesis of Geske and Roll (1983), the reaction of stock markets to future economic activity is correlated with government revenue. In the event of a budget deficit and a decline of real activity, there is

increased domestic borrowing or increased supply of money through the central bank to balance the budget. The increase in domestic borrowing or issuance of money has inflationary effects that dampen real activity. In the end, stock market returns also fall due to a fall in real activity and the inflationary effect; hence the negative relationship between stock market returns and inflation. Empirical works however continue to produce mixed results (Gultekin, 1983; Solnik, 1983; Ely and Robinson, 1994; Groenewold et al., 1997; Caporale and Jung, 1997; Barnes et al., 1999; Boyd et al., 2001).

John and Owusu-Nantwi (2011) used Full Information Maximum Likelihood Procedure to find relationship between inflation rate, treasury bills and exchange and Ghana Stock exchange return. It was found that inflation had positive significant impact on GSE and treasury bills and exchange rate have significant negative impact.

Oskenbayev et al (2011) investigated the causal relationship between macroeconomic indicators, including the index of industrial production, inflation, exchange rate, oil prices volatility, volume of trade and long & short term interest rates, and the Kazakhstan Stock Exchange (KASE). They measured the long-term relationship using Autoregressive Distributed Lag model, while they used the Johansen cointegration test and Granger causality test for identifying the equilibrium relationship.

Asaolu and Ogunmuyiwa (2011) investigated the impact of macroeconomic variables on Average Share Price for Nigeria for the period of 1986 to 2007. The results from their causality test indicated that average share price does not Granger cause any of the nine macroeconomic variables in Nigeria in the sample period. Only exchange rate Granger causes average share price. However, the Johansen Co-integration test affirmed that a long run relationship exists between average share price and the macroeconomic variables.

Akbar et al. (2012) examined the relationship between the Karachi stock exchange index and macroeconomic variables for the period of January 1999 to June 2008. Employing a co-integration and VECM, they found that there is a long-run equilibrium relationship exists between the stock market index and the set of macroeconomic variables. Their results indicated that stock prices were positively related with money supply and short-term interest rates and negatively related with inflation and foreign exchange reserve.

Mgammal (2012) investigated the result of numerous variables (interest, exchange rate and inflation rate) on stock prices. The study applied on two gulf countries; United Arab Emirates (UAE) and Kingdom of Saudi Arabia (KSA) for the time from January 2008 to December 2009. They found that for short term, the exchange rates influence positively on stock market price index for United Arab Emirates while having no relationship between them for Kingdom Saudi Arabia.

The result of study in long term shared that exchange rate influence negatively on stock market price index for United Arab Emirates.

Attari & Safdar (2013) found the relationship between macroeconomic volatility and stock market volatility. They took data from December 1991 to august 2012 monthly wise. They used three variables; inflation rate, interest rate, and gross domestic Product and performed exponential generalized Autoregressive Conditional Heteroskedasticity technique. They concluded that stock prices affect the economics level of country.

3. LITERATURE REVIEW (ON INDIAN MARKET)

There have been several studies on this in Indian context. Sharma Kennedy (1977) and Sharma (1983) test the weak-form efficiency of the BSE. Both of these studies with the former covering the 1963-1973 period and the later encompassing the 1973-1971 period, conclude that Indian stocks generally conformed to random-walk behaviour in that successive period changes were independent. Poterba & Summers (1988), however, find evidence of mean reversion in Indian stock prices, suggesting a deviation from random-walk behaviour.

Darat and Mukherjee (1987) applied a Vector Auto Regression (VAR) model and found that a significant causal relationship exists between stock returns and selected macroeconomic variables of China, India, Brazil and Russia which are emerging economies of the world using oil price, exchange rate, and moving average lags values as explanatory variables employed MA (Moving Average) method with OLS (Ordinary Least Square) and found insignificant results which postulate inefficiency in market. Finally they concluded that in emerging economies the domestic factors influence more than external factors, i.e., exchange rate and oil prices.

The behavior of stock price (BSE) in relation to some key macro economic variables in India during the scam period 1992 was studied by Bhattacharya and Chakravarty (1994). Their dynamic forecasts indicate that the behavior of stock price is unrelated to key macro variables.

Abdalla and Murinde (1997) investigated the intersections between exchange rates and stock prices in the emerging financial markets of India, Korea, Pakistan and the Philippines. They found that results show unidirectional granger causality from exchange rates to stock prices in all the sample countries, except the Philippines, where they found that the stock price lead the exchange rate.

Raj Kumar and Bhartendu Singh (1998) observed that the joint impact of trading volume, rate of exchange and the rate of gold standard was highly significant on Sensex. The individual effect of rate of exchange and rate of gold standard on Sensex were also found highly significant but the individual effect of trading volume was not found significant.

Pethe and Karnik (2000) employed co-integration and error correction model to examine the inter-relationship between stock price and macroeconomic variables using monthly data from April 1992 to December 1997. Their analysis revealed that the state of economy and the prices on the stock market do not exhibit a long run relationship.

Bhattacharya and Mukherjee (2002) studied the nature of the causal relationship between stock prices and macro aggregates in India by using the methodology proposed by Toda and Yamamoto for the period of 1992-93 to 2000-2001. Their results show that there is no causal relationship between stock price and macro economic variables like money supply, national income and interest rate but there exists a two way causation between stock price and rate of inflation. According to them index of industrial production lead the stock price. They further investigated the causal linkage between stock prices and macroeconomic aggregates in the foreign sector in India like exchange rate, foreign exchange reserves and value of trade balance by applying the technique of co-integration and long run Granger non causality test developed by T&Y(1995). Their results suggested that there is no causal linkage between stock price and the three variables.

Seshaiah et al (2003) examined the impact of inflation and exchange rates on gold, silver and stock returns before and after liberalization. They found that over the longer period of time, positive real rate of return was being provided by stocks after liberalization, by gold in both periods, but in short run the real return of stocks was often negative. Negative real rate of return was being provided by silver in both the periods

Ray and Vani (2003) employed a VAR model and an artificial neural network (ANN) to examine the linkage between the stock market movements and real economic factors in the Indian stock market using the monthly data ranging from April 1994 to March 2003. The results revealed that, interest rate, industrial production, money supply, inflation rate and exchange rate have a significant influence on equity prices, while no significant results were discovered for fiscal deficit and foreign investment in explaining stock market movement.

Mukhopadhyay and Sarkar conducted a systematic analysis of the Indian stock market returns prior to and after market liberalization and the influence of macroeconomic factors on returns. Specifically for the post-liberalization period (since 1995), real economic activity, inflation, money supply growth, FDI, and the NASDAQ-index were significant in explaining variations in Indian stock return. Nominal exchange rate, while significant during the pre-liberalization period (1989-1995), was found to not be significant after liberalization.

Mishra (2004) examined the relationship between stock market and foreign exchange markets using Granger causality test and Vector Auto Regression technique. They used monthly data for stock return exchange rate, interest rate and

demand for money for the period 1992 to 2002. The study found that there exists a unidirectional causality between the exchange rate and interest rate and also between the exchange rate return and demand for money. The study also suggested that there is no Granger causality between the exchange rate return and stock return.

Sangeeta Chakravarty (2005) reexamined the relationship between stock price and some key macro economic variables in India for the period 1991-2005 using monthly time series data. She found unidirectional effect of IIP and inflation Granger causing stock prices and stock prices granger causing money supply. On the other hand there is no causal relation between stock price and exchange rate, and between gold price and stock price.

Vuyyuri (2005) investigated the cointegrating relationship and the causality between the financial and the real sectors of the Indian economy using monthly observations from 1992 through December 2002. The financial variables used were interest rates, inflation rate, exchange rate, stock return, and real sector was proxied by industrial productivity. Johansen (1988) multivariate cointegration test supported the long-run equilibrium relationship between the financial sector and the real sector, and the Granger test showed unidirectional Granger causality between the financial sector and real sector of the economy.

Robert and Gay (2008) investigated the effect of macroeconomic variable on stock market returns of Brazil, Russia, India and China using ARIMA model. The results showed no significant relation was found between either exchange rate or oil price on stock market index prices of either BRIC countries.

Paritosh Kumar (2008) validated the long term relationship of stock prices with exchange rate and inflation in Indian context.

Ahmed (2008) employed the Johansen's approach of co-integration and Toda - Yamamoto Granger causality test to investigate the relationship between stock prices and the macroeconomic variables using quarterly data for the period of March, 1995 to March 2007. The results indicated that there was an existence of a long-run relationship between stock price and FDI, money supply, index of industrial production. His study also revealed that movement in stock price caused movement in industrial production.

Kandir (2008) revealed the impact of interest rates and foreign exchange rates on share prices in Turkey and said that industrial production, money supply and oil price do not affect share yields on this market.

Samuel Imarhiagbe (2010) analyzed the impact of oil prices on stock prices of selected major oil producing and consuming countries with nominal exchange rate as additional determinant. Daily stock prices, oil prices, and exchange rates for six countries (Mexico, Russia, Saudi Arabia, India, China, and the US.) from January

26, 2000 to January 22, 2010, are modeled as a co integrated system in Vector Autoregressive analysis.

Singh (2010) examined causal relationships between macroeconomic variables and Indian stock markets. He considered three macroeconomic variables, IIP, WPI and exchange rates. He applied Granger causality test for this purpose. He found that IIP was the only macroeconomic variable causing changes in SENSEX.

Dash and Rao (2011) found that the APM did not have significant better explanatory power over the CAPM for Indian capital markets. Apart from the market factor, they found that interest rates (the MIBOR factor) have a significant role to play in influencing asset returns; but the market factor was found to be the most influential of the factors, more than twice as important as interest rates.

Pal and Mittal (2011) investigated the relationship between the Indian stock markets and macroeconomic variables using quarterly data for the period January 1995 to December 2008 with the Johansen's co-integration framework. Their analysis revealed that there was a long-run relationship exists between the stock market index and set of macroeconomic variables. The results also showed that inflation and exchange rate have a significant impact on BSE Sensex but interest rate and gross domestic saving (GDS) were insignificant.

Pramod Kumar Naik and Puja Padhi (2012) observed bidirectional causality between industrial production and stock prices, unidirectional causality from money supply to stock price, stock price to inflation and interest rates to stock prices. The authors conclude that macroeconomic variables and the stock market index are co-integrated and, hence, a long-run equilibrium relationship exists between them.

Narayan and Narayan (2012) investigated whether U.S. macroeconomic conditions (specifically, the exchange rate and the short-term interest rate) have effects on seven selected Asian stock markets – namely, China, India, the Philippines, Malaysia, Singapore, Thailand, and South Korea – using daily data for the period 2000–2010. They divided the sample into a pre-crisis period (pre-August 2007) and a crisis period (post-August 2007). They found that in the short run, the interest rate has a statistically insignificant effect on returns in all countries, except for the Philippines during the crisis period, and that depreciation has a statistically significant and negative effect on returns in all countries except China (regardless of the crisis). With respect to long-term relationships among the variables, although the authors found cointegration in the pre-crisis period for five of the seven countries (India, Malaysia, the Philippines, Singapore, and Thailand), they found no such relationship during the crisis period, implying that the financial crisis has actually weakened the link between stock prices and economic fundamentals.

Mohapatra and Panda (2012) correlated top ten rises and top ten falls of Sensex with corresponding net flows of FIIs and also tested the impact of other

macroeconomic factors along with FIIs affecting Sensex for a 10 year period and found that IIP and Exchange rate (INR/USD) have a higher influence than FIIs on the stock markets.

4. CONCLUSION

In the last few decades, the growing research interest in and importance of impact of macroeconomic variables on stock market has engendered a plethora of contributions on this topic. This paper has attempted to provide a picture of body of researches produced in the field of impact of economic variables on stock market during the period from 1960s to recent. Firstly we can conclude that most variable covered are inflation, exchange rate, IIP, GDP/GNP, money supply, interest rate, treasury bills. Also most researches are done on developed nations' or developing nations' stock indices like US, Great Britain, China, India, Singapore.

Thus research gap is found that still underdeveloped nations and developing nations like Bangladesh, Afghanistan, Nepal, African nations' etc. can be covered with variables like Imports, Silver, different commodities traded, Purchasing power parity, Total Reserves, Tax Reserves, Revenues, Expenditures which are least covered or not at all covered. Thus large number of researches can still be done on the same topic but different variables and on different stock markets.

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