



Macroeconomic Determinants of Share Prices: A Comparative Study of Banking and Insurance Sector in Nepal

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Abstract

The relationship between share price and various macroeconomic variables has remained inharmonious. The study analyzed, the selected macro-economic variables mainly risk free rate, consumer price index, dollar rate, remittance, international oil price, and money supply affecting banking and insurance sector share prices over the period of 8 years. The study supported the evidence that the selected determinants have little effect on NEPSE index and sub-index and revealed that the selected macroeconomic variables are independent series although there are indication of some causality relationship with some of the variables.

Key Words: *Risk free rate, Consumer price index, Dollar rate Remittance, International oil price, Money supply NEPSE index, Banking and insurance sub-index*

Introduction

The relation between movement of stock market and macroeconomic variables have been well documented in the literatures over several decades. Studies have shown and argued in the line that stock prices are determined by some fundamental macroeconomic variables, where such variables could influence investments decisions and motivated researchers to investigate the relation between stock market prices and macroeconomic variables. The basic feature of capital market is to encourage its investor by setting stock price and increase the liquidity of financial instrument, eventually contribute to economic growth on long term. The stock market is known as the equity market and is one of the important areas of a market economy as it provides access to capital to companies, ownership in the company for primary investors and the potential of gains based on the firm's future performance for secondary investors (Osoro, 2013).

The main objective behind the establishment of stock market is to make an easy process for savers and borrowers, as it takes savings from different groups and provide them a stand to change these savings into successful investments. The key function of the stock market is to provide an exchange in which buyers and sellers interact for the purpose of trading in shares and other securities issued by publicly traded companies (Cherif & Gazdar, 2010). It works as such a stand where many variables collectively move together



to make the economy of any country well groomed. The share price is one of the most important indicators available to the investors for their decision to invest in or not a particular share (Khan & Gill, 2012). The macroeconomic factors have important concerns with stocks traded in the stock market and these factors make investors to choose the stock because investors are interested to know about the factors affecting the working of stock to manage their portfolios. Abrupt variations and unusual movements of macroeconomic variables cause the stock returns to fluctuate due to uncertainty of future gains.

The stock market is primarily the place where these companies get listed to issue the shares and raise the fund. In case of an already listed public company, they issue more shares to the market for collecting more funds for business expansion. For the companies which are going public for the first time, they need to start with the Initial Public Offering or the IPO. In both the cases these companies have to go through the stock market. This is the primary function of the stock exchange and thus they play the most important role of supporting the growth of the industry and commerce in the country. That is the reason that a rising stock market is the sign of a developing industrial sector and a growing economy of the country. The secondary function of the stock market is that the market plays the role of a common platform for the buyers and sellers of these stocks that are listed at the stock market.

There are many macroeconomic variables that can affect stock market index and sub-index of Nepal such as risk free rate, consumer price index, dollar rate, worker remittance, gross domestic product, gold price, foreign direct investment, trade deficit/surplus, international oil price, and money supply etc. Most important and crucial economic variables that may affect the developing countries including Nepal are inflation, discount rate, GDP per capital and gross domestic savings. Massive number of studies have revealed the relationship of these variables with stock market index but this research will focus to trace down the effect of these variables specifically on KSE-100 index. The relationship between macroeconomic variables and stock market index has always been of immense attraction for finance practitioners since many years. Studies show that inflation and interest rates have negative relationship with stock market index whereas GDP growth has a positive relation with stock market index (Sohail and Hussain, 2011).

Banking and insurance sector both growing trends. In current scenario, insurance sector is the most charmed scrip of investors. After earth earthquake of 2015, insurance sector shares priced increased supper natural just 3-4 years period insurance index increase by 498.4360% is the main reasons behind the drastic progress in insurance sectors as most of the people are acknowledge with its importance. If we look at the report as published by the insurance sectors, most of them have reported outstanding growth rate. Banking sector leading sector and largest trading sector around 35% of share trading each year. Banking sector annual return approximately above 30%. Other sector are currently not actively traded in market.

Literature Review

Studies on stock market and its relation with macroeconomic variable have suggested significant relationship between stock price and exchange rate, inflation rate, interest rate, gold price and remittance. Some of the literature strongly support these



variables highly correlated to share price. The results have indicated that there exists a high positive correlation between Stock market indices and inflation, Index of Industrial production, Money Supply, gold price, silver price and oil price (Patel, 2012). Eita (2011) conducted a study in the macroeconomic determinants of stock market prices in Namibia. The investigation was conducted using a VECM econometric methodology and revealed that Namibian stock market prices are chiefly determined by economic activity, interest rates, inflation, money supply and exchange rates. An increase in economic activity and the money supply increases stock market prices, while increases in inflation and interest rates decrease stock prices. The results suggest that equities are not a hedge against inflation in Namibia, and contradict monetary policy generally depresses stock prices. Increasing economic activity promotes stock market price development.

A researcher conducted macroeconomic variables and stock market interaction in New Zealand and examined the relationships between the New Zealand Stock Index and a set of seven macroeconomic variables from January 1990 to January 2003 using integration tests, Johansen multivariate co-integration test. Specifically, Johansen Maximum Likelihood and Granger-causality tests to determine whether the New Zealand Stock Index is a leading indicator for macroeconomic variables. In addition, this research also investigated the short run dynamic linkages between NZSE40 and macroeconomic variables using innovation accounting analyses. In general, the NZSE40 is consistently determined by the interest rate, money supply and real GDP and there is no evidence that the New Zealand Stock Index is a leading indicator for changes in macro-economic variables (Lee, 2006).

In a study conducted in India the study investigated the relationships between the Indian stock market index (BSE Sensex) and five macroeconomic variables, namely, industrial production index, wholesale price index, money supply, treasury bills rates and exchange rates over the period 1994:04–2011:06. Johansen's co-integration and vector error correction model were applied to explore the long-run equilibrium relationship between stock market index and macroeconomic variables. The analysis revealed that macroeconomic variables and the stock market index were co-integrated and, hence, a long-run equilibrium relationship exists between them. It was observed that the stock prices positively related to the money supply and industrial production but negatively related to inflation. The exchange rate and the short-term interest rate are found to be insignificant in determining stock prices. In the Granger causality sense, macroeconomic variable causes the stock prices in the long-run but not in the short-run. There is bidirectional causality exists between industrial production and stock prices whereas, unidirectional causality from money supply to stock price, stock price to inflation and interest rates to stock prices are found (Pramod Kumar & Puja, 2012).

In another study conducted in Singapore examined the long-term equilibrium relationships between selected macroeconomic variables and the Singapore stock market index (STI), as well as with various Singapore Exchange Sector indices—the finance index, the property index, and the hotel index. The study concluded that the Singapore's stock market and the property index form cointegrating relationship with changes in the short and long-term interest rates, industrial production, price levels, exchange rate and money supply. Singapore stock market and the SES All-S Equities Property Index formed

significant relationships with all macroeconomic variables identified, while the SES All-S Equities Finance Index and SES All-S Equities Hotel Index form significant relationships only with selected variables (Maysami et al., 2005).

Another researcher used Ordinary Least Square (OLS) method and find out the impact of macro-economic factors on the returns of selected sectors. Results of OLS showed that the impact of macroeconomic factors on the returns of sectors is significant except Jute. The nature of jute is inelastic and inelastic products are usually least sensitive to change in macroeconomic conditions in economy (Saeed et al., 2012). Pakistani researcher used GARCH models and vector auto regressive models find out the Stock Market Volatility and Macroeconomic Factor Volatility this are the findings,

- Money supply have no direct effect with movements in stock market.
- Central bank of any state does not have relationship with movement of stock indices.
- Real interest rate does not have relationship with volatility in stock returns.
- Consumer price index proved to have significant relationship with volatility of stock returns.
- Exports have significant relationship at some level with variations of stock indices and influence the stock returns.
- Industrial production index also has relationship with variations in stock returns.

It is inferred that volatility in different macroeconomic fundamentals exists and some of them also relationship with variations of stock returns (Ahmad & Ramzan, 2016). Oyama (1997) has used inflation rate, exchange rate, interest rate, commodity price index, US stock market index to see their impact on stock price on Zimbabwe stock market. Using Dividend Discount Module, error correlation module and multi-factor return-generating module used analyzed impact on stock price. The shows that Interest rate negative relationship, positive relationship between inflation rate, Zimbabwe stock dependent heavily on external trade, with the result that their stock prices very likely to be sensitive to change in exchange in exchange rates. Commodity price index have a significant impact.

In this study, a multiple regression model was employed to test for the effects of macroeconomic factors on stock price for the period Jan 2008 to Jan 2009. Macroeconomic variables used in this study are, change in exchange rate, foreign exchange reserve, inflation rate and gold price. In the regression models, stock prices were used as dependent variables, while the macroeconomic variables are used as independent variables. Empirical result revealed that exchange rate, and gold price to affect the entire BSE Stock price. There was 88.9% correlation of exchange rate with stock price and gold price had 90.2% correlation with stock price. Independent variables except inflation rate and foreign exchange reserve had a significant relation with stock price. Exchange rate and gold price seem to affect the entire stock price while inflation rate was significant for only three of the twelve portfolios. On the other hand, inflation rate and gold price do not appear to have any significant effect on stock returns. It means that inflation rate and foreign exchange reserve don't influence the stock price (Sharma & Mahendru, 2010). Phuyal (2016) investigated using Johansen's cointegration method, whether a long-term association of selected macroeconomic variables existed with stock prices in the emerging market like Nepali stock market. The results indicated that the Nepali stock market had a long run

equilibrium relationship with a set of macroeconomic variables, like inflation rate, interest rate and remittance flow with the short-term disequilibrium corrected by 1.79% on monthly basis. On Nepalese monthly data from January 2003 to December 2012 were used with a set of six macroeconomic variables and stock market return.

Bhattarai and Joshi (2009) examined the Dynamic Relationship among the Stock Market of Nepal. For this analysis, Multivariate cointegration and Vector Error Correction Module to have estimates. The analysis demonstrated results suggest unidirectional short-run (positive) causal relationship running from consumer price index (CPI) to stock index but reverse causality in the long run (from stock index to CPI), supporting the widely-held view that stock returns are a hedge against inflation. The multivariate results also confirmed absence of long-run causality but supported positive and unidirectional relationship flowing from money supply to stock index in the short run. Nevertheless, the multivariate results revealed longrun causality running from stock index to Treasury bill rate but no short-run linkage.

Shrestha and Subedi (2014) traced out the major Determinants of Stock Market Performance in Nepal. They used the time series data from mid-August 2000 to mid-July 2014 in their analysis. The study used OLS model to discover the stock market performance. Researcher found to respond positively to inflation and broad money growth, and negatively to interest rate.

Objectives of the Study

Objectives of the study are to determine and ascertain correlation and causal relationship between Nepal Stock Exchange (NEPSE) index and macroeconomic variables through regression analysis. It is intended:

- To ascertain the dependency of NEPSE index on selected macroeconomic variables.
- To calculate relationship and causality between selected macroeconomic variables and NEPSE index, banking sub-index, and insurance sub-index.
- To trace the strength of relationship of these macroeconomic variables with banking sub-index and insurance sub-index.

Research Methodology

This section explains the methods to be used to collect secondary data necessary for the study. This section outlined the research method used in order to achieve the objectives outlined in Chapter One. The chapter has discussed the use of research design, the targeted population and data collection methods. Data analysis has also been discussed in detail with the researcher explaining the model and statistical tools that will be used to analyse the data.

Variables Used: The various variables that have been identified in the literature as important determinants of stock Index are taken for analysis in this study. The first one is the risk-free rate (interest rate) used to examine the NEPSE index and sub-index. Pramod Kumar & Pujja (2012), Lee (2006), Ahmad & Ramzan (2016), Oyama (1997), Adam & Tweneboah (2008) Phuyal, (2016). Similarly, Dollar rate (exchange rate) CPI, Remittance

and Money supply as one of the independent variables to discuss about the stock performance was used by many scholars like Phuyal, (2016), Ahmad & Ramzan (2016), Pramod Kumar & Puja (2012). Oil price is widely used Sadorsky (2003).

Nature and Sources of Data: This study is based on secondary data only. This study has covered 8-year time span-FYs 2009/10 to 2016/17 start from august. NEPSE index, banking sub-index, and insurance sub-index are abstracted from the closing date end of the months. The total number of observations is 96 months of all variables. SEBO/N and NEPSE Ltd are the major sources of required data. Required information and data were extracted from the annual reports of SEBON/N and downloaded from the official website of NEPSE Ltd. In addition, some of the information and data were culled from the reports of previous studies.

Regression Equation Model I

$$SP = B_0 + B_1 RF + B_2 CPI + B_3 DR + B_4 RM + B_5 IOP + B_6 M_2 + U \text{ ----- (i)}$$

Banking sub-index calculated

$$SP_{\text{bank}} = B_0 + B_1 RF + B_2 CPI + B_3 DR + B_4 RM + B_5 IOP + B_6 M_2 + U \text{ ----- (ii)}$$

Insurance sub-index calculated

$$SP_{\text{insurance}} = B_0 + B_1 RF + B_2 CPI + B_3 DR + B_4 RM + B_5 IOP + B_6 M_2 + U \text{ ----- (iii)}$$

Where,

SP = Stock Price (NEPSE index)

SP bank = Stock Price (Banking sub-index)

SP insurance = Stock Price (Insurance sub-index)

RF = Risk free rate

CPI= Consumer Price Index

DR = Dollar Rate

RM = Remittance

IOP = International Oil Price

M₂ = Money Supply

e= Error $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are regression coefficients that refer to the amount with which a dependent variable increases when one of these independent variable increase while others remain constant.

Hypothesis of the Study:

Study is based on the following hypothesis: Alternative hypothesis (H): Risk free rate, consumer price index, dollar rate, remittance, international oil price and money supply have significant impact on NEPSE index, banking sub-index and insurance sub-index of Nepal.

Presentation and Data Analysis

The result of regression analysis obtained by using SPSS revealed that model is significant as the p-value (0.000a) of the model is less than the pre decided level of

significance (0.05) therefore, we accept the two alternative hypothesis international oil price and money supply means selected explanatory variables have significant impact on NEPSE index and sub-index.

Table 1.

Coefficient of Regression of NEPSE index

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 142.055 | 323.594 | | .439 | .662 |
| RF | -2.297 | 8.887 | -.014 | -.258 | .797 |
| CPI | 1.016 | 7.727 | .005 | .131 | .896 |
| DR | -2.061 | 4.785 | -.060 | -.431 | .668 |
| RM | .000 | .003 | .009 | .088 | .930 |
| IOP | -3.218 | .828 | -.196 | -3.886 | .000 |
| M2 | .003 | .000 | .845 | 7.144 | .000 |

a. Dependent Variable: NEPSE Index

The Table shows that money supply, and international oil price are significant to predict the dependent variable, NEPSE index. This is because the p-value indicated by the last column of the above table (Sig.) is less than alpha value 0.05 for these independent variables. The other variables risk free rate, consumer price index, dollar rate, and remittance have p-value of .797, .896, .668, and .930 respectively. These p-values are higher than the alpha value of 0.05 implying that these variables are not significant to predict the dependent variable.

Table 2.

Coefficient of regression comparison between banking and insurance sub index

| Variables | Banking Sub-Index | | | Insurance Sub-Index | | |
|-----------|-------------------|--------|------|---------------------|--------|------|
| | Beta | t | Sig | Beta | t | Sig |
| Constant | - | -.258 | .776 | - | .229 | .819 |
| RF | .021 | .358 | .721 | -.041 | -.734 | .465 |
| CPI | .009 | .229 | .820 | -.017 | -.461 | .646 |
| DR | .037 | .253 | .801 | -.267 | -1.874 | .064 |
| RM | -.045 | -.401 | .689 | .119 | 1.105 | .272 |
| IOP | -.193 | -3.646 | .000 | -.113 | -2.212 | .029 |
| M2 | .822 | 6.618 | .000 | .973 | 8.104 | .000 |

Table 2, shows that IOP, and M2 are significant to predict the dependent variables. The other variables RF, CPI, DR, and RM have significant value is more than alpha value (0.05) these variables are not significant to predict dependent variables.

As per the analysis risk free rate positive influence on banking sub-index and negative influence on insurance sub-index. When other variables are held constant, every one percent increase in risk free rate would lead to increase in banking sub-index by 0.021 and decrease in insurance sub-index by 0.041. It indicates that, risk free rate increase banking sub-index is also increased but insurance sub index is decreased. In this situation investor buy the banking share and vice versa.

Also, as per the analysis presented in the table, consumer price index positive influencing on sub-banking index and negative influence on insurance sub index. When other variables are held constant, every one percent increase in CPI will lead to increase in banking sub-index by 0.09 and decrease in insurance sub-index by 0.017. It indicates that, CPI increase banking sub-index is also increased but insurance sub index is decreased. In this situation investor buy the banking share and vice versa.

Dollar rate positive influence on banking sub-index and negative influence on insurance sub-index. When other variables are held constant, every one unit increase in dollar rate will lead to increase in banking sub-index by 0.037 and decrease in insurance sub-index by 0.267. It indicates that, dollar rate increase banking sub-index is also increased but insurance sub index is decreased. In this situation banking share is fruitful for investor and vice versa.

Remittance negative influence on banking sub-index and positive influencing on insurance sub-index. When other variables are held constant, every one million Rupees will lead to decrease in banking sub-index by 0.045 and increase insurance sub-index by 0.119. It indicates that, Remittance increase banking sub-index is decreased and insurance sub-index is increased. In this situation insurance shares is fruitful for investor and vice versa.

International oil price negative influence on both sector, beta value of banking sub-index is -0.193 and insurance sub-index is -0.113. It indicates International oil price increase banking and insurance sub-index decrease. In this situation 'no investment policy' is the best and vice versa.

Money supply positive influencing on both sector, beta value of banking sub-index is 0.822 and insurance sub-index is 0.973. It indicates money supply increase banking and insurance sub index increase. In this situation both of the option is good, insurance company is more fruitful than banking share, because beta value is higher than banking index.

Conclusion

The present study is conducted to evaluate the Macroeconomic determinants of share price: A comparative study of banking and insurance share prices. The research totally based on secondary data which were collected from NEPSE publication, NRB publication, and previous published research study for the period of August 2009 to July 2017. The results of the empirical analysis were consistent and some of the variables findings contradict, with most of the findings in the literature review and support the evidence that the selected determinants have little effect on NEPSE index and sub-index. The study revealed that the selected macroeconomic variables were independent series although there was indication of some causality relationship from some of the variables



such as Money supply, consumer price index, and dollar rate. Share prices were influenced by numerous factors so that predictions using only a number of select variables may give incorrect results. Many researchers have striven hard to build models which incorporate a diverse array of variables to predict the share prices but have not been successful in having one such model.

This study concludes that risk free rate, consumer price index, dollar rate, and worker remittance is inconsiderable indicator to predict the NEPSE index and sub-index. Money supply and international oil price is most effective indicator for predict NEPSE index and sub-index. Money supply shall have strong positive impact on stock market if money supply increase, NEPSE index and sub-index is also increased and vice-versa but international oil price shall have strong negative impact on stock market if international oil price increase, NEPSE index and sub-index is decreased and vice-versa. The comparative study show If, RF increase buy banking shares, CPI increase buy banking shares, DR increase buy banking shares, RM increase buy insurance shares, IOP decrease buy insurance shares, and M2 increase insurance shares and vice-versa except IOP and M2.

Implications and Future Research Directions

The research on Macroeconomic determinants of stock price has made partial contribution for organizations like SEBON, NEPSE, Nepal Rastra Bank, Ministry of Finance and Government of Nepal. Besides the institutions investors, speculators and other researchers could also get insights from this study.

Recommendation for future research

The R-Square values is more than 90 percent on NEPSE index and sub-index it indicated other unexplored factors that might influence share price. This study focuses on the relationship between macro-economic variables and NEPSE index, banking sub-index and insurance sub-index. In future researcher could use other sub-index and other macro-economic indicators, which could be considered for further studies like political conditions, regulatory news, and introduction of new policies. It has been seen in Nepal that positive political news like elections, formation of new government lead to increase in NEPSE index in Nepal. This research centered on service sector for a last eight-year period. Stock markets are very complex, finding a pattern in share price is quite difficult when using limited data and single model. Due to the seasonality and cyclic nature of stock markets the time period selected may have affected the final results. This study focused on the linear relationships and could be extended to include nonlinear relationships between the variables. Also, other multivariate statistical forecasting models could be employed to verify the results.

Recommendations for policy makers

Ministry of Finance and Nepal Rastra bank are the main policy makers of this country. Nepal Rastra Bank makes the monetary policies whereas Ministry of Finance makes Fiscal policy. The findings of the research will help these institutions to understand which macroeconomic indicators are significantly affecting and which sector stock price

so that policies can be made to change the macroeconomic indicators in such a way that it will lead to a better performance of NEPSE.

The study showed that international oil price had a significant and negative relationship with NEPSE index and NEPSE sub-index. So this means that Fiscal policy makers should increase oil price by either adding Tax, VAT or other duties so that investors will invest in the share market of Nepal instead of oil which are being imported by the country.

Money supply and NESPE index and sub-index had a positive and significant relationship. So, government should try to maintain enough money supply in the market so that public will invest in the stock market.

Recommendation for investors

This research could be very helpful for speculators, investors and professional portfolio managers to make investment decisions. The results of this study show that international oil price and NEPSE index and sub-index exist a significant negative relationship. Money supply and NEPSE index and sub-index exist a significant positive relationship.

| Variables | Banking sub-index | | Insurance sub-index | |
|-----------|-------------------|----------|---------------------|----------|
| | Buy | Sell | Buy | Sell |
| RF | Increase | Decrease | Decrease | Increase |
| CPI | Increase | Decrease | Decrease | Increase |
| DR | Increase | Decrease | Decrease | Increase |
| RM | Decrease | Increase | Increase | Decrease |
| IOP | Decrease | Increase | Decrease | Increase |
| M2 | Increase | Decrease | Increase | Decrease |

So, the potential investors could use this knowledge without ignoring the external factors and other macro-economic variables. Table shows that macroeconomic variables RF, CPI & DR are increase banking and insurance sub index both of them are increase but banking sub-index increase is more than insurance sub-index. In this situation investor buy banking share and vice versa. Remittance and international oil price is goes down investor buy banking sector shares. Money supply is increasing buy insurance sector shares and vice-versa.



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