



Macroeconomic Determinants of Stock Market Prices in Nepal

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Abstract

Background: Stock market plays a crucial role in the financial system of a country. It can be viewed as a channel through which resources are properly channeled. It enables the governments and industries to raise long-term capital for financing new projects. The stock markets of developing economies are likely to be sensitive to various macro-economic factors such as GDP, imports, exports, exchange rates etc. When there is high demand on financial products, as a constituent of financial market, and ultimately stock market needs to develop. Many factors can be a signal to stock market participants to expect a higher or lower return when investing in stock and one of these factors are macroeconomic variables. Thus, macro-economic variables tend to affect stock market developments.

Objective: This study examines the linkage between stock market prices (NEPSE index) and five macro-economic variables, namely; real GDP, broad money supply, interest rate, inflation and exchange rate using an autoregressive distributed lag (ARDL) model to explain the behavior of the Nepal Stock Exchange Index.

Methods: The study uses error correction model (ECM) which is delivered from ARDL model through simple linear transformation to integrate short run adjustments with long run equilibrium without losing long run information. The analysis has been done by using 25 years' annual data from 1994 to 2019.

Findings: The result indicates that the fluctuation of NEPSE Index in long run is strongly associated with broad money supply, interest rate, inflation, and exchange rate. The GDP, money supply and exchange rate can positively define in short run while only money supply holds positive relationship in long run.

Conclusion: Though Nepalese stock market is not yet well developed and matured, broad money supply, interest rate, inflation and exchange rate are major factors affecting stock market price of Nepal. Therefore, policies and strategies should be made and directed taking these into considerations.

Implication: The findings of research can be helpful to understand the behavior of Nepalese stock market and develop policies for market stabilization.

Keywords: NEPSE; stock prices; macroeconomic variables; GDP

Paper Type: Research Paper

JEL Classification: E₂₂, E₄₄, C₃₂

Introduction

Financial institutions contribute to the national economy by accumulating the capital funds to meet the financial needs of different productive and business sectors (Gupta, 1982). Functionally, financial markets are broadly classified into money markets and capital markets. Transactions in short-term debt instruments or marketable securities are done in money market whereas long-term securities (bond and stocks) are traded in the capital market (Kovács & Kajtor-Wieland, 2017). According to Ehrmann et al. (2011) money market is the financial market for short-term borrowing and lending and provides short term liquid funding for the financial system whereas, Capital market is the financial market for long-term borrowing and lending and provides long term liquid funding for the financial system government bonds, institutional bonds and stocks. Adam et al. (2016) explained that stock market is a major component of the securities market which directly mobilizes funds to finance productive projects by issuing shares in the market. Stock market is a very important economic institution that plays a crucial role in the economy by channeling investment where it is needed and can be put to the best use (Libermen & Fergusson, 1998). So, the stock market functions as the channel through which the public savings are channelized to industrial and business enterprises. In another words, stock markets are essential for economic growth as they insure the flow of resources to the most productive investment opportunities.

Securities markets can be divided into two parts: the primary and the secondary markets. In the primary market the securities are sold at the time of their initial issuance. On the other hand, the secondary market can be viewed as a 'used' securities market. It is the capital market where previously issued securities have been traded through stock exchange. In this regard, stock market is a major component of securities market (Boehme & Colak, 2012). A stock market is the center of a network of transactions where buyers and sellers of securities meet at a specified price (Bologa & Cavallo, 2002). It plays a key role in the mobilization of capital in emerging and developed countries, leading to the growth of industry and commerce, as a consequence of liberalized and globalized policies adopted by most emerging and developed governments. Many factors can be a signal to stock market participants to expect a higher or lower return when investing in stock market and one of these factors are macroeconomic variables (Talla, 2013).

In Nepal, introduction of the Company Act, 1964, the first issuance of government bond in 1964 and the establishment of the Securities Exchange Center Ltd. in 1976 were significant developments relating to capital markets. The Securities Exchange Center was established with an objective of facilitating and promoting the growth of capital markets. Before conversion into stock exchange it was the only capital markets institution undertaking the job of brokering, underwriting, managing public issue, market making for government bonds and other financial services. Nepal Government, under a program initiated to reform capital markets converted the Securities Exchange Center into Nepal Stock Exchange (NEPSE) in 1993. NEPSE was established under the Company Act, 1964 and had been operating under the Securities Exchange Act, 1983. The basic objective of NEPSE is to impart free marketabil-

ity and liquidity to the government and corporate securities by facilitating transactions in its trading floor through members, market intermediaries, such as brokers, market makers etc. The NEPSE opened its trading floor on 13th January 1994. The Government of Nepal, Nepal Rastra Bank, Nepal Industrial Development Corporation and members are the shareholders of NEPSE (NEPSE, 2018).

Nepal stock market is not yet fully matured, however, it is in emerging state (Thapa, 2019). Buyers prefer to buy primary stock and take stock dividend rather than cash dividend. The size of Nepalese securities market has increased in Q3 of FY 2018/19 as compared to corresponding period of last FY 2017/18. Fund mobilization through primary market increased significantly during the review period due to the increased in the volume of IPOs and debenture and mutual fund issue. However, right offerings decreased in the review period. Comparing with the Q2 of current FY 2018/19, primary market scenario showed mixed growth in Q3 of FY 2018/19. It is attributed to the decreasing debenture issue and absence of FPOs during the review period. According to review of first nine months of current FY, IPOs volume and right offerings decreased significantly as compared to the corresponding period of last FY. Some indicators of secondary market, except number of listed companies and securities, float market capitalization traced the downtrend in Q3 of FY 2018/19 as compared to Q3 of last FY. During the review period (Q3 of FY 2018/19), most of the indicators like quarterly turnover of securities, NEPSE index, market capitalization, listed companies and securities reversed to uptrend as compared to Q2 of same fiscal year. The positive momentum in secondary market during the review period is assumed to be driven by the regulators' initiation to implement the policy suggestion given by committee that is formed to trace the problem of money and capital market and investor being optimistic on upcoming fiscal policy of Nepal Government etc.

The change in market price of stock in course of time is a natural phenomenon that makes in fact gain or loss to the investors in secondary market. There are many macroeconomic factors that determine the market price of stocks. But, there are controversies among investors about the factors that affect price of stocks as well as financial performance of the company. Generally, Nepalese investors are investing on stocks without proper information of macroeconomic factors. So, one of the main causes of fluctuation of stock price in Nepal is that market rumour which becomes major analytical tool for most of the Nepalese investors. No doubt, the number of investors in Nepalese stock market is increasing day by day. Most of the investors are investing on the company which has no return from their investment. Without any productivity of the companies, market price of the share is increasing day by day. Beside, stock price is also determined by demand and supply. Hence, this study tries to identify the degree of affection of those determinants on stock prices in secondary market. More specifically, this study tries to find out the answer of following research questions; i) What is the trend of stock market in Nepal? ii) What are major macroeconomic factors that determine the stock market in Nepal? iii) What is the role of major macroeconomic variables (real GDP, broad money supply, inflation, interest rate and exchange rate) on the stock market prices in Nepal?

The major objective of the study is to analyze the macroeconomic determinants of stock market price in Nepal along with the trend of the stock market development in Nepal. It also seeks to examine the relationship between the macroeconomic variables and the stock market prices. The Nepalese stock market is still in its initial phase. There is no long history of stock market in Nepal. Many practices, strategy and policies have to be done in this sector. Many investors are investing without knowing proper and enough information of company and its performance, financial status, and return. Although, many new investors are attracting for investment in bullish market, they have no any symmetrical information about the major macroeconomic variables which determines the stock market prices. Some investors think that the NEPSE Index would go on and on with an exponential rate and it would not come back to previous periods. Besides, it helps to understanding the relationship between stock market prices and major macroeconomic variables. It can further help policy makers, investors to keep eye on the stock market.

The remaining part of the paper is organized in four sections. Section 2 reviews the literature relevant to the present study. Materials and methods are discussed in Section 3 and Section 4 discusses the results of this study and, finally, Section 5 presents the concluding remarks.

Review of Literature

Stock Market and Its Impact

The relationship between stock prices and economic variables emerges with the arbitrage pricing theory (APT) which deals with stock market returns and economic variables (Ross, 1976).

The Capital Asset Pricing Model (CAPM) describes the relationship between systematic risk and expected return for assets, particularly stocks. It is widely used throughout finance for the pricing of risky securities, generating expected returns for assets given the risk of those assets and calculating costs of capital. The CAPM is an idealized portrayal of how financial markets price securities and thereby determine expected returns on capital investments (Sharpe, 1970).

Bachelier (1900) that discussed the use of Brownian motion to evaluate stock options is historically the first paper to use advanced mathematics in the study of finance. The researcher concluded that market and security price did not begin with the development of a theory of price formation which was then subjected to empirical test. Its impetus for the development of the theory came from the accumulation of evidence in the middle that the behavior of common stock and other speculation of prices could be well approximated by a random walk.

Hossein, Ahmad and Lai (2011) concluded that there is both long term and short term linkages between macroeconomic variables and stock market index in China and India. In the long run, the impact of increases in crude oil price in China is positive and, in India, it is negative. Impact of money supply in Indian stock market is negative, but, in China, it is positive. The effect of industrial production, negative in China and positive in India. The effect

of increases in inflation on these stock indices is positive in both countries. In the short run, the contemporaneous effect of crude oil price is positive in India. This effect is negative and insignificant in China. The contemporaneous impact of money supply on current Chinese stock market indices is positive but for India is negative. However, all these impacts are insignificant. On the other hand, the contemporaneous effect of inflation on current Chinese stock index (SSE) is positive and significant. Eita (2012) investigated macroeconomic determinants of stock market price in Namibia using a vector error correction model (VECM) econometric model and revealed that Namibian stock market prices are highly determined by economic activity, interest rates, inflation, money supply and exchange rates. The researcher used quarterly data covering the period 1998 to 2009. The researcher found that if stock market prices move away from equilibrium, money supply and interest rates would not adjust quickly to correct the disequilibrium and bring the system back to equilibrium. The exchange rate, income and inflation have positive relation with stock price. Soti (2015) observed in the relationship between Nepalese stock market and macroeconomic variables taking the monthly data from January 2005 to December 2014. The researcher used ADF and ARDL model. This study concludes that there is a long run relationship between NEPSE index and Consumer Price Index (CPI), money supply and interest rate variables despite some short term fluctuations.

Pradhan and KC (2010) concluded that Nepalese Stock Market might not be termed as "weakly efficient" in pricing shares where market efficiency is defined as all historical information is reflected in security price. The main factors affecting share prices perceived by the respondents were dividends, retained earnings, bonds share and right issue. The results indicated that the random walk hypothesis is true for less frequently traded stocks and is consistent with the prices of less frequently traded stocks in the context of Nepalese stock market.

Paudel (2008) concluded that NEPSE index showed a steady increase in the later month of the study period and the better performance of NEPSE. Stock market performance was less in a stable position in the capital market overall in the study period. KC (2004) suggested that financial development does not matter and stock market do spur economic growth. Unfortunately in Nepal, despite a history of about half a decade, financial sector despite, many problems have developed significantly. However, most of the developments were confined to the banking sectors. Stock market has virtually remained stalled because of this priority in the government's financial reform policies. Various measures of stocks market development indicate that the stock market in Nepal is underdeveloped and has failed to show impact on the overall national economy. Small market size has made it vulnerable to manipulation and price rigging. Low turnover ratio and value-traded ratio to volatility, and high concentration ratio indicate that the stock market in Nepal is liquid and risky. Investors tend to avoid stock market because they do not have option to it since stock market is less reliable source of raising funds for them. Due to this, financial system of Nepal has remained bank dominated.

Shrestha and Subedi (2014) examined the determinants of the stock market performance in Nepal using monthly data for the period of mid-August 2000 to mid-July 2014. Their suggestion was that in Nepal, share investors seem to take equity as a hedge against inflation and consider stock as an alternative financial instrument. Further, availability of liquidity and the low interest rates stimulate the performance of the Nepalese stock market. More importantly, stock market has been found to respond significantly to changes in political environment and the policy of Nepal Rastra Bank. These findings help to design policies to stabilize or stimulate the share market in Nepal.

Phuyal (2016) studied on the relationship between macroeconomic variable and long term market movements in Nepalese capital market from January 2003 to December 2012 using vector auto regression (VAR) as well as vector error correction model (VECM) to examine the relation of these variables and found 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. It further showed that there was Granger causality between them. In the short run, the stock market index was affected by the lag values of NEPSE index up to six levels and remittance income, as shown by Wald test. These findings hold practical implications for policy makers, stock market regulators, investors and stock market analysts. While analyzing macroeconomics forces on five ASEAN stock markets including the markets of Malaysia, Indonesia, Thailand, Singapore and Philippines, Miseman et al. (2013) found four macroeconomics factors — interest rate, broad money supply, domestic output and inflation rate — to be affecting stock prices. According to Azeez and Obalade (2018), stock markets are considered to be sensitive for economic conditions within which it operates. Therefore, macroeconomic conditions are said to affect the development of the stock market. Some scholars also stated that banking sectors complement stock markets and vice-versa and this helps the investors invest in any nation where they feel financing conditions are favorable. In a study conducted in Nigeria, John (2019) argued that exchange rates do not seem to affect investment in stock market. Owiredu et al. (2016) found that inflation, real income, domestic savings and private capital flows did not affect stock market in Ghana. According to (Errunza & Hogan, 1998), the volatility rate differed from one country to another in European region.

Devkota and Dhungana (2019) examined the relationship between stock market index and four macroeconomic variables in Nepal. The researcher used time series data of 24 years from 1994 to 2018. The study employed ARDL bound test approach and claimed that there is a long-run association between macro-economic variables and stock market in Nepal. They further claimed that money supply has positive and interest rate have negative impact while gold price and exchange rate has no such impacts on stock market in Nepal. The study concluded that in the lack of derivative instruments in the market, stock market in Nepal is volatile and there are no alternative instruments for the investors in the market.

From the literature review conducted above, it is observed that various quantitative and qualitative factors affect the stock market prices globally and in Nepal. Many studies doc-

umented that macroeconomic variables highly determine the stock prices in the economy. When there are changes in the macro-economic policies, they impact the functioning of the companies and their earnings and ultimately affect the share prices of the companies. The above review of literature shows that there are many studies undertaken by various researchers at different time period by covering various determinants of stock prices. But there are few studies related to the major determinants of stock market price movement in Nepal. So, the study tries to fulfill the gap in this regard in the review of literature in the days to come.

Research Method

Specification of the variables and model

This study is based on analytical method used to analyze the existing information by evaluating the condition. This study is fully based on secondary times series data. The study covers sample period of 25 years from 1993/94 to 2018/19. The fiscal year 1993/94 is taken as the starting year for the required data for the present study because Nepalese stock market started transaction only that fiscal year. Stock market price/Nepse index (SP), real GDP (RGDP), broad money supply (MS), inflation rate (INF), interest rate (INT) and exchange rate (EXRT) are the major variables under study. The data for stock market price is taken from Nepal Stock Exchange and it is overall index. RGDP as measures of economic activity is obtained from the Central Bureau of Statistics of Nepal. Money supply is represented by broad money (MS) and obtained from Nepal Rastra Bank (NRB). Inflation measured by the consumer price index (INF) is taken from NRB. 91-days Treasury Bill Rates (INT), used for interest rate and EXRT (Nepalese currency with the US dollar) are also taken from NRB.

Focused on model and theory

The ARDL process is statistically more significant approach to determine the co-integration relationship in small sample to those of the Johansen and Juselius co-integration technique (Pesaran and Shin, 1999). It can be applied irrespective of whether the underlying variables are I(0), I(1) or a combination of both. (Pesaran and Pesaran, 1997). The ARDL considered sufficient number of lags to capture the data generating process in a general specific modeling framework, removes dilemma connected with omitted variables and provide unbiased and efficient results. (Narayan, 2004). The general hypothesis for co-integration can be stated as:

H_0 = No co-integrating equation

H_1 = H_0 is not true.

This paper follows the model of Chen et al., (1986) to identify factors in the APT model with slight change in macroeconomic variables which have an impact on stock market prices. Based on the review of literature and the availability of data, the study has used the following general behavior model.

$$SP = f(RGDP, MS, INF, INT, EXRT).....(1)$$

The study investigated the role of macroeconomic variables on stock market prices. In linear form and using natural log on both sides as follows:

$$\ln SP_t = \alpha + \beta_1 \ln RGDP_t + \beta_2 \ln MS_t + \beta_3 \ln INF_t + \beta_4 \ln INT_t + \beta_5 \ln EXRT_t + \mu_t.....(2)$$

Where, SP_t = Stock market prices, α = constant term, β_{1-5} = Coefficients, $RGDP_t$ = Real Gross Domestic Product, M_s = Broad money supply, INF = Inflation, INT = Interest rate, $EXRT$ = Exchange rate, μ_t = error term and t = time in year

The basic ARDL model can be written as:

$$y_t = \beta_0 + \beta_1 y_{t-1} + \beta_2 y_{t-2} + \beta_3 y_{t-3} + \dots + \beta_n y_{t-n} + \lambda_0 X_t + \lambda_1 X_{t-1} + \lambda_2 X_{t-2} + \lambda_p X_{t-p} + \dots + \mu_t \dots (3)$$

Again, the above equation is termed into error correction model as:

$$D \ln SP_t = \alpha + \beta_1 D \ln RGDP_t + \beta_2 D \ln MS_t + \beta_3 D \ln INF_t + \beta_4 D \ln INT_t + \beta_5 D \ln EXRT_t + \beta_6 ECT_{t-1} + \dots + \mu_t \dots (4)$$

Here, $\ln SP$, $\ln RGDP$, $\ln MS$, $\ln INF$, $\ln INT$, $\ln EXRT$ are the first differentiated variables, β_{1-6} are coefficient and μ_t is the error term. The ECT_{t-1} is the equilibrium error term of one-period lag. It guides the variables of the systems to restore back to the equilibrium means it signifies the time period to correct the disequilibrium.

Based on our model, ARDL bound testing will be as:

$$\begin{aligned} \Delta \ln SP_t = & \sum_{i=1}^q \beta_{1i} \beta_0 \Delta \ln SP_{t-i} + \sum_{i=0}^q \beta_{2i} \Delta \ln RGDP_{t-i} + \sum_{i=0}^q \beta_{3i} \Delta \ln MS_{t-i} + \sum_{i=0}^q \beta_{4i} \Delta \ln INF_{t-i} \\ & + \sum_{i=0}^q \beta_{5i} \Delta \ln INT_{t-i} + \sum_{i=0}^q \beta_{6i} \Delta \ln EXRT_{t-i} + \beta_7 \ln SP_{t-1} + \beta_8 \ln RGDP_{t-1} + \beta_9 \ln MS_{t-1} + \beta_{10} \ln INF_{t-1} \\ & + \beta_{11} \ln INT_{t-1} + \beta_{12} \ln EXRT_{t-1} + \mu_t \dots \dots \dots (5) \end{aligned}$$

Where Δ is the first difference operator, q is the optimum lag length, β_1 --- β_6 are short-run dynamics of the model and β_7 --- β_{12} are long-run elasticity. μ_t is the error term. The error correction form of the ARDL model is presented as:

$$\begin{aligned} \Delta \ln SP_t = & \beta_0 \sum_{i=1}^{q_1} \beta_{1i} \Delta \ln SP_{t-i} + \sum_{i=0}^{q_2} \beta_{2i} \Delta \ln RGDP_{t-i} + \sum_{i=0}^{q_3} \beta_{3i} \Delta \ln MS_{t-i} + \sum_{i=0}^{q_4} \beta_{4i} \Delta \ln INF_{t-i} \\ & + \sum_{i=0}^{q_5} \beta_{5i} \Delta \ln INT_{t-i} + \sum_{i=0}^{q_6} \beta_{6i} \Delta \ln EXRT_{t-i} + \lambda Ec_{t-1} + \mu_t \dots \dots \dots (6) \end{aligned}$$

Where q_1 --- q_6 is the optimal lag length and λ is the speed of adjustment parameter. Ec represents the error correction term derived from a long-run relationship from the above equation.

Data Analysis and Result

Trend analysis

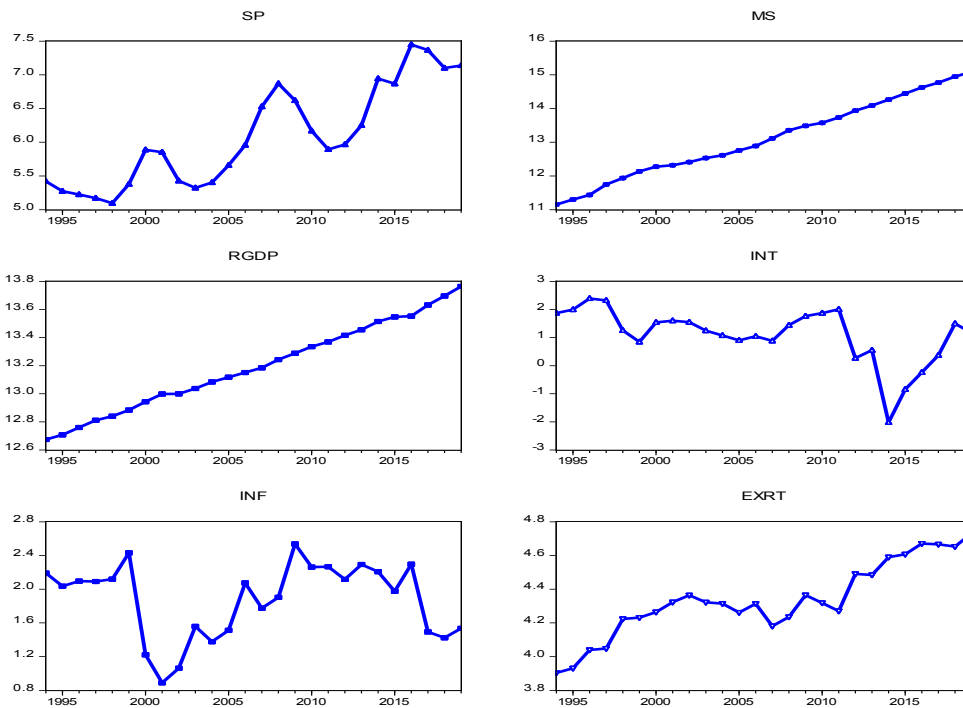
In trend analysis we observe trend of NEPSE index and other variables under study.

NEPSE Index

NEPSE Index is the market worth value of all listed companies which is the economic indicator that leads to the investor about the stock market trend. The higher NEPSE Index indicates the higher return in the stock market and lower NEPSE Index indicates the lower return in the stock market. Stock Exchange creates the investment opportunities in the primary as well as secondary market for the investors. NEPSE index as in base year i.e. 1993/94 was 226.0. Then after it was declined to 195.5 in 1994/95. The declining trend was continuing to 1997/98. In the fiscal year 1998/99 the trend of the NEPSE Index increased and reached about 1000 in fiscal year 2007/08. Again the declining trend was continuing in fiscal year 2011/12 plummeted at around 400 points. In the same fiscal year NEPSE index increased throughout and recorded highest in the fiscal year 2015/16 i.e. 1718.15 points. The increase percent was 78.74 percent as compared to the fiscal year 2014/15 at 961.23 points. It was due to the Monetary Policy 2015-16, in which NRB, the central monetary authority, had directed banks and financial institutions to raise minimum paid-up capital by up to four times by end of the fiscal year 2016/17. Similarly, declining trend was continuing in fiscal year 2018/19 decrease at around 1259.10 points

We can observe trend of current scenario of selected macroeconomic variables i.e., stock market prices (SP), real GDP, money supply, interest rate, inflation and exchange rate in the below figure:

FIGURE 1: Trend of Selected Macroeconomic Variables



Unit Root Test Result

Here we have used Augmented Dickey – Fuller Test (ADF) and Phillips – Perron test to check the stationary of the variable under study. The result is shown in Table 1.

All variables are not stationary and we make all variable stationary at first differencing.

TABLE 1: Unit Root Test Result

Variable	At level		At first difference	
	T-statistics	prob.	T-statistics	prob.
SP	-1.41861	0.5562	-3.46894	0.0182
RGDP	1.013912	0.9954	-4.60369	0.0013
MS	0.003498	0.9504	-3.47612	0.0179
INF	-2.36722	0.1605	-5.52452	0.0002
INT	-2.21147	0.2073	-3.90894	0.0077
EXRT	-1.11085	0.6951	-6.20812	0.0000

<i>Phillip-Perron Unit Root Test Result</i>				
Variable	T-statistics	prob.	T-statistics	prob.
SP	1.8435	0.9996	-4.5864	0.0014
RGDP	-0.01391	0.9954	-4.60369	0.0013
MS	-0.0282	0.9471	-3.4761	0.0179
INF	-2.3923	0.1538	-5.6629	0.0001
INT	-2.3065	0.1777	-5.5046	0.0002
EXRT	-1.0.275	0.7273	-6.20812	0.0000

(Result obtained from Eviews 9)

Table 1 shows that all variables are stationary at level one after getting into first differentiation so, we use ARDL Model.

TABLE 2: Lag Length selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	9.098225	NA	3.11E-08	-0.25819	0.036328	-0.18005
1	131.6543	173.6210*	2.55E-11	-7.47119	-5.409594*	-6.92425
2	176.8279	41.40918	2.32e-11*	-8.235659*	-4.40698	-7.219911*

The VAR approach is used to select the Lag Length Criteria.

Co-integration Result:

TABLE 3: Bound Test Co- integration Test for Co-integration Analysis of the Model

Test Statistic	Value	K
F-statistic	5.484552	5
Critical Value Bounds		
Significance	Lower Bound	Upper Bound
10%	2.08	3
5%	2.39	3.38
1%	3.06	4.15

Table 3 shows that the F-bound test for the above equation is further explained in terms of critical value. The stock market prices (SP) is treated as the dependent variable in this equation. The above result shows that the value of F-statistics is 5.4845 which exceeds the upper bound critical value of 4.15 at 1 percent level of significance. Hence, this implies that the macroeconomic variables (RGDP, MS, INT, INF, and EXRT) and stock market prices are co-integrated.

TABLE 4: ARDL long-run Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP	-9.70926	3.429809	-2.83085	0.0221
MS	3.801557	1.033645	3.677818	0.0062
INT	-0.64622	0.120287	-5.37228	0.0007
INF	-0.73541	0.23979	-3.06688	0.0154
EXRT	-5.53614	1.268484	-4.36437	0.0024
C	109.9884	34.74258	3.165811	0.0133

This model is the estimated long-run stock market price function can be expressed as the following equation:

$$\ln SP_t = 110 - 9.70926 * \ln RGDP_t + 3.801557 * \ln MS_t - 0.73541 * \ln INF_t - 0.64622 * \ln INT_t - 5.53614 * EXRT_t$$

Table 4 shows long run estimation of the model. It is observed that real GDP has negative and significant relationship with stock market prices at 5% level. Interest rate, inflation, exchange rate also have negative relation with stock prices. But money supply is positively significant at one percent level of significant. When there is an increase of one percent in money supply stock price will change by 3.80 percent. As well, when there is an increase of one percent in interest rate, stock market price will be decreased by 0.64 percent in the

long-run. Negative relationship between interest rate and stock market price implies that low interest rate makes stocks more attractive because of low cost of credit and low opportunity cost foregone by holding bank deposits. Hence, in case of low interest rates depositors may use their deposits to buy stock. In the same time, people can borrow at the low interest rates from banks to make investment in share market. This result is aligned with Devkota and Dhungana(2019) and Al Zararee and Ananzeh (2014) as well. It also follows the result obtained by Patel (2012).

TABLE 5 Error correction Representation of the Model (1,2,1 2,2,2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP)	1.065478	1.78731	0.596135	0.5676
D(RGDP(-1))	2.526508	1.843148	1.370757	0.2077
D(MS)	1.788094	0.492297	3.632146	0.0067
D(INT)	-0.1905	0.046508	-4.09604	0.0035
D(INT(-1))	0.301534	0.065706	4.589113	0.0018
D(INF)	-0.25343	0.091694	-2.76389	0.0245
D(INF)	-2.38116	0.554269	-4.29604	0.0026
D(EXRT)	1.385903	0.552948	2.506389	0.0366
ECMt-1	-0.85106	0.114611	-7.4256	0.0001

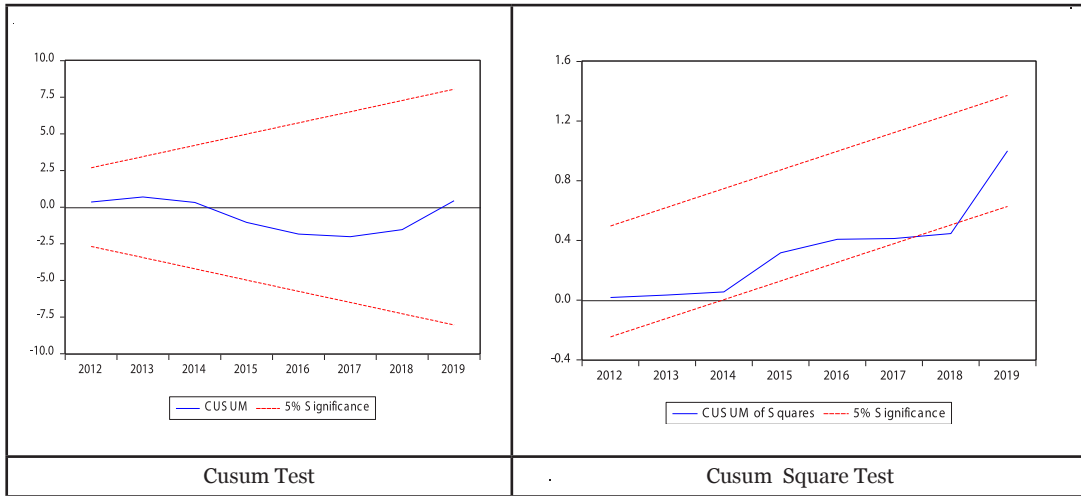
Table 5 indicates that the value of coefficient of the error correction is negative and significant. The negative sign and statistical significance of the error correction (cointEq-1) suggests the long run association of the variables under study. The coefficient of ECM (-1) as -0.85106, suggests that a deviation from the long-run equilibrium level of lnRGDP in one year is corrected by 85.10 percent over the following year.

TABLE 6: Diagnostic Test

Type of Test	Test statistic	P value
Heteroskedasticity	2.89	0.161
Serial correlation Lm Test	0.02	0.798
Normality (Jarque-Bera test)	0.27	0.874

In Table 6, P-value of the Brush-Pagan-Godfrey test is 0.16 which is higher than 5 percent and it can be concluded that the disturbance term in the model is homoscedastic. Similarly, P-value (0.798) in serial correlation Lm test shows that the study rejects the null hypothesis of serial correlation and concludes that there is no autocorrelation. Likewise P value (0.87) of normality test has also favoured our result.

FIGURE 2: CUSUM and CUSUM Square Test



As it is observed in Figure 2, the lines are between the significant of 5 percent. There is a little structural break as shown in cusum square test. In general, our model is robust and stable as both long run and short-run coefficients are acceptable over the study period 1994 to 2019. The diagnostic tests confirm that the models have the desired econometric properties.

Discussion

The study analyzes trend of stock market in Nepal along with exploration of macroeconomics determinants of stock market prices and role of macroeconomics variables in stock market of Nepal with the help of secondary data analysis. The stock market prices (NEPSE index) seems to fluctuate over the study period. Since 2003, the index increased continuously and reached about 1000 in fiscal year 2007/08. It continued to decrease after the global financial crisis until 2011. Thereafter, it started increasing and recorded the highest point of 1718.15 in the fiscal year 2015/16. Such high index was due to the monetary policy of the FY 2015/16, in which Nepal Rastra Bank directed banks and financial institutions to raise capital by four times. However, the index declined to 1259.10 in the FY 2018/19. Thus, the index in FY 1993/94 was 226.0 and reached to 1259.10 in FY 2018/19 after reaching high fluctuation in FY 2007/08 and FY 2015/16.

Hunjra et al. (2014) mentioned that major macroeconomic variables that affect the stock market price in Pakistan are real GDP growth rate, growth rate of broad money supply, inflation and interest rate, exchange rate, unemployment rate and stability, confidence and expectations. Similar result as of Hunjra et al. (2014) was depicted in the case of Nepal as similar factors were found to affect stock market price in Nepal as well. In our analysis, the coefficients of money supply and interest rate are significant. But in case of real GDP and inflation there is no signification relation with stock market prices. The study also confined that the relation of stock market prices with money supply is positive and it is negative with

real GDP, Inflation, Exchange rate and interest rate. Similarly, F- value of model is also significant at 1% level which shows significant. In this way we inferred that broad money supply, Inflation, interest rate and real GDP and exchange rate are the determinants of stock market price.

Conclusion

The Nepalese stock market is still in its initial phase. There is no long history of stock market in Nepal. Many practices, strategies and policies have to be done in this sector. The study addressed macroeconomic determinants of stock market price in Nepal. The result suggests that the fluctuation of stock market prices in long run is strongly related to broad money supply, interest rate, inflation and exchange rate. It is clear that interest rate is the determining variable of the stock market in Nepal. The direction of movement to stock market prices with interest rate is opposite. The interest rate holds same movement in same direction in short run as well long run. Low interest rate makes stocks more attractive because of low cost of credit and low opportunity cost foregone by holding bank deposits. The GDP, money supply and exchange rate can positively define in short run while only money supply holds positive relationship in long run. An increase in money supply causes stock market prices to increase. This suggests that an increase in money supply leads to economic expansion through increased cash flows and stock prices would benefit by expansionary monetary policy. Hence, money supply has significant impact on stock market in Nepal. Therefore, in conclusion, Nepalese stock market is highly determined by macro- economic variables in long run.

It is confirmed that broad money supply, interest rate, inflation and exchange rate can explain the stock market price in Nepal. Policymakers should take into consideration of various macro-economic indicators while formulating economic as well as financial policies. Furthermore, it is recommended that capital market development policies should be aligned with the macro- economic fundamental policies.

Conflict of Interest

Author declares no conflict of interest exists while preparing this article.

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