

**Quantitative Analysis on Impact of Selected Macroeconomic
Variables on Nepal Stock Exchange (NEPSE)**

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ABSTRACT

The objective of the study is to examine the impact of macroeconomic variables on stock market index in Nepal. The specific objective of the study is to find the trend of sampled macroeconomic variables: capital expenditure, economic growth rate, foreign reserve and interest rate to stock market index and to examine the impact of sampled macroeconomic variables on stock market index. The historical data are used for the period of 27 years of time starting from 1994 to 2021. Data is analyzed in a quantitatively through regression analysis in E-views. The methodology of the study is descriptive and causal research design and ARDL techniques. The study is mainly concerned with the selected macroeconomic variables: capital expenditure, economic growth rate, foreign reserve and interest rate and its impact to the stock market index in Nepal. The major findings are: there is positive correlation between NEPSE and FR, NEPSE and CE. Further, there is negative correlation between NEPSE and IR, NEPSE and EGR. The bound test results confirmed that there is a long run relationship among all the variables. In long run coefficient estimation of ARDL model, capital expenditure has positive and significant impact on stock market while other variables have insignificant impact on stock market. The paper highlights the findings that economic growth rate has positive and significant impact on stock market at lag (-1) whereas interest rate, foreign reserve and capital expenditure have no significant impact on stock market in short run.

Key words: Stock market returns, macroeconomic variables, ADF test, ARDL approach

1. INTRODUCTION

The stock market is essential to any nation's economic growth because it encourages investment, boosts business activity, and generates employment. The possibility of positive return in a portfolio is increased when investing in stocks as opposed to lower return assets like cash over the long run (Tan, 2020).

The only organized secondary stock market operating under the Securities Act of 2006 is NEPSE. The NEPSE was founded with the aim of allowing deals on its stock exchange via member, investors, and market intermediaries, such as brokers or market makers, in order to provide corporate and government assets unrestricted commercialization and volatility. In 1994, following the founding of NEPSE, formal secondary market trading in Nepal began. There were initially 62 firms and 50 brokers. Open outcry was the trading system, 190 companies are listed on the exchange as of November 2022. As of October 2022, there are 97 registered brokers with the Exchange. The poor performance of the nation's macroeconomic indicators was largely to blame for the current "bearish trend" on the Nepal Stock Exchange (Chalise, 2020) .

The Nepalese market, also known as the stock market index, is not yet old enough to be mature, which is why it is sometimes argued that a small number of influential investors influence the movement of the stock market index. Some claim that this volatility is solely the result of the supply and demand for equities, while others point to the impact of macroeconomic factors. Additionally, since they lack knowledge of the correlation between the stock market and macroeconomic issues, investors in the stock market make all of their investment decisions exclusively primarily on technical analysis. So, this study likewise seeks to deal with the problem. Our stock market, like other developing country emerging stock markets, is not entirely efficient, meaning it cannot move purely on economic fundamentals (Samadi,Bayani & Ghalandari, 2012).

The main objectives for this study is to evaluate the influence of macroeconomic variables on NEPSE stock market. The variables for this study are Capital Expenditure, Foreign reserve, Interest rate and Economic growth.

2. Objectives

- i. To assess how economic growth affects stock returns (NEPSE).
- ii. To assess how interest rate affect the stock market (NEPSE).
- iii. To examine how the capital expenditure affects stock returns (NEPSE).
- iv. To research how the foreign reserve affects the stock market index.

3. Research Hypothesis

In this study, the alternative theory is investigated in light of the issue description given below:

H1: The stock market index is significantly influenced by economic growth.

H2: The stock market index is significantly influenced by interest rate.

H3: Capital expenditure has a substantial influence on the stock market index.

H4: The stock market index is significantly influenced by the Foreign Reserve.

4. Significance of the study

The following points underline the study's significance:

- This study paves the way for upcoming works to be added to the amount of literature already in existence.
- The results of this study assists decision-makers in developing and carrying out macroeconomic policies.
- Finally, the study helps investors to manage their financial risk and adjust to the dynamically shifting macroeconomic climate while also helping them make wise investment decisions.

5. Scope

This study's scope is to evaluate how four macroeconomic factors—economic growth, interest rate, capital expenditure and foreign reserve —affect the stock market index and this study enable us to rightly invest on right time.

6. Limitations

The following are the study's main limitations:

- i. Despite the fact that there are numerous macroeconomic variables, this study will only use a small number of four owing to time and financial constraints.
- ii. The research is restricted to information from the Nepal Stock Exchange that is available for the 20-year period from 2002 to 2022.
- iii. There are also methodological limitations related to models and tools used for analysis as there are different models in addition to the models used in this research.

7. LITERATURE REVIEW

According to Niraula (2022), who examined the governmental policy and its impact on the movement of the price of the Nepal Stock Exchange, Stock price movements are inversely correlated with GDP and imports., but CRR, exportation, annual percentage rate, and price rises show a positive relationship with stock movement of price. Descriptive and statistics which is inferential were utilized in this investigation, which solely relied on secondary data, and SPSS software.

When Salma et al. (2021) set out to scrutinize the connection amid return of the stock and political economic factors in the United Kingdom from January 1999 to December 2007, they used a variety of microeconomic procedures, counting the Johansen Co-integration and Granger and Toda Yamamoto (TY) Causality tests, VAR Granger non Causality/Block Exogeneity Wald Test, ARDL, and ECM, which revealed that there is no correlation between variables and the stock.

Pakistan's Karachi Stock Exchange (KSE-100) return for the years 2002 to 2012 was the subject of a study by (Sohail & Zakir, 2011). In this study, secondary data were examined using Pearson association, vivid statistics, and a regression test. The findings showed that

while GDP and the Treasury Bills had negligible negative relationships with the KSE stock market, exchange rate and GDP had negligible positive relationships with the stock market and inflation.

As Maghayereh (2003) examined the long-term link amid stock prices of Jordanian and a few political economic variable quantities, counting exportations, overseas reserves, interest rates, price rises, and production of the industry, using monthly scheduled period sequence information for the phase from January 1987 to December 2000 and Johansen's method for analysis of co-integration. The author came to the conclusion that the selected variables are directly related to the stock value index in long-term balance.

8. Theoretical Review

Dow Theory

Dow Theory is a method of analyzing and interpreting stock market movements, developed by Charles Dow. It is one of the oldest and most influential forms of technical analysis. This theory is based on the premise that the stock market reflects the overall health of the economy and that it moves in primary trends that can be categorized as either bullish(upward) or bearish(downward). According to Dow Theory, these trends can be identified and predicted by analyzing the price movements of stock market indices (Benjamin, 1942).

Random Walk Theory

The Random Walk Theory, also known as the Random Walk Hypothesis, is a financial theory suggests that stock market prices and other financial asset prices move in a random and unpredictable manner. It posits that future price movements cannot be reliably predicted based on past price movements and any other historical data. According to the Random Walk Theory, stock prices follow a “random walk” because they are influenced by countless unpredictable factors, such as economic conditions, political events, investor sentiment and new information that emerges over time. These factors are constantly changing and cannot be reliably anticipated or incorporated into a trading strategy (Bhatta & Mishra, 2021).

Efficient Market Theory

The Efficient Market Hypothesis (EMH) is a fundamental theory in finance developed by economist Eugene Fama in 1960, suggests that financial market are highly efficient and reflect all available information in assets prices, is impossible to consistently beat the market or achieve above average returns through active trading or analysis of past price movement (Salma, et al., 2021).

9. RESEARCH GAP AND METHODOLOGICAL ISSUES

Finding the connection between these macroeconomic events and their impact on the stock market has been the subject of numerous studies. However, there are gaps in the studies describing how different macroeconomic factors in Nepal relate to stock prices and index movement. The Nepalese stock market has undergone various phases. The market reached an all-time high of 3198.60 points on August 18, 2021, from an all-time low of 292.31 points on June 15, 2011, as a result of significant macroeconomic shifts during the past ten years. What events and forces are behind these fluctuations in volatility? Every person, especially those with a stock market-related interest, strives to find the answers to these queries. In general, a company's future performance impacts whether its stocks perform well or poorly. Price movements, however, can occasionally be challenging to interpret in terms of fundamental changes. If fundamentals are not a factor, what else may change over time in stock prices?

Additionally, very few, previous research in Nepal have attempted to evaluate the relationship and influence of macroeconomic variables including on stock market return. Besides, the dynamic nature of the data and methodological variations may alter the study's findings. As a result, the study's main focus is on the following research issues:

- What connection exists among stock market outcomes and macroeconomic factors in the case of Nepal?
- Is there any connections between Nepal's capital expenditure, economic expansion, foreign reserve, interest rate and stock market returns (Karki, 2017)?

10.METHODOLOGY

The study was to evaluate the relationship between selected macroeconomic variables and stock market. This study adheres to the positivist school of thought because its objectives are to collect data, interpret it objectively, rely on quantitative observations to inform statistical analyses, and investigate the connections between factors like capital investment and NEPSE. This study uses a deductive research methodology that reads current theories, tests hypotheses, and helps to explain the correlation among carefully chosen variables and the NEPSE stock market. Since the purpose of this study is to examine how different macroeconomic factors affect stock market performance. This research is analytical, descriptive, and comparative in character. Through a descriptive and analytical study design, the quantitative approaches are carried out. In quantitative research, variables are measured, hypotheses are tested, and numbers and statistics are used (Saunders, 2009). This research focus on longitudinal study as this study helps to examine changes in selected variables for the period of 1994-2021 and to understand how these changes are related. This study is fully based on secondary data. These are already-assembled, easily-accessible statistics from various sources that are either current or historical (Ajayi, 2017). In order to conduct this research, data from CBS, NRB, World Bank, NEPSE and the Ministry of Finance is collected. For this study time-series analysis is used. It is a type of probability sampling method, which involves choosing a sample of data from a particular time period and each data point in that period has known and non-zero chance of being selected for the sample (Shrestha & Bhatta, 2018). For this research, population is based on all NEPSE annual index plus all independent variables that are published in respective websites. The sampling frame for this study are the list of companies listed on stock exchange such as NEPSE. The sampling size for this research is 27 years data of NEPSE index and independent variables from year 1994 to 2021. Secondary data of variables under study from CBS, NRB, World Bank, and MOF is collected. Data entry into an MS Excel sheet is followed by export to the E-Views software for analysis. The link between and among the variables in the NEPSE stock market is examined using a framework consisting of descriptive analysis, trend analysis, unit root test, and ARDL models.

11. DATA ANALYSIS

Trend Analysis

The trend of stock market index and other variables: economic growth, interest rate, capital expenditure and foreign reserve were observed.

Figure 1: Trend of Stock Market Index (NI)

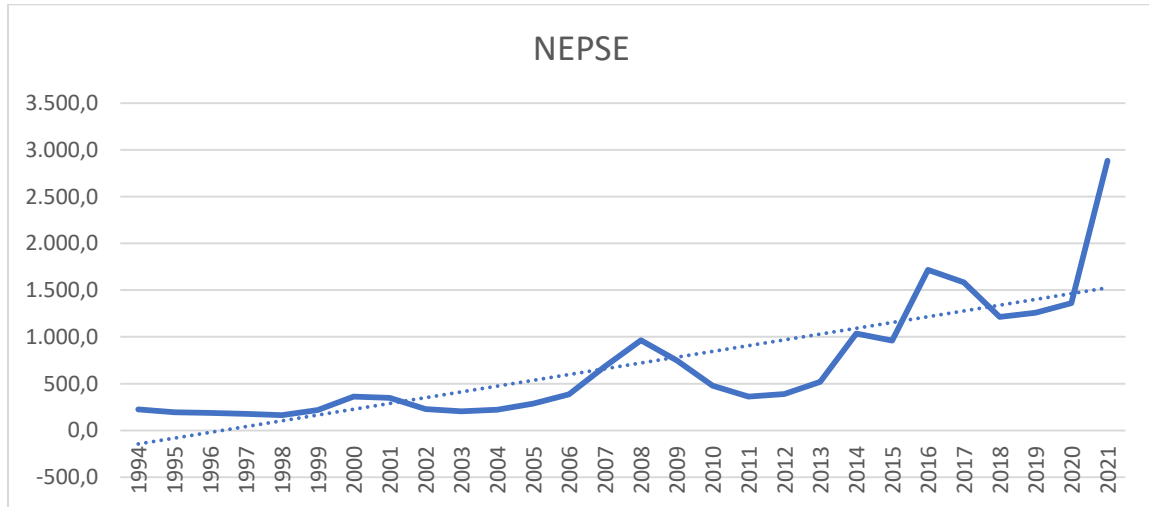


Figure 1 shows that trend line of the stock market index. Stock market index is the market worth of all the listed companies which informs to the investors about the trend of stock market. Starting from 1994 to 2021, stock market is continuously fluctuating and rising with span of time horizon. Stock market index become reach 2008,2014,2016 and started to increase afterwards. 1998, 2003, 2010,2015 and 2018 were the years where stock market index was in down position. Higher the stock market index indicates higher returns from stock market and lower the stock market index indicate lower the return from the investment in the stock market.

Figure 2: Trend of Economic growth rate (EGR)

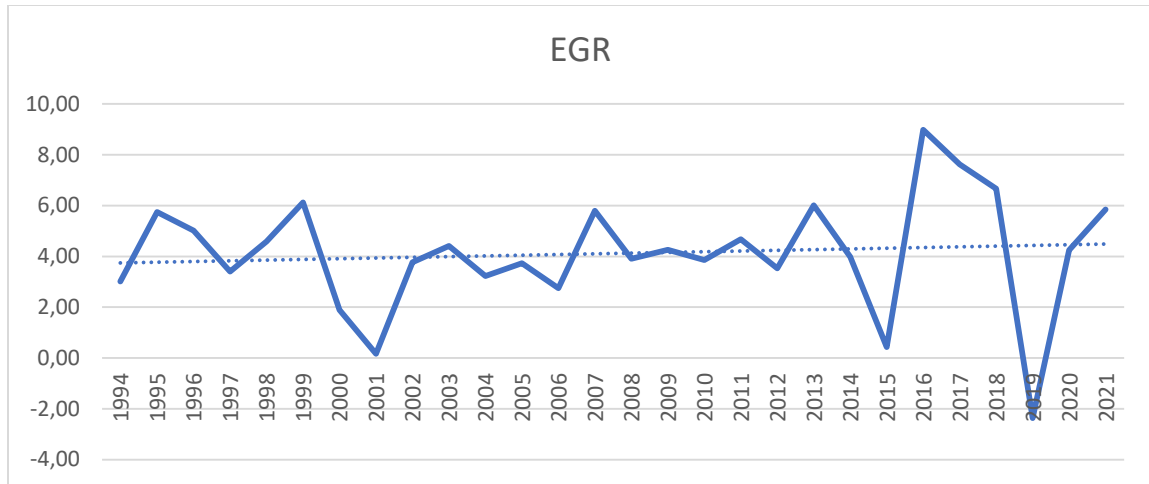


Figure 2 shows that trend line of economic growth rate. The economic growth rate is fluctuated in the study period. In 2016, economic growth rate is high comparing to other study period. However, in the study period 2019, economic growth rate is almost negative and started to increase from 2020 onwards. It is because of the nature of investment in an economy.

Figure 3: Trend of Interest rate (IR)

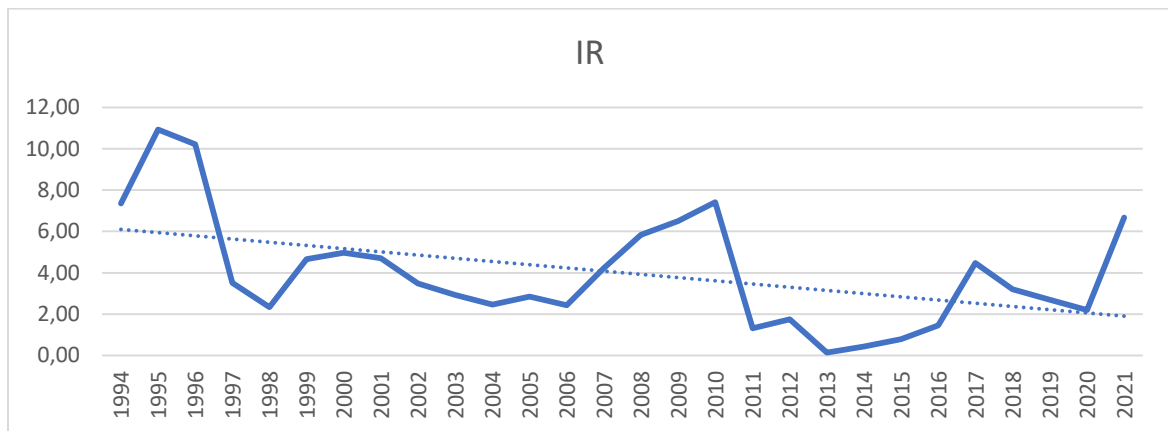


Figure 3 shows that interest rate in an economy. The rate of interest is fluctuated in the study period. It was the 1995 and 2010 where interest rate is in high peak and continuously increases from the year 2020 onwards. It is because in increase in demand for money or credit raise interest rate.

Figure 4: Trend of Capital Expenditure (CE)

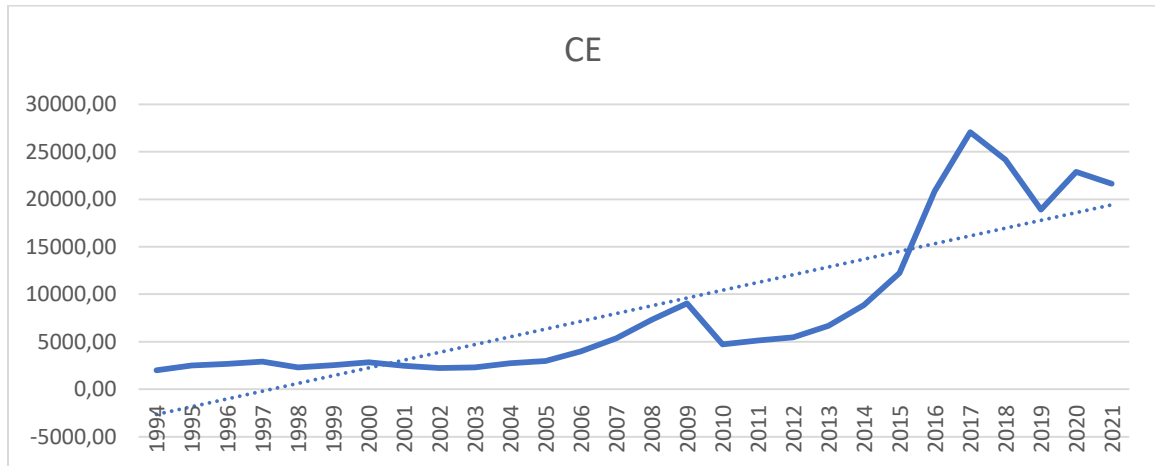


Figure 4 shows that the trend line of capital expenditure. The capital expenditure is fluctuated in the study period. In 2009 and 2017, capital expenditure is high which means the allocated budget were utilized more in these years. From the year 2021, capital expenditure is continuously decline.

Figure 5: Trend of Foreign Reserve(FR)

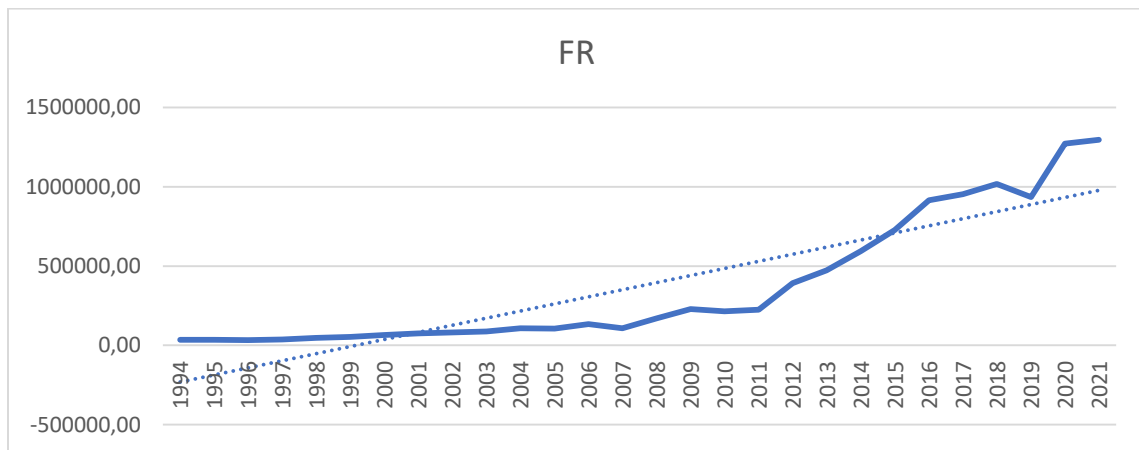


Figure 5 shows that foreign reserve in an economy. The foreign reserve continuously increases from the date of study period. However, the speed of increasing foreign reserve is continuous from 2011 to 2018. The higher the reserve, the higher is the capacity of the central bank to smooth the volatility of the balance of payment and assure consumption smoothing in the long term.

Descriptive Statistics

Table 1: The descriptive statistics of selected macroeconomic variables and NEPSE

| Variables | N | Mean | Maximum | Minimum | Standard | | |
|--------------------------------------|----|-------|---------|---------|-----------|----------|----------|
| | | | | | Deviation | Skewness | Kurtosis |
| NEPSE | | | | | | | |
| Index | 28 | 6.19 | 7.97 | 5.10 | 0.82 | 0.39 | 1.94 |
| Capital Expenditure (in ten million) | | | | | | | |
| | 28 | 8.64 | 10.21 | 7.59 | 0.87 | 0.55 | 1.87 |
| Economic growth (in %) | | | | | | | |
| | 28 | 1.94 | 2.51 | 0.00 | 0.46 | -2.72 | 11.85 |
| Foreign reserve (in million) | | | | | | | |
| | 28 | 12.14 | 14.07 | 10.43 | 1.24 | 0.18 | 1.65 |
| Interest rate (in %) | | | | | | | |
| | 28 | 1.08 | 2.39 | -2.02 | 0.95 | -1.41 | 5.47 |

Table 1 shows that the descriptive statistics of selected macroeconomic variables and stock market index. It shows the mean, median, maximum, minimum, standard deviation, skewness and kurtosis of independent and dependent variables. The mean of stock market index over the last twenty-seven years period is 6.19. Stock market index reached maximum of 7.97 and minimum of 5.10 during the study period. During that, stock market index's standard deviation was 0.82. The mean of capital expenditure is 8.64, mean of economic growth rate is 1.94, mean of foreign reserve is 12.14 and interest rate mean during the study period is 1.08.

The standard deviation of stock market index during the study period is 0.82 and standard deviation of economic growth rate is 0.46, standard deviation of capital expenditure is

0.87, standard deviation of interest rate is 0.95 and foreign reserve standard deviation during the study period is 1.24.

The maximum and minimum of foreign reserve during the study period is 14.07 and 10.43 respectively. In the same way the maximum and minimum of capital expenditure is 10.21 and 7.59 respectively. The maximum and minimum of economic growth rate is 2.51 and 0.00 respectively. In the similar manner, the maximum and minimum of interest rate is 2.39 and -2.02 respectively.

Correlation Analysis

Table 2: The result of correlation analysis

| Correlation | | | | | |
|--------------------|-----------|-----------|-----------|------------|-----------|
| Variables | NI | IR | FR | EGR | CE |
| NI | 1.000000 | -0.195138 | 0.907070 | -0.034142 | 0.947338 |
| IR | -0.195138 | 1.000000 | -0.443860 | 0.022529 | -0.241168 |
| FR | 0.907070 | -0.443860 | 1.000000 | -0.064549 | 0.939284 |
| EGR | -0.034142 | 0.022529 | -0.064549 | 1.000000 | -0.012295 |
| CE | 0.947338 | -0.241168 | 0.939284 | -0.012295 | 1.000000 |

Table 2 shows that results of correlation analysis. There is the positive correlation between the NI and CE. The correlation coefficient is 0.9473, which is close to +1, which means NI and CE strong positive correlation. In other words when NI increases CE also increases and when NI decreases CE also decreases. There is the strongly positive correlation between the NI and FR. The correlation coefficient of NI and FR is 0.9070. However, there is the negative correlation between the NI and IR and NI and EGR.

There is the positive correlation between the FR and NI. The correlation coefficient is 0.907070, which is close to +1, which means FR and NI strong positive correlation. In other words when FR increases and when NI also increases and vice versa. Similarly, there is the strongly positive correlation between the EGR and IR. The correlation coefficient of EGR and IR is 0.02252.

Moreover, the correlation coefficient 0.907070 and 0.9392 shows that there is the positive correlation between the FR and NI, CE and FR. However, the coefficient -0.4438 and -

0.0645 shows that there is the negative correlation between the FR and IR and FR and EGR respectively. The coefficient 0.02252 shows the positive correlation between the EGR and IR. However, there is the negative correlation coefficient -0.0341, -0.0645 and -0.0122 shows negative correlation between the EGR and NI, EGR and FR and EGR and CE respectively.

In the same way the coefficient -0.2411 and -0.0122 shows the negative correlation between the CE and IR and CE and EGR respectively. However, the positive correlation coefficient 0.9473 and 0.9392 shows positive correlation between the CE & NI and CE and FR.

Unit root results

Table 3: ADF unit root method

| Variables | Level | | 1st Difference | |
|-----------|-----------|---------------------|----------------|---------------------|
| | Intercept | Trend and Intercept | Intercept | Trend and Intercept |
| LOGEGR | 0.0006 | 0.0042 | 0.0000 | 0.0000 |
| LOGCE | 0.9069 | 0.1813 | 0.0057 | 0.0252 |
| LOGIR | 0.1590 | 0.4484 | 0.0001 | 0.0005 |
| LOGFR | 0.9598 | 0.1775 | 0.0000 | 0.0002 |
| LOGNI | 0.9998 | 0.0223 | 0.0013 | 0.0081 |

Table 3 shows that ADF unit root method. In statistics and econometrics, an Augmented Dickey-Fuller test (ADF) test the null hypothesis that a unit root is present in time series sample. The more negative it is, the stronger the rejection of the hypothesis that there is a unit root at some level of confidence.

Here, if probability value is less than 5%, reject H_0 .

H_0 : There is a unit root (series is non-stationary).

From these values, it can be inferred that the data series of economic growth rate is stationary at level. Similarly, data series of capital expenditure, interest rate, NEPSE index and foreign reserve is non-stationary at level and stationary at first difference. The P- value of all variable are less than level of significance at 5%. Thus, null hypothesis of all variable is not accepted and alternative hypothesis are accepted. This indicates that the

variables such as economic growth, interest rate, capital expenditure, and foreign reserve are stationary. Since variable are mixed I.e., stationary and non-stationary the study continues to estimate the ARDL co-integration test because it measures mixed variable more efficiently and it is more realistic.

ARDL Goodness test of data

Table 4: Goodness test of data

| | |
|--------------------|-----------------|
| R-squared | 0.948431 |
| Adjusted R-squared | 0.924163 |
| Prob(F-statistic) | 0.000000 |

Table 4 shows that the goodness test of the data, the R² value which is closer to 100% is 94.84% variation in NEPSE index is caused by capital expenditure, economic growth rate, foreign reserve and interest rate collectively. The adjusted R² value 92.41% variation in NEPSE index is caused by all independent variables excluding the error term. Generally, a higher r-squared indicates a better fit for the model. The R-squared may need to be above 0.897 for a regression model to be considered reliable.

Test of Model Fit

The value of probability (F-statistic) is 0.000000 which is less than 0.05. This indicate that overall or whole model is significant or best fit.

ARDL Bound Test for Co-integration

The unit root results representing all the series variables are stationary at first difference. The bound test approach for co-integration is used to investigate the long run relationship between stock market and selected macroeconomic variables.

Table 5: F-bound test for co-integration

| Test Statistics | Value | K |
|------------------------|--------------|----------|
| F-statistics | 5.0909 | 4 |

| Critical Value Bounds | | |
|------------------------------|--------------------|--------------------|
| Significance | Lower limit | Upper limit |
| 10% | 2.2 | 3.09 |
| 5% | 2.56 | 3.49 |
| 2.50% | 2.88 | 3.87 |
| 1% | 3.29 | 4.37 |

From the above table we can see the value of F-statistics is 5.0909, which is greater than the value of upper bound i.e., 3.29 at 5 percent level of significance. So, we can conclude that there exists overall long run relationship or association between dependent variable NEPSE index and all independent variable namely economic growth rate, interest rate, capital expenditure, and foreign reserve. Thus, with the help of bound test value, it has been concluded that there exists cointegration among the variables and long-run and short-run coefficients can be estimated.

Long run coefficient estimation of ARDL model of each independent variables at different levels

Table 6: Long run estimation

| Variables | Coefficient | t-statistic | P-value |
|------------------|--------------------|--------------------|----------------|
| LOGIR | 0.06086 | 0.685135 | 0.5025 |
| LOGFR | 0.218843 | 1.190471 | 0.2502 |
| LOGEGR | -0.355998 | -1.283226 | 0.2166 |
| LOGCE | 0.574121 | 2.461038 | 0.0248 |
| C | -0.834462 | -0.841392 | 0.4118 |

Interpretation of P-value:

From the table 6, we can get the P-value of interest rate is 0.5025, which is greater than 0.10. This indicates that at 10 % level of significance there is no long run relationship between interest rate and stock market return. In other word, there is insignificant

relationship between interest rate and NEPSE return at 10 % level of significance. $H01$ is accepted at 10 % level of significance.

The P-value of foreign reserve is 0.2502, which is greater than 0.10. This indicates that at 10 % level of significance there is no long run relationship between foreign reserve and stock market return. In other word, there is insignificant relationship between foreign reserve and NEPSE return at 10 % level of significance. $H02$ is accepted at 10 % level of significance.

Similarly, the P-value of GDP i.e., 0.2166, which is greater than 0.10. This indicate that there is no long run relationship of economic growth rate i.e., GDP with NEPSE return. In other word, there is no significant relationship between economic growth rate and stock market return. $H03$ is accepted.

Likewise, the P-value of capital expenditure is 0.0248, which is less than 0.10. This indicates that at 10 % level of significance there is long run relationship between capital expenditure and stock market return. In other word, there is significant relationship between capital expenditure and NEPSE return at 10 % level of significance. $H04$ is rejected at 10 % level of significance.

Interpretation of Coefficient:

Coefficient of capital expenditure is 0.574121. This indicates that if capital expenditure is increase by 1 percent than the dependent variable i.e., NEPSE return is increase by 0.574121 percent in long run. Hence, NEPSE return is positively influenced by capital expenditure in long run.

Short-Run Estimate

ARDL Error Correction Estimate help to estimate short run association between each individual Variable at Different Level.

Table 7: Short run estimates

| Variable | Coefficient | t-statistic | P-value |
|-----------------|--------------------|--------------------|----------------|
| DLOG_NEPSE (-1) | 0.498278 | 3.883245 | 0.0012 |

| | | | |
|----------------|-----------|-----------|--------|
| DLOG_EGR | -0.068497 | -1.023224 | 0.3205 |
| DLOG_EGR (-1) | 0.229177 | 3.687004 | 0.0018 |
| CointEq (-1) * | -0.96608 | -6.287248 | 0.0000 |

The value of CointEq is 0.0000, which indicate that overall short-run relationship is significant at 1 percent level of significance on interest rate, capital expenditure and foreign reserve. It shows the short run association between dependent variable and independent variables.

Interpretation of P-value:

From the table 7, we can get the P-value of economic growth rate at lag (-1) is 0.0018, which is less than 0.10. This indicates that at 10 % level of significance there is short run relationship between economic growth rate and stock market return. In other word, there is significant relationship between economic growth rate and NEPSE return at 10 % level of significance. H_0 is rejected at 10 % level of significance.

Interpretation of Coefficient:

Coefficient of economic growth rate at lag (-1) is 0.2291. This indicates that if economic growth rate is increased by 1 percent than the dependent variable i.e., NEPSE return is increased by 0.2291 percent in short run. Hence, stock market return is expected to be positively influenced by the economic growth rate in short-run at lag (-1).

Model Adequacy Test

Serial Correlation LM test

Table 8

Breusch- Godfrey Serial Correlation LM test:

| | | | |
|----------------------|----------|-----------------------------|--------|
| F-statistic | 0.681595 | Prob. F (2,15) | 0.5208 |
| Obs R-squared | 2.166017 | Prob. Chi-square (2) | 0.3386 |

In table 8, value of F-statistics is 0.6815 and its corresponding P-value is 0.33 which is greater than 5% level of significance, from which the study accepts null hypothesis of serial correlation and concluded that there is no autocorrelation.

The Heteroskedasticity Test

Table 9

Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|----------------------------|----------|-----------------------------|--------|
| F-statistic | 1.730516 | Prob. F (8,17) | 0.1626 |
| Obs R-squared | 11.66988 | Prob. Chi-square (8) | 0.1666 |
| Scaled explained SS | 4.750464 | Prob. Chi-square (8) | 0.7839 |

In table 9, the corresponding P-value of the Breusch-Pagan-Godfrey test is 0.166 which is higher than 5 % and it can be concluded that the disturbance term in the model is homoscedastic.

Normality Test

The normality tests are supplementary to the graphical assessment of normality. One of the tests for the assessment of normality is Jarque-Bare test.

Figure 6

Normality test: Jarque-Bare test

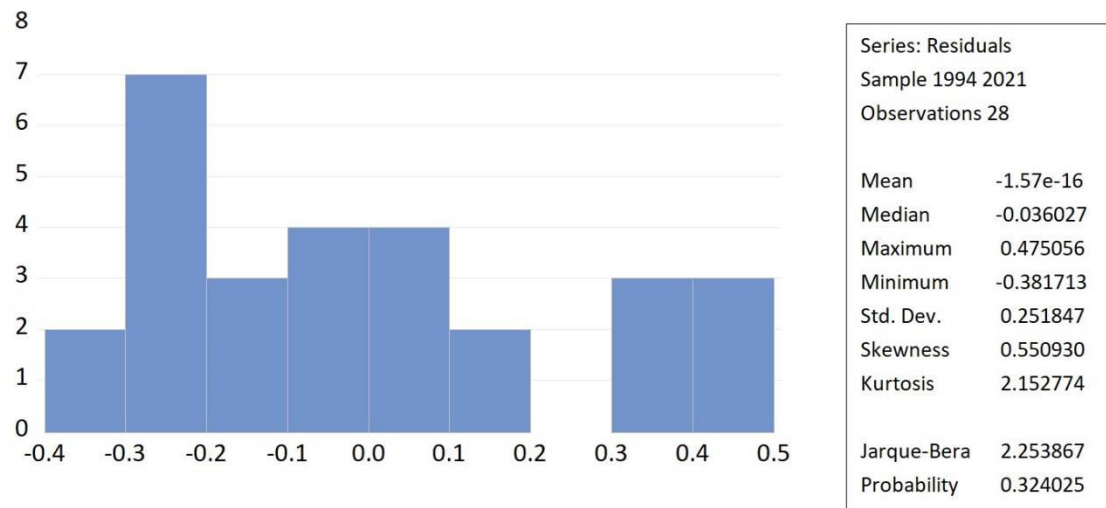


Figure 6 exhibits the result of Jarque-Bera test statistics showed that residuals are normally distributed. In the above figure null hypothesis of residuals are normally distributed whereas alternative hypothesis of residuals is not normally distributed. The probability of Jarque-Bera test is greater than 5% that is 32.40%. That is why we accept the null hypothesis.

12. EVALUATION

The main objective of this study was to examine the impact of macroeconomic variables on stock market of Nepal and to show the trend of NEPSE Index and four macroeconomic variables (interest rate, economic growth, foreign reserve and capital expenditure). To fulfill this objective, this study used the dataset of 27 years over periods 1994-2021. To examine the relationship of NEPSE with macroeconomic variables this study used trend line, table and graphs. The ADF test was applied to test the stationary of the time series data. The long run model was estimated by using F-bound test. Similarly, ECM model was applied for the short run dynamism of the model. Finally, to test the reliability of the model, various diagnostic test including serial co-relation and heteroscedasticity in the error term has been applied. The major findings of the study are listed as given below:

- i. The study analyzes trend of stock market in Nepal along with exploration of macroeconomic determinants of stock market prices and role of

macroeconomic variables in stock market in Nepal with the help of secondary data.

- ii. The stock 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 and reached to 1259.10 in the FY 2018/19 after reaching high fluctuation in FY 2007/08 and FY 2020/21.
- iii. The result of ADF test shows that all variables are stationary only after the first difference i.e., all variables used in this study are I (1).
- iv. The F-bound test indicates that variables are co-integrated and long run model is free from spurious regression.
- v. The result obtained suggested that there is negative relationship between interest rate and NEPSE index in long run. Fluctuation of NEPSE index in long run is strongly and positively related to capital expenditure and there is insignificant relationship of NEPSE Index with foreign reserve and economic growth rate,
- vi. The result of ECM model indicates that in short run, capital expenditure has insignificant relation with NEPSE index, foreign reserve and interest rate have negatively relationship with NEPSE index and economic growth rate is positively related to NEPSE index at lag (-1).

13. CONCLUSION

The result obtained suggested that the fluctuation of NEPSE Index in long run is strongly related to capital expenditure. Economic growth has negative coefficient so the direction of movement to NEPSE Index with economic growth is opposite in long run, regarding the short run relation between NEPSE Index and economic growth, the coefficient of

economic growth is found to be positive and significant at lag (-1). Interest rate and foreign reserve holds negative and insignificant relation with NEPSE Index in both short and long run.

Therefore, the result suggests that the selected macroeconomic variables (capital expenditure, economic growth rate, interest rate and foreign reserve) describe the stock market in long run and short run respectively which confirms the belief that the selected macroeconomic variables affect the Nepalese stock market.

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