

# Determinants of NEPSE Index: Insights from ARDL Modeling

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## Abstract

**Background:** The stock market, acting as an economic barometer, crucially influences a nation's development by gauging its financial stability. In contrast, sustainable stock market indices have become vital in assessing listed companies' long-term viability and ESG performance.

**Objectives:** The research aims to uncover the influence of various macroeconomic factors (GDP growth, inflation, broad money supply) and bank-specific indicators (bank stability, funding risk, interest rate) on the NEPSE index.

**Methods:** This study delves into the determinants shaping the NEPSE index in Nepal, utilizing the autoregressive distributed lag (ARDL) model with annual time series data spanning from 1995 to 2022. The NEPSE index, as a measure of sustainable stock market performance, becomes crucial in understanding market dynamics. This study analyzes the impact of GDP growth, inflation, broad money supply (M2), and bank-specific indicators on the NEPSE index.

**Results:** The study found that the NEPSE index is positively influenced by GDP growth, broad money supply (M2), and bank stability (BSTAB). Policymakers are urged to focus on fostering GDP growth, implementing effective monetary policies, and enforcing robust banking regulations to create a conducive market atmosphere, thereby inspiring investor trust. Conversely, the study demonstrates that inflation and funding risk (FRISK) exert a negative and significant impact on the NEPSE index. Hence, policymakers and central banks are advised to closely monitor and manage these variables to ensure stability and investor confidence, thereby nurturing a healthy stock market environment.

**Conclusion:** There is a long-term equilibrium relationship between selected variables and the NEPSE index. Macroeconomic policies and bank-specific quality play an important role in the sustainable NEPSE index.

**Implications:** The outcomes of this research underscore the importance of maintaining stable inflation rates and effectively managing funding risks and interest rates. By doing so, regulators can facilitate a stable and conducive environment for stock market investments, encouraging economic growth and investor participation. These insights are invaluable for shaping effective policies and regulations, promoting a vibrant stock market, and fostering economic stability in Nepal.

**Keywords:** NEPSE Index; macroeconomic and bank-specific variables; ARDL approach

**JEL Classification Code:** E63, G21, G28

## I. Introduction

The stock market plays a vital role in the economic development of a country, serving as a barometer for assessing the overall health and stability of its financial system (Ali and Gupta, 2011; Ghani et al., 2022). Sustainable stock market indices have emerged as a crucial indicator for evaluating the long-term viability and environmental, social, and governance (ESG) performance of companies listed on the stock exchange (Benlagha and EI Omari, 2022). The factors that influence the sustainability of the stock market index are essential for policymakers, investors, and market participants to make informed decisions and foster sustainable economic growth (Patel 2012; Oskenbayev, 2011). In the context of Nepal, a developing country with a growing capital market, examining the determinants of the sustainability of the stock market index becomes particularly relevant (Shrestha, 2014).

The Stock Market Index in Nepal is a metric that evaluates the overall environmental, social, and governance (ESG) performance of companies listed on the stock exchange (Shrestha and Subedi, 2014; Shrestha and Bhatta, 2017; Gwachha, 2022). It serves as an essential tool for investors and stakeholders to assess the sustainability practices of Nepalese businesses. This index aims to promote responsible investing and encourage companies to adopt sustainable practices that can contribute to long-term economic growth while considering social and environmental concerns. The Nepal Stock Exchange (NEPSE), established in 1993, has played a crucial role in channeling savings toward productive investments and facilitating capital formation. As the market continues to evolve, there is a growing recognition of the importance of sustainability in investment decisions (Shrestha and Subedi, 2014; Gwachha, 2022). The integration of sustainability considerations into the stock market can provide valuable insights into the long-term viability, resilience, and responsible practices of listed companies.

One of the key factors influencing the sustainability of the stock market index is the macroeconomic environment. Macroeconomic variables play a significant role in shaping the sustainability of stock market indices. GDP growth has been widely recognized as a positive indicator of stock market performance (Zhou et al., 2015; Shrestha & Bhatta, 2017). Similarly, GDP growth positively affects stock market performance, indicating that a thriving economy provides a favorable environment for sustainable investing (Nguyen et al., 2022; Okoro, 2017; Zhou et al., 2015). Numerous studies conducted in various countries have demonstrated a positive relationship between GDP growth and stock market indices, suggesting that a thriving economy provides a favorable environment for sustainable investing (Ghani et al., 2022; Ilahi et al., 2015).

Similarly, inflation and interest rates are additional macroeconomic variables that impact the sustainability of stock market indices. Low and stable inflation rates are generally associated with a stable investment climate, as they reduce uncertainty and promote investor confidence (Nițoi & Pochea 2019; Matadeen, 2017; Ilahi et al., 2015; Zhou et al., 2015). High inflation rates, on the other hand, erode the purchasing power of individuals and can negatively affect the stock market's sustainability. The relationship between inflation and the stock market index's sustainability in Nepal needs to be examined to understand the dynamics within the local market.

Moreover, stable interest rates are important for supporting sustainable investing by providing favorable borrowing conditions for companies stimulating economic growth and supporting sustainable investing practices (Kaur & Chaudhary 2022; Ghani et al., 2022; Ilahi et al., 2015; Hsing, 2014). Lower interest rates tend to stimulate economic activity and encourage investments, as borrowing becomes more affordable. This positive impact on corporate performance is likely to reflect on the NEPSE index, as investors expect higher returns and capital appreciation from stocks (Shrestha and Bhatta, 2017; Gwachha, 2022; Shrestha and Subedi, 2014).

Broad money supply, a measure of the total amount of money circulating in the economy, can affect the sustainability of the stock market index. An increase in the money supply can potentially stimulate economic activity and enhance the sustainability of the stock market index (Hsing, 2014; Ho & Odhiambo, 2018). Conversely, excessive money supply growth may lead to inflationary pressures and impact the stability of the stock market. The relationship between broad money supply and the sustainability of the stock market index in Nepal needs to be explored to understand the impact of monetary policy and the availability of liquidity on market stability (Shrestha and Bhatta, 2017; Gwachha, 2022; Shrestha and Subedi, 2014).

In addition, the NEPSE index is influenced by bank-specific factors, including the stability, financial risk, and performance of the banking sector. A robust regulatory framework that promotes transparency, disclosure, and investor protection is essential for maintaining the integrity of the market and fostering investor confidence (Adusei, 2015; Hsing, 2014). Funding risk refers to the potential vulnerability of financial institutions or market participants to difficulties in obtaining funding. In the context of the stock market index, funding risk can arise from various factors such as market liquidity, investor confidence, and access to capital. High funding risk can adversely affect the sustainability of the stock market index by reducing market participation and liquidity (Pham et al., 2021; Yensu et al., 2021; Adusei, 2015; Shrestha and Subedi, 2014). Bank stability plays a pivotal role in the functioning of an economy and its financial markets. A stable banking sector with strong capital adequacy, effective risk management practices, and robust governance contributes to the sustainability of the stock market index (Ozili, 2019; Yensu et al., 2021; Megaravalli & Sampagnaro, 2018; Hsing, 2014). In Nepal, banks with a robust financial position, effective risk management practices, and sufficient capital buffers are likely to contribute positively to the NEPSE index.

The relationship is crucial for investors, policymakers, and market participants to make informed decisions and assess the overall health of the stock market. This research will provide valuable insights into the factors influencing the sustainability of the stock market index in Nepal. This research also contributes to improved risk management strategies that can enhance the stability and resilience of the stock market, protecting investors and safeguarding the overall financial system. The research also contributes to serving as a reference for scholars, researchers, and students interested in understanding the dynamics of stock markets and their sustainable implications.

While there have been several studies exploring the factors influencing the sustainability of stock market indices in various countries, there is a noticeable research gap when it comes to understanding these factors specifically in the context of Nepal. Furthermore, previous studies have predominantly focused on developed economies, leaving a gap in the literature regarding emerging markets like Nepal. Thus, there is a need for comprehensive research that specifically examines the factors influencing the sustainability of the stock market index in Nepal. Therefore, the study aims to investigate the crucial research matter: What are the key macroeconomic and bank-specific factors that significantly influence the fluctuations and performance of the Stock Market Index in Nepal?

On the other hand, unstable or high interest rates can discourage investors and affect the stability of the stock market index. Various factors, such as macroeconomic and institutional elements, play a role in determining the sustainability of stock market indices. Consequently, understanding the effects of these factors is essential in grasping what influences the stability of Nepal's stock market index. This study is structured as follows: Section I provides an extensive introduction and literature review; Section II details the methodology; Section III presents the findings and discussions; and Section IV concludes the paper and provides recommendations.

## II. Methodology

### Data

The research study is based on secondary data. Data on macroeconomic and bank-specific factors was gathered from sources including Nepal Rastra Bank, Security Board of Nepal, and Nepal Stock Exchange publications, such as the Nepalese economy database and quarterly economic bulletin, and accessible at [www.nrb.org.np/publication](http://www.nrb.org.np/publication). The study employs panel data encompassing all commercial banks in Nepal and annual time series data, spanning 27 years from 1995 to 2022. This study drawing on both theoretical and empirical viewpoints, has recognized multiple factors that impact the long-term stability of the stock market index in Nepal. This existing literature provides valuable insights into the dynamics shaping Nepal's sustainable stock market index.

### Dependent variables

The Nepal Stock Exchange, operating since 1993, is Nepal's only stock market, with 209 listed companies. The NEPSE Index reflects the overall market return by using weighted averages of listed firms' market capitalizations and considering individual stock fluctuations. Various factors serve as independent variables such as macroeconomic and bank-specific affecting individual stock returns, while the NEPS Index is a dependent variable influenced by these factors. The study examined year-end data for the NEPSE Index.

### Independent variables

Based on the reviewed stock market development theory and empirical literature, this study identifies certain variables that play a role in determining the sustainable stock market index in Nepal. These variables encompass both macroeconomic and bank-specific factors. Bank-specific factors include funding risk (FRISK), bank stability (BSTAB), and interest rate, while macroeconomic factors consist of GDP growth rate, board money supply (M2), and inflation. The variable of bank funding risk (FRISK) and bank stability (BSTAB), computed using Z-scores, is considered significant in the banking literature, as highlighted by Adusei (2015), Koskei (2020), Yensu et al. (2021), and Ozili (2019), among others. Previous studies (Pham et al., 2021; Yensu et al., 2021; Koskei, 2020; Ozili, 2019) have reported these variables as significant determinants of market development, employing various combinations. Table 1 provides a summary of the selected variables, their measurement, and the expected sign of their impact on a sustainable stock market index in this study.

**Table 1: Summaries of explanatory variables and their expected sign**

Variables	Notation	Proxies/Description	Expected Sign
NEPSE Index	NEPSE	Annual Points (July 1 <sup>st</sup> each year)	
<b>Macroeconomic Variables</b>			
GDP Growth Rate	GDP	$[GDP_{t+1} - GDP_t]/GDP_t$	+
Inflation Rate	INF	Consumer Price Index (CPI)	-
Board Money Supply	M2	Board Money Supply/ Real GDP	+
<b>Bank-Specific Variables</b>			
Funding Risk	FRISK	$Z - score = \frac{[TD + TE]/TA}{\sigma[TD/TA]}$	±
Bank Stability	BSTAB	$Z - score = \frac{ROA + TE/TA}{\sigma(ROA)}$	+
Interest Rate	INT	91 days weighted average T-bill rate	±

Sources: From theory and empirical literature review

**Empirical model**

Compared to the co-integration procedure developed by Johansen and Juselius (1994), the ARDL process has a higher level of statistical significance when it comes to determining the co-integration relationship in small samples (Pesaran and Shin, 2001). The ARDL process, as outlined by Pesaran and Pesaran in 1997, can be utilized irrespective of whether the underlying variables are stationary (I(0)), integrated of order one (I(1)), or a mix of both. This flexibility allows for its application in a wide range of economic contexts. In order to incorporate the data generation process within a comprehensive and specific modeling framework, address the issue of missing variables, and yield objective and effective findings, the ARDL approach considers an appropriate number of lags, as discussed by Narayan in 2005.

Based on prior empirical studies, this research develops panel data models to explore the impact of macroeconomic and bank-specific variables on the stability of financial institutions. The study aims to understand the relationship between these factors and the resilience of banking institutions. The following econometric model has been developed for this purpose:

$$\begin{aligned}
 NEPSE_{it} = & \alpha_0 + \sum_{i=0}^q \delta_1 \Delta NEPSE_{t-i} + \sum_{i=0}^q \delta_2 \Delta EXR_{t-i} + \sum_{i=0}^q \delta_3 \Delta GDP_{t-i} \\
 & + \sum_{i=0}^q \delta_4 \Delta INF_{t-i} + \sum_{i=0}^q \delta_5 \Delta M2_{t-i} + \sum_{i=0}^q \delta_6 \Delta BSTAB_{t-i} \\
 & + \sum_{i=0}^q \delta_7 \Delta FRISK_{t-i} + \sum_{i=0}^q \delta_8 \Delta INT_{t-i} + \delta_9 E_{vt} \dots \dots \dots (1)
 \end{aligned}$$

**III. Result and discussion**

**Descriptive statistics**

Descriptive statistics for the selected research variables are presented in Table 2. The NEPSE index has an average value of 755.163 and a standard deviation of 674.706, ranging from a minimum of 163.350 to a maximum of 2883.410 throughout the study period. The BSTAB (Z-score) shows a wide standard deviation of 3.848, ranging from a minimum of 4.077 to a maximum of 15.109, indicating significant variation in bank stability ratings among the banks during the study. Additionally, the average financing risk and interest rate have standard deviations of 18.742 and 4.792, respectively, with values of 2.476 and 2.596. For more detailed descriptive data on the remaining variables, refer to Table 2.

	NEPSE	GDP(G)	INF	M2	BSTAB	FRISK	INT
Mean	755.163	4.297	6.575	70.951	9.412	18.742	4.792
Median	433.735	4.470	6.880	67.104	10.007	19.300	3.855
Maximum	2883.410	8.980	11.240	126.475	15.109	21.406	10.470
Minimum	163.350	-2.370	2.270	37.577	4.077	14.098	0.540
Std. Dev.	674.706	2.265	2.789	25.160	3.848	2.476	2.596
Skewness	1.443	-0.816	-0.060	0.715	-0.088	-0.615	0.704
Kurtosis	4.729	4.673	1.730	2.622	1.453	2.005	3.391
Jarque-Bera	13.207	6.375	1.899	2.555	2.792	2.923	2.483
Probability	0.081	0.071	0.387	0.279	0.248	0.232	0.785

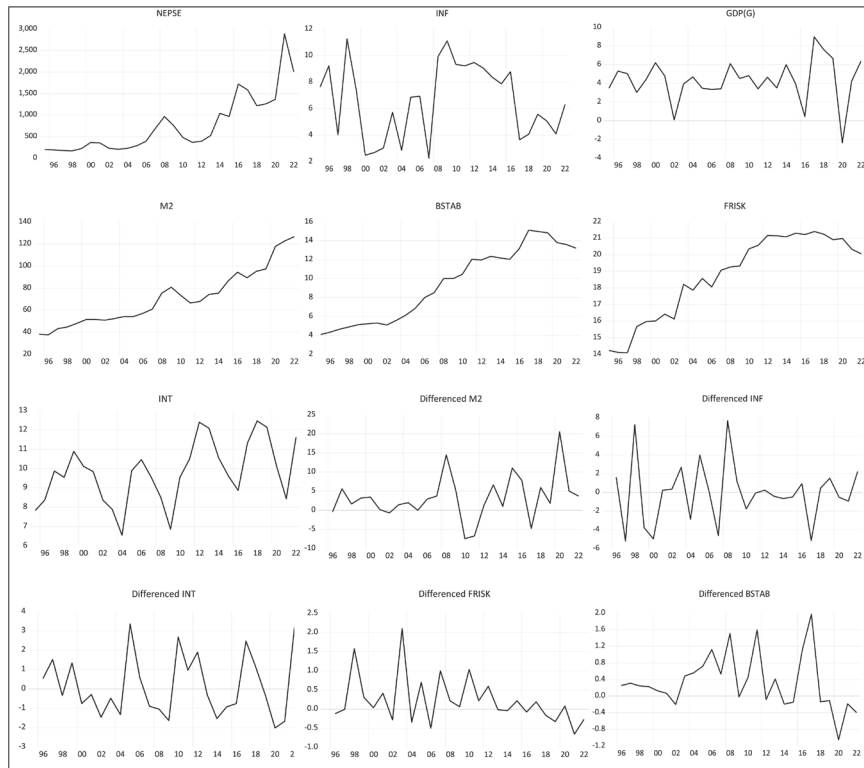
Sources: Derived from EViews 12 output.

**The stationarity tests**

This study employed unit root testing, specifically, the PP and ADF tests, conducted at both the level and first difference, presented in Table 3, to ascertain the integration order of the variables. According to the findings, all variables, except the GDP growth rate and interest rate, exhibit stationarity in the first difference at a significance level of 1%. This suggests that each variable can be classified as having an integration order of either I(0) or I(1).

Variables	P-value level		P-value at first difference		Order of integration
	Augmented Dickey-Fuller	Philips-Person	Augmented Dickey-Fuller	Philips-Person	
NEPSE	0.0079	0.2188	0.0030*	0.0038*	I(1)
GDP(G)	0.0003*	0.0002*	-	-	I(0)
INF	0.0081	0.0081	0.0000*	0.0000*	I(1)
M2	0.0588	0.3379	0.0014*	0.0014*	I(1)
FRISK	0.9961	0.9929	0.0000*	0.0000*	I(0)
BSTAB	0.9936	0.9793	0.0144*	0.0153*	I(1)
INT	0.0424**	0.0424**	-	-	I(0)

Sources: Derived from EViews 12 output.



**Fig.1: Movement of research variables at a level and first difference**



### Optimal lags selection and determinations

In Table 4, this study utilized AIC, HQ, and SBC criteria to examine the optimal lag length. This analysis aimed to identify the lag duration associated with lowest critical value for each criterion. According to the results in Table 4, lag 2 consistently displayed the lowest AIC, HQ, and BIC values among independent variables considered in the study. This suggests that a lag length of 2 was found to be the most suitable choice based on these criteria. The findings indicate the robustness of this specific lag duration in context of research variables. Therefore, this study validates whether the variables are co-integrated, and it is possible to employ bound tests for co-integration.

**Table 4: VAR lag order selection criteria**

Lag length	Akaike information criteria (AIC)	Schwarz information criterion (SC)	Hannan-Quinn information criterion (HQ)
0	48.56959	48.95669	48.68106
1	42.43814	45.92210	43.44140
2	37.91558*	44.49639*	39.81062*

Sources: Derived from EViews 12 output.

### Bound testing for co-integration analysis

In order to maintain a stable stock market index, it's vital to analyze relevant explanatory indicators. These indicators are typically derived through a causality test conducted after establishing a co-integration relationship among the variables. The ARDL method is well-suited for investigating causation between variables with integrated properties at both levels I(0) and I(1). This findings of this research demonstrate a consistent relationship among the variables, as evidenced by both co-integration test results and a significant F-statistics value of 10.2765. This suggests a robust and meaningful connection between the examined variables. For small sample sizes ( $n \leq 30$ ), this value surpasses the upper bound critical values of 3.656, 4.487, and 6.093 at significance levels of 10%, 5%, and 1% respectively. Therefore, this findings of this study confirm co-integration of the independent variables with the NEPSE index.

**Table 5: F-Bound Test**

Test Statistic	Value	Signif.	Finite Sample: n=30		Finite Sample: n≤30	
			I(0)	I(1)	I(0)	I(1)
F-statistic	10.27655	10%	2.277	3.498	2.296	3.656
k	6	5%	2.730	4.163	3.024	4.487
		1%	3.864	5.694	4.124	6.093

Sources: Derived from EViews 12 output.

This study used bound testing methodologies using ARDL model which was developed by Pesaran et al. (1999, 2001) to explore causal relationship between the independent variables and stock market index. These methods provided a framework for understanding how variations in the explanatory variables influence the NEPSE Index. By employing these approaches, the research aimed to discern the direction of causality, shedding light on the intricate dynamics between independent variables and the fluctuations in stock market index. The analytical approach enabled a comprehensive examination of the factors influencing changes in the NEPSE Index, contributing to a deeper understanding of market behavior.

### ARDL Long Run Form

In order to examine the persistent impacts of independent variables on NEPSE Index, this study confirmed variable co-integration and calculated long-run coefficients using ARDL model. Table 6 employs ARDL technique to illustrate the enduring relationship between explanatory variables and their impact on the NEPSE Index over the long term. This analysis provides valuable insights into the lasting influences of these variables on the behavior of the NEPSE Index.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	73.63920	18.98086	3.879656	0.0012
INF	-12.88606	7.721229	-1.668913	0.1261
M2	21.06661	7.757460	2.715658	0.0147
FRISK	-14.12322	6.684699	-2.112768	0.0608
BSTAB	73.63920	18.98086	3.879656	0.0012
INT	-60.16200	36.93384	-1.628913	0.1217
C	-259.4245	102.5676	-2.529304	0.0299

Sources: Derived from EViews 12 output.

Table 6 estimates long-run coefficient of explanatory variables on NEPSE Index by using the ARDL model. This positive and significant impact of GDP growth on the NEPSE Index suggests that a robust economic growth environment tends to drive stock market performance. When the economy is growing, it typically indicates increased business activities, higher corporate earnings, and improved investor sentiment. These factors contribute to an upward movement in stock prices and, investors can anticipate potential opportunities for capital appreciation in a growing economy. This finding aligns with the research conducted by Ghani et al., (2022), Ilahi et al., (2015), and Ho & Odhiambo, (2018).

Additionally, FRISK (funding risk) has a positive and significant impact NEPSE Index implying that an expansion in the money supply can stimulate stock market activity and drive index performance. An increase in M2 indicates more liquidity available in the economy, which can fuel investment activities, including stock market transactions. This enhanced liquidity often leads to increased demand for stocks, pushing up prices and positively impacting the NEPSE Index. These findings are supported by previous studies (Hsing, 2014; Megaravalli & Sampagnaro, 2018; Ghani et al., 2022). Bank stability (BSTAB) has a positive and significant impact on NEPSE Index signifies that a stable banking sector is conducive to a healthy stock market performance. Stable banks are better equipped to support economic growth, provide financing to businesses, and maintain liquidity in the market. These factors contribute to overall positive investor sentiment, attracting more investment capital to the stock market and positively influencing the NEPSE Index. This finding is consistent with Adusei, (2015), Pham et al., (2021), and Yensu et al., (2021).

Similarly, there is a negative and significant relationship between funding liquidity risk (FRISK) and the NEPSE Index, which implies that higher levels of risk associated with funding sources can adversely affect



stock market performance. Funding risk refers to the uncertainty and potential volatility in acquiring necessary funds for investment activities. When funding sources are unstable or face higher risks, investors may hesitate to invest in stock market, leading to reduced demand for stocks and downward pressure on stock prices. These results are similar to previous studies conducted by Yensu et al., (2021), Pham et al., (2021), and Adusei, (2015). Furthermore, the negative impact of the inflation rate on NEPSE Index should be explained by the eroding effect of inflation on purchasing power and investor confidence. As a result, high inflation can lead to increased borrowing costs, which can negatively affect businesses and their profitability, ultimately influencing stock market performance. This finding is similar to Megaravalli & Sampagnaro, (2018), Ghani et al., (2022), and Ilahi et al., (2015).

### **ARDL Error Correction Regression**

In Table 7, the short-term causality analysis findings reveal that error correction model (ECM) for time  $t-1$  stands at  $-0.8613$ , signifying a significant statistical relevance at the 1% level. This implies that any deviation from the long-term stability of banks is rectified at a substantial rate of 86.13% annually in the short term. The independent variables integrated into the analysis are responsible for explaining 86.13% of the preceding year's variance from the long-term NEPSE Index. The discrepancy observed between short-run and sustainable long-term NEPSE Index in Nepal provides insights into the financial system's vulnerability. This vulnerability is ascribed to the inefficiency in the flow of information within the financial framework over the short term, indicating potential challenges in maintaining stability and efficiency within the Nepalese financial system.

**Table 7: Estimated short-run coefficients by using ARDL(1, 1, 1, 2, 2, 1, 0, 0)**

ECM Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP)	85.29113	46.08402	1.850775	0.0871
D(INF)	-17.23034	9.158244	-1.881402	0.0825
D(M2)	19.20243	3.931949	4.883693	0.0006
D(FRISK)	-23.38472	4.549395	-5.140182	0.0004
D(BSTAB)	19.20243	12.15443	1.579871	0.1452
D(INT)	-5.335174	35.50915	-0.150248	0.8836
ECM(-1)*	-0.861358	0.070115	-12.28485	0.0000
Adjusted R-squared	0.702644		Durbin-Watson stat	2.144988
F-Statistic	32.32253		Prob. (F-statistic)	0.00000

Sources: Derived from EViews 12 output.

The Durbin-Watson (D/W) value of 2.1449 indicates absence of autocorrelation in the model, confirming the statistical integrity of the analysis. In Table 7, adjusted R<sup>2</sup> value of 0.70264 and the F-statistics value of 32.3225 (with a p-value of 0.0000) reinforce the model's appropriateness, meeting a significance level of

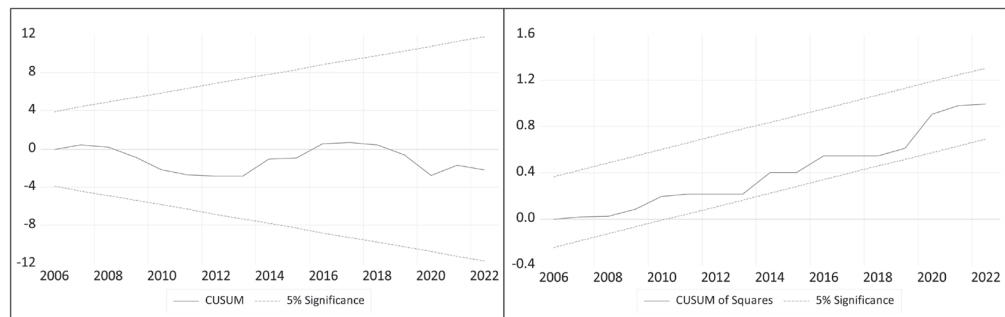
1%. Consequently, this study asserts that the employed sustainable NEPSE Index model is the most fitting. Additionally, the dynamic causality analysis of the ARDL model establishes significant relationships between the NEPSE Index and key independent variables such as GDP growth, board money supply (M2), bank stability (BSTAB), and funding risk (FRISK). These findings emphasize the substantial explanatory power of these variables in understanding the sustainable NEPSE Index, highlighting the positive short-term impact of GDP growth and money supply (M2) on the NEPSE index. However, funding risk (FRISK) shows negative significant effects on the NEPSE Index in short term.

**Diagnostic tests for the ARDL model**

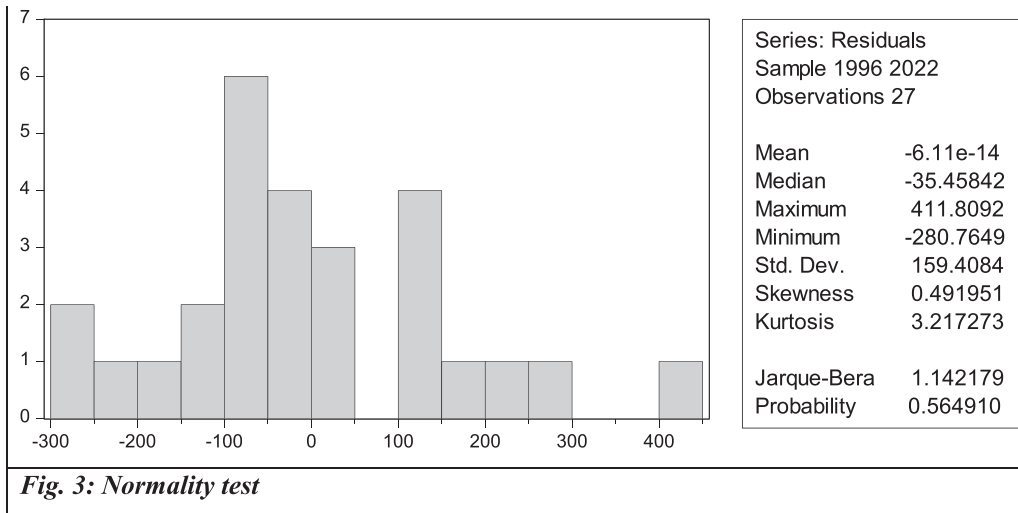
In this study, a comprehensive evaluation of the estimated ARDL approach's reliability was conducted through various diagnostic tests. The evaluation concentrated on important factors such as model stability, heteroscedasticity, normalcy, and serial correlation. In particular, the Jarque-Bera normalcy test, the recursive CUSUM test, the Breusch-Pagan-Godfrey (BPG) heteroscedasticity test, and the Breusch-Godfrey (BG) serial correlation LM test were employed. Table 8 presents the results of the tests for serial correlation and heteroscedasticity, which provide light on the model's statistical characteristics. Furthermore, the CUSUM test results are graphically represented in Figures 2 and 3, which show the model's normalcy and stability. The purpose of these thorough tests was to confirm the robustness, reaffirming, and reliability of the ARDL model and to uphold the methodological integrity of the research.

**Table 7: Diagnostic tests for the ARDL approach**

	F-version		BP Godfrey LM-version	
	Statistics	P-Value	Statistics	P-Value.
A: Serial Correlation	F (2,15) = 0.463011	0.5549	$\chi^2 (2) = 0.56661$	0.5205
B: Heteroscedasticity	F (9,17) = 1.587435	0.1969	$\chi^2 (9) = 12.32933$	0.1954
C: Normality	<b>Jarque-Bera</b>		1.142179	0.5649



**Fig. 2: CUSUM & CUSUM square stability test**



Sources: Derived from EViews 12 output.

The results displayed in Table 8 provide strong evidence that both serial correlation and heteroscedasticity do not impact the ARDL method employed in this study. This conclusion is supported by F-statistics and Chi-Square p-values exceeding 0.05. Furthermore, a thorough assessment of the normality of the residual terms, as demonstrated in Table 8 and Figure 3, revealed a Jarque-Bera test statistic of 1.14217 (with a p-value of  $0.5649 > 0.05$ ), indicating that the residuals conform to a normal distribution. These findings affirm the overall credibility and robustness of the research, underscoring the statistical integrity and reliability of the ARDL technique implemented.

The CUSUM test and CUSUM square stability test were used in the study to verify the model's long-term stability. The CUSUM and CUSUM of the square test plots are shown beside the crucial boundary line set at a 5% significance level in Figure 2, which presents the test findings. Notably, Figure 2 illustrates that both plots consistently remain within the specified boundaries throughout the study. This consistent adherence to the critical boundaries affirms stability of model over the entire duration of the study. Consequently, the model's stability has been robustly established, validating its reliability and suitability for analyzing causality and long-term relationships in the context of the study's objectives.

#### IV. Conclusions and implications

This study examined the determinants of a sustainable stock market index in Nepal using ARDL Model estimation. The study reveals that GDP growth, board money supply (M2), and bank stability (BSTAB) have a statistically significant and positive effect on the NEPSE Index. These variables provide insights into the macroeconomic conditions and financial sector stability that can impact stock market returns. Therefore, this study suggests that policymakers and regulators should focus on fostering a favorable economic environment with sustainable GDP growth, appropriate monetary policies, and robust banking regulations to promote a healthy stock market and support investor confidence. Market participants can analyze the interplay between these variables and the NEPSE Index to identify investment opportunities and develop investment strategies accordingly.

Similarly, this study also found that inflation and funding risk (FRISK) have a negative and significant impact on the NEPSE Index. These variables provide important insights into the risk-return dynamics of the stock market and can help investors manage their portfolios and expectations accordingly. This study suggests that policymakers and central banks should carefully monitor and manage inflation rates, funding risks, and interest rates to maintain a stable and conducive environment for stock market investments. Implementing appropriate monetary policies and regulatory measures can help mitigate the negative impacts of these variables on stock market performance. Diversification and risk management techniques can be employed to mitigate the adverse effects of these variables on the performance of their stock market portfolios. Policymakers and regulators should utilize these insights to develop and implement effective strategies that support a thriving stock market and ensure long-term investor confidence.

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