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Stock Market Development and Economic Growth of Nepal

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Abstract

The development of Nepal's stock market and economic growth are examined in this study since several factors, including stock market development, affect economic growth. The stock market development indicators are market capitalisation, trading turnover, NEPSE index, gross capital formation, and gross national savings. This research is based on secondary data (1995 to 2022) extracted from the Quarterly Economic Bulletin of Nepal Rastra Bank in mid-July 2023. The econometric methods such as the Johnson cointegration test, Granger causality test, and VAR model were used to assess the nexus between the stock market development and economic growth in Nepal. Long-term cointegration has been observed between the stock market development indicators such as gross national savings, market capitalisation, gross capital formation, trading turnover, stock market index, and economic growth. Likewise, economic growth and stock market development are shown to be causally related in a unidirectional manner by the Granger causality test. It concludes that stock market development matters for economic growth in the short and long run. The regulatory authority may adopt an appropriate policy for sustained growth of the stock market through (i) improving disclosure and transparency, (ii) enhancing investor awareness and education, (iii) safeguarding the interest of shareholders, (iv) diversifying the trading opportunities, and (v) maintaining the macroeconomic stability.

INTRODUCTION AND STUDY OBJECTIVES

The government and policymakers have a growing concern for the stability of the stock market. The Nepalese stock market is more volatile and underdeveloped (Joshi, 2018; Ghimire, 2022; Panta, 2020) due to various reasons such as low investor awareness, manipulation and insider trading, inadequate regulatory framework and infrastructure,

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and political instability (Aggarwal & Wu, 2006; Dhungana, 2013; Karmacharya, 2023; Mainali, 2011). The stable and developed stock market expands market capitalisation and integrates the global market (Goetzmann et al., 2001; Pan & Mishra, 2018; Rousseau & Wachtel, 2000). Stock market diversification is required in Nepal, which may provide wider investment opportunities and attract investors in various areas such as equity, bonds, commodities, and other securities (Adhikari, 2013; Koirala & Bajracharya, 2004).

The strength of financial institutions is a crucial factor in the development of most economies, whether developed or developing (Fergusson, 2006; Levine, 1997). Stock markets have grown and experienced significant global market booms (Billmeier & Massa, 2009; Western, 2020). The focus on stock markets as a catalyst of financial development and economic expansion has grown significantly in the modern era (Hassan et al., 2011; Levine, 1997). Economic growth is significantly impacted by stock market development. The evolution of the economy and the stock market are in stable, long-term equilibrium with one another (Masoud & Hardaker, 2012). Government consumption and instability in macroeconomics have a negative impact on economic growth (Ngare et al., 2014; Sanchez-Robles, 1998).

Monetary and fiscal policy, GDP growth rate, rate of inflation, and money supply are examples of macroeconomic variables that impact a nation's economic growth (Timilsina, 2001). The stock market provides information for potential investments, gathers and mobilises savings, promotes liquidity, and distributes capital among the economy's many sectors (Dabwor et al., 2022; Khoutem et al., 2014; Levine, 1997; Thaddeus et al., 2022). An active, strong, and stable stock market can accelerate economic growth (Nowbutsing & Odit, 2009; Qamruzzaman & Wei, 2018). Politically stable and less corrupt nations typically have more significant economic growth (Mo, 2001; Ngare et al., 2014). Significant and more liquid markets are typically associated with globally recognised accounting principles, strong information disclosure regulations, and unrestricted foreign capital movements (Demirgüç-Kunt & Levine, 1996).

The purpose of this study is to investigate Nepal's economic growth and stock market development. This research has used econometric approaches based on secondary data to assess whether there is short-term or long-term causality between GDP and the indicators of stock market development. This research will be helpful to the policymakers and government to maintain the stock market stability for the sustained economic growth of developing countries like Nepal.

LITERATURE REVIEW

Neo-classical economics is the most popular theory for interpreting how financial markets behave in unpredictable situations (Fromlet, 2001). The fundamental profit maximisation theory should guide rational market

participants in their investment decisions (Lee, 2004; Simon, 1979). Businesses should only exist to maximise the wealth of their investors, according to the stockholder theory (Jensen, 2010). However, as many supporters of the stakeholder approach would argue, corporate ethics is about more than just making money (Castelo Branco & Lima Rodriques, 2007; Jamali, 2008; Windsor, 2006). Businesses must consider the interests of all parties involved in the firm (Goodstein & Wicks, 2007). Developing and managing business models aims to provide value for various stakeholders (Attanasio et al., 2022; Dembek et al., 2018; Freudenreich et al., 2020).

If a capital market accurately and completely considers all relevant information when setting securities prices, it is considered efficient (Holland, 1998). Eugene Fama established the critical theory known as the efficient market hypothesis (EMH), which distinguishes between three types of efficiency: weak, semi-strong, and strong. The EMH claims that the financial markets exhibit real-time reflection of all pertinent information (Timmermann & Granger, 2004). Prices are assumed to consider all available information on a market in the strong form of EMH (Clarke et al., 2001; Naseer & Bin Tariq, 2016). It includes all new public information, all private information about a financial asset, and previous financial information (Khairajani, 2023; Ţiţan, 2015). Thus, efficiency in the stock market is the degree to which stock prices effectively reflect public or private information (Mobarek et al., 2008).

As per the semi-strong form of EMH, all publicly available information about a company's securities is reflected in current stock prices, in addition to previous price information (Malkiel, 1989; Ţiţan, 2015). If markets are efficient, then abnormal economic profits cannot be made by applying the fundamental analysis technique to examine balance sheets, income statements, announcements of stock splits or changes in dividends, or any other publicly available information about a company (Abarbanell & Bushee, 1998; Malkiel, 1989). The EMH, in its weak form, states that prices accurately represent the information found in the historical price sequence (Clarke et al., 2001; Malkiel, 1989). As a result, investors cannot use technical analysis, a method of analysing historical price trends, to create an investment plan that would provide abnormal returns. The 'Random Walk Hypothesis' is linked to this type of efficiency (Azad, 2009; Maiti, 2021; Malkiel, 1989).

Behavioural finance is the study of how people, organisations, and corporations make financial decisions and how these decisions are influenced by psychological and social factors (Baker & Nofsinger, 2010). The psychology of investors and its influence on financial decision-making is related to behavioural finance (Kapoor & Prosad, 2017; Nofsinger, 2005). Behavioural finance research has covered numerous cognitive and psychological biases that can affect investment decisions (Burton & Shah, 2013; Dhungana et al., 2022; Kumar & Goyal, 2015). Investment decisions are heavily influenced by the price of the stock, client

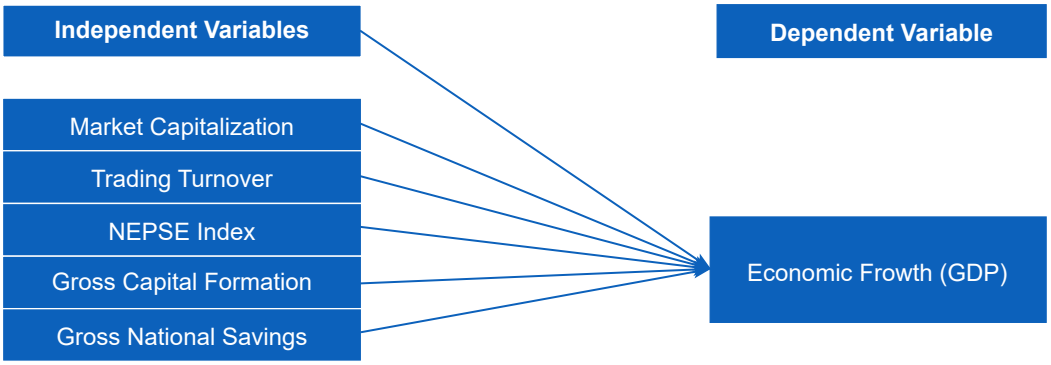

Figure 1. *Conceptual Framework for Stock Market Development and Economic Growth*
Note. Based on the literature review.

preferences, historical stock movements, and secondary market information (Daniel et al., 2002; Dhungana et al., 2023; Nagy & Obenberger, 1994). Investor decision-making and performance are influenced mainly by behavioural factors (Dhungana, 2018; Khawaja & Alharbi, 2021; Rasheed et al., 2018).

Economic growth cannot be achieved without financial development (Appiah et al., 2022; Dhungana, 2014; Khan, 2001; Levine, 1997; Shahbaz et al., 2022). For countries classified as upper-middle-income economies, the development of the stock market has a significant beneficial influence on economic growth (Adjasi & Biekpe, 2006). The growth of the stock market granger impacts economic expansion in South Africa and Egypt (Enisan & Olufisayo, 2009). Long-term economic expansion can be supported by a robust stock market (Caporale et al., 2004; Paramati & Gupta, 2011; Saleem et al., 2021). Market capitalisation and the total number of stocks traded show positive correlations with economic growth (Quaidoo, 2011; Setiawan et al., 2021). The Granger-causality test results show that stock market capitalisation follows economic growth (Jalloh, 2015; Quaidoo, 2011; Raza & Jawaid, 2014; Zhongming et al., 2018).

There is a long-term, unidirectional causal relationship between economic growth and the stock market development index. The stock market's size and liquidity are significant indicators of its capacity to raise capital, diversify risks, and facilitate stock trading (Bhattarai et al., 2021). Savings are efficiently mobilised through financial markets. Stock markets provide an environment where investors are willing to give up control over their savings (Nieuwerburgh et al., 2006). The development of financial intermediaries, saving rates, real income, and liquidity of the stock market are significant factors that influence stock market capitalisation (Garcia & Liu, 1999). Gross fixed capital formation positively correlates with stock market capitalisation (Ayadi & Williams, 2023). Economic growth is significantly correlated with capital formation and national savings (Akinola & Omolade, 2013; Nweke et al., 2017).

Table 1
Descriptions of Variables

Name of Variable	Acronyms	Variables Details
Gross domestic product	GDP	Measures economic growth, used as a growth rate and as a dependent variable.
Market capitalisation	MC	Measures as a total market value of all outstanding shares. It is reflected as a percent of GDP.
Trading turnover	TT	Measures the liquidity of a stock market. Reflected as a growth rate.
NEPSE index	Index	Measures the overall stock market growth.
Gross capital formation	GCF	Measures the investments made on expanding the economy's fixed assets and net adjustments to the inventories. Reflected as a percent of GDP.
Gross national savings	GNS	Measures as the difference between gross national income and total consumption. It is reflected as a percent of GDP.

Stock markets increase the range of economic tools accessible to depositors to expand their portfolios, which helps to mobilise domestic savings (Vazakidis & Adamopoulos, 2009).

Several empirical evidence shows economic growth is influenced by the various indicators of stock market development including trading turnover, market capitalisation, and index (Garcia & Liu, 1999; Raza & Jawaid, 2014; Setiawan et al., 2021). However, limited studies are on the effects of gross capital formation (Ayadi & Williams, 2023) and gross national savi ngs (Akinola & Omolade, 2013; Nweke et al., 2017) related to stock market development. This study has captured key indicators of stock market development including gross national savings and gross capital formation in the context of Nepal. The following conceptual framework has been established to evaluate the development of the stock market and economic growth based on the literature:

RESEARCH METHODS

The NEPSE index, gross capital formation, market capitalisation, trading turnover, and gross national savings are the stock market development indicators. The secondary data used in this study was taken from Nepal Rastra Bank's Quarterly Economic Bulletin in mid-July 2023. This study includes the data from the years 1995 to 2022 based on the accessibility of the data. Table 1 shows the details of each variable with abbreviation and explanation.

The relationship between the expansion of the stock market and Nepal's economic growth was examined using econometric investigation using the Johnson cointegration test, Granger causality test, and VAR model. Additionally, the study verified the validity of each assumption made in the model. The association between stock market development and economic growth has been evaluated using the following hypotheses:

H1 : The stock market development indicators and GDP have a short-term causal relationship.

H2 : The stock market development indicators and GDP have a long-term causal relationship.

DATA ANALYSIS AND DISCUSSIONS

For time series data, stationarity is essential (Leybourne et al., 1996). Table 2 reveals the summary of the unit root test.

GDP, TT, and Index are displayed in Table 2 at level I (0) when the P-value is significant at a 1% significance level. As shown by I (1), the remaining independent variables, MC, GCF, and GNS, become stationary following the first differences and are not significant at level I(0).

Granger (1969) developed an organised method to investigate the relationship of causation between variables. Table 3 presents the results of the Granger causality test for pairs.

Table 3 shows no bidirectional causality between GDP and other independent variables related to stock market development. However, there is unidirectional causality from GDP to MC and Index, GCF to MC, GNS to MC, Index to TT, and GNS to Index. The study finds that GDP ganger causes market capitalisation and the NEPSE index. Likewise, the gross capital formation granger causes market capitalisation, the gross national savings granger causes market capitalisation and the NEPSE

Table 2
Unit Root Tests and Its Summary

Name of Variables	Original Level	Differences at First Level	Form of Integration
GDP	-5.4626 (0.0008***)	-	I (0)
MC	2.4843 (0.3734)	-7.3098 (0.0000***)	I (1)
TT	-7.0318 (0.0000) ***	----------	I (0)
Index	-5.8908 (0.0005) ***	----------	I (0)
GCF	-3.5346 (0.0556)	-7.1608 (0.0000) ***	I (1)
GNS	-0.9914 (0.9287) ***	-6.5831 (0.0001) ***	I (1)

Note. Author's computation based on Version 10 of EViews software.
**** indicates a significance level of 1 percent. Here, Lag at 6.*

Table 3
Test of Pairwise Granger Causality

Null Hypotheses:	Obs.	F-Statistic	P-value
MC does not granger cause GDP.	24	1.78555	0.1881
GDP does not granger cause MC.		7.98307	0.0015***
TT does not granger cause GDP.	25	0.91227	0.4547
GDP does not granger cause TT.		0.73856	0.5427
INDEX does not granger cause GDP.	25	1.91747	0.1629
GDP does not granger cause INDEX.		6.01476	0.0050***
GCF does not granger cause GDP.	24	0.20462	0.8918
GDP does not granger cause GCF.		2.09792	0.1384
GNS does not granger cause GDP.	24	0.55537	0.6515
GDP does not granger cause GNS.		1.34707	0.2924
TT does not granger cause MC.	24	1.15228	0.3567
MC does not granger cause TT.		2.31841	0.1119
INDEX does not granger cause MC.	24	0.43027	0.7340
MC does not granger cause INDEX.		1.03755	0.4011
GCF does not granger cause MC.	24	3.72641	0.0317***
MC does not granger cause GCF.		0.21576	0.8841
GNS does not granger cause MC.	24	4.34625	0.0191***
MC does not granger cause GNS.		0.58938	0.6303
INDEX does not granger cause TT.	25	3.73311	0.0302***
TT does not granger cause INDEX.		0.75249	0.5351
GCF does not granger cause TT.	24	1.21345	0.3351
TT does not granger cause GCF.		0.93660	0.4447
GNS does not granger cause TT.	24	0.92675	0.4491
TT does not granger cause GNS.		0.34725	0.7916
GCF does not granger cause INDEX.	24	1.82259	0.1813
INDEX does not granger cause GCF.		0.70022	0.5648
GNS does not granger cause INDEX.	24	4.35590	0.0189***
INDEX does not granger cause GNS.		0.27504	0.8426
GNS does not granger cause GCF.	24	0.24826	0.8614
GCF does not granger cause GNS.		0.89715	0.4629

Note. Author's computation based on Version 10 of EViews software.
*** indicates a significance level of five percent and *** indicates a significance level of one percent. Here, Lag at 3*
The sample includes the years 1995 to 2022.

Table 4
Johnson Cointegration Test
Series: GDP MC TT INDEX GCF GNS

Hypothesised	Trace Statistics	P-value	Max-Eigen	P-value
None	156.8861	0.0000***	73.81811	0.0000***
At most 1	83.06804	0.0030***	39.44295	0.0098***
At most 2	43.62509	0.1181	24.05286	0.1329
At most 3	19.57223	0.4523	11.22724	0.6246
At most 4	8.344991	0.4293	5.878176	0.6289
At most 5	2.466816	0.1163	2 .466816	0.1163

Note. Author's computation based on Version 10 of EViews software.
** Probabilities are calculated using the asymptotic Chi-square distribution.*
*** indicates a significance level of five percent and *** indicates a significance level of one percent.*
The sample includes the years 1995 to 2022.
The sample includes the years 1995 to 2022 with 26 observations and a linear deterministic trend model.

index, and the NEPSE index granger causes trading turnover in the Nepalese stock market. Economic growth and stock market development are causally related in a unidirectional way (Dritsaki & Dritsaki-Bargiota, 2005; Islam et al., 2023; Pradhan et al., 2014). This result is consistent with other research works and the reasons may be the similarity of the contextual scenario.

Enders and Siklos (2001) state that a cointegration test was employed to determine a long-term correlation between distinct time series. The Johnson cointegration test can be found in Table 4.

According to Table 4, based on the maximum Eigenvalue statistic and trace statistics, there are a maximum of two cointegrating equations among the study variables at the 5% level. Based on the test, we estimate the error correction coefficients using the VECM approach since the cointegrated time series data are assumed to have a long-term adjustment process represented by an error-correction representation.

Vector Error Correction Model (VECM)

Every variable has cointegration. As a result, it has been established whether or not there is a long-term link utilising the VECM model (standard VAR). The following equation has been created to compute VECM:

D(GDP) = C(1)*(GDP(-1)
+0.289059255386*DMC(-1)
-0.0319656144938*TT(-1)
-0.0666507832131* INDEX(-1)
+0.99873092178*DGCF(-1)
+0.480650900774*DGNS(-1)
-5.5419103568) + C(2)*D(GDP(-1))
+ C(3)*D(DMC(-1)) + C(4)*D(TT(-1)) +
C(5)*D(INDEX(-1)) + C(6)*D(DGCF(-1))
+ C(7)*D(DGNS(-1)) + C(8)

As can be seen from the appendix, the model's p-value is significant, and

Table 5.
Statistics of the Wald Test

Test Statistic	Value	df	P-value
Chi-square	12.6585	5	0.0268

Note. Author's computation based on Version 10 of EViews software.

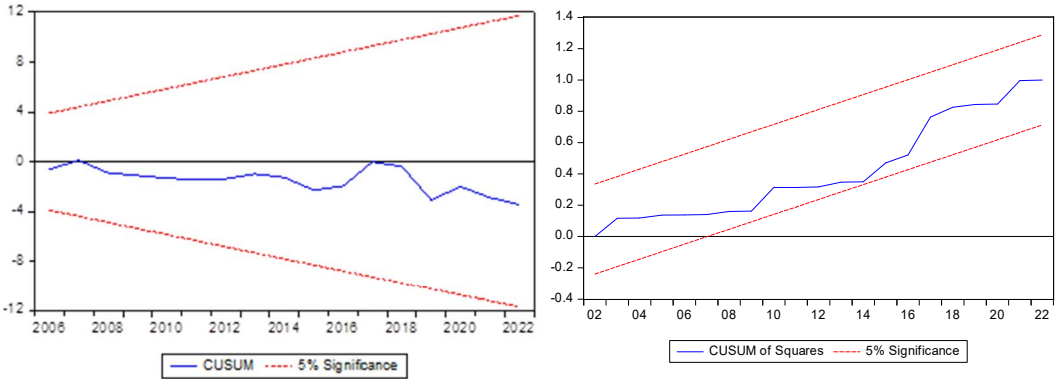

Figure 2. *Model's Stability Test*
Note. Author's computation based on Version 10 of EViews software.

the coefficient is negative. A long-term correlation has been observed between GDP and MC, TT, INDEX, GCF, and GNS. The stock market development (capitalisation, trading turnover, stock market index (NEPSE), gross national savings, and gross capital formation) and economic growth have long-run cointegration. This finding is consistent with other researchers such as (Dabwor et al., 2022; Enisan & Olufisayo, 2009; Erdem et al., 2010; Shahbaz et al., 2008). The reason behind the consistency may be the similarity of the contextual scenario.

Furthermore, the combined short-term effects of the independent variables on the dependent ones have been computed using the Wald test statistics. If the null hypothesis is true, short-term causation between the independent and dependent variables does not exist. It has been suggested that the following null hypotheses apply to short-term relationships:

The null assumption is that C (3) = C(4) = C(5) = C(6) = C(7) = C(8) = 0.

Table 5 shows the Wald test statistical results.

There is a short-run causal association between GDP and other independent stock market development variables, as demonstrated by Table 5, which rejects the null hypothesis. GDP shocks appear to have a more substantial effect on the stock markets in the short run (Yunus, 2023).

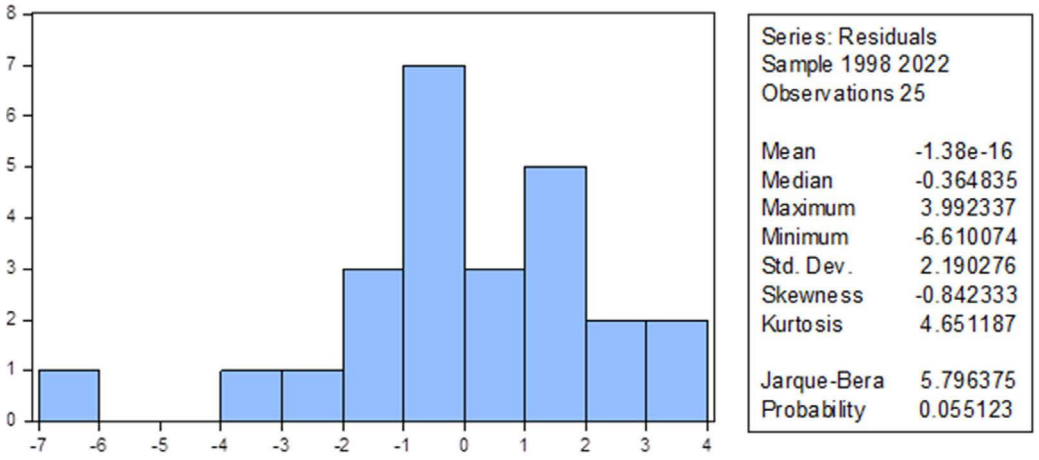

Figure 3. *Model's Normality Test*
Note. Author's computation based on Version 10 of EViews software.

Figure 2 displays the test results for the stability of the model using the CUSUM and CUSUM of Squares tests.

It is clear that the curve line, which is shown in the figures as blue, is located between two red lines. If, at a 5% significance level, the blue line is contained between two red lines, the model is stable.

Diagnostic Test of Residuals

To proceed with the further validation of the model, the residual must not have serial correlation, be normally distributed, and be homoscedastic. Below is the fundamental idea of the regression model.

If the residuals are not normally distributed, the model's outputs violate the central limit theorem's assumption. The normality of the model has been evaluated using the Jarque-Bera test (Akanbi et al., 2020). The normalcy test results for the model are displayed in Figure 3.

The normality test findings, which are used to assess whether or not the residual from the model is normally distributed, are displayed in Figure 3. The null hypothesis was not rejected, as indicated by the p-value of 0.0551 and the Jarque-Bera statistics of 5.7963. It suggests that residuals have a normal distribution, which verifies the assumption of the model.

The homoscedasticity hypothesis has been confirmed using the Breush Pegan test. For the model to be more accurate, the residual has to be homoscedastic. There is sufficient data to determine that the residuals are homoscedastic if the probability value is higher than 5% (Akanbi et al., 2020).

Table 6 exhibits that the p-value is greater than the significance level of 5%, indicating that the null hypothesis can be accepted. The model's assumption is supported by the evidence that the residuals lack autocorrelation and serial

Table 6
Tests of Breusch-Pagan

Tests	Statistic	P-value
Breusch-Godfrey Serial Correlation LM	1.9069	0.1829
Breusch-Pagan Godfrety	0.6752	0.7467
Autocorrelation	5.7279	0.9290

Note. Author's computation based on Version 10 of EViews software.

correlation and are homoscedastic (Lenka & Bairwa, 2016).

The expansion of the banking system, private capital flows, domestic investment, income level, and stock market liquidity are all significant factors in determining the stock market's growth (Abdelbaki, 2013). Institutional and macroeconomic and factors affect stock market growth (Rehman, 2021; Yartey, 2010). Larger stock markets have higher global integration, lower volatility, and higher liquidity than smaller ones (Demirgüç-Kunt & Levine, 1996). The stock market's increased volatility can impede investment and growth (Demirgüç-Kunt & Levine, 1996; Fakhfekh et al., 2023; Wen et al., 2021). An increasing stock market may favourably impact economic expansion (Arestis et al., 2001; Chikwira & Mohammed, 2023; Kithandi et al., 2023). Stock market development is a result of economic progress (Enisan & Olufisayo, 2009; Quaidoo, 2011), and stock markets stimulate economic development (Chikwira & Mohammed, 2023; Enisan & Olufisayo, 2009; Pradhan et al., 2019).

Many empirical studies found that economic development and stable market growth positively correlate (Adjasi & Biekpe, 2006; Levine & Zervos, 1996; Ngare et al., 2014). Stock market development predicted economic expansion more accurately than bank-based development (Nieuwerburgh et al., 2006). Countries with stock markets often grow at a faster rate than those without (Ngare et al., 2014; Singh, 1997). Economic growth and stock market development are correlated in both directions (Bist, 2017; Enisan & Olufisayo, 2009). The stock market growth and economic expansion have long-run cointegration (Dabwor et al., 2022; Enisan & Olufisayo, 2009; Erdem et al., 2010). However, there is no indication that the stock market and the real economy are correlated in the short run (Pan & Mishra, 2018).

CONCLUSION AND IMPLICATIONS

Economic expansion is affected by several factors, including stock market advancement. Long-term cointegration has been observed between economic growth and stock market development indicators such as gross national savings, market capitalisation, trading turnover, stock market index, and gross capital formation. Likewise, economic growth and stock market development

are shown to be causally related in a unidirectional manner by the Granger causality test. A short-term causal association between GDP and other independent stock market development variables is demonstrated by the Wald test statistics. It can be concluded that stock market advancement matters for economic expansion in the short and long run. Sound macroeconomic and regulatory policies are required to advance the stock market development in Nepal. The regulatory authority may adopt an appropriate policy for sustained growth of the stock market through (i) improving disclosure and transparency, (ii) enhancing investor awareness and education, (iii) safeguarding the interest of shareholders, (iv) diversifying the trading opportunities, and (v) maintaining the macroeconomic stability.

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Conflict of interest
The author has declared to have no conflicts of interest in the study.

Declaration
The author has confirmed the originality of this study and declared to have followed the research ethics and norms

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Appendix 1

Least Squares Method

Coefficient	Error	Std. Error	t-Statistic	P-value
C(1)	-0.392748	0.114510	-3.429824	0.0032
C(2)	0.486517	0.333180	1.460226	0.1625
C(3)	0.0 71477	0.037299	1.916341	0.0723
C(4)	-0.001352	0.005258	-0.257172	0.8001
C(5)	-0.046258	0.020568	-2.248999	0.0381
C(6)	0.266329	0.119622	2.226424	0.0398
C(7)	-0.284953	0.171331	-1.663178	0.1146
C(8)	-0.106699	0.534293	-0.199701	0.8441

R-squared	0.612697	Mean dependent var	0.040395
Adjusted R-squared	0.453219	S.D. dependent var	3.519438
S.E. of regression	2.602435	Akaike info criterion	5.005110
Sum squared resid	115.1354	Schwarz criterion	5.395150
Log likelihood	-54.56387	Hannan-Quinn criter.	5.113290
F-statistic	3.841897	Durbin-Watson stat	2.164854
Prob(F-statistic)	0.011017		

Equation: D(GDP) = C(1)*(GDP(-1) + 0.289059255386*DMC(-1) - 0.0319656144938*TT (-1) - 0.0666507832131*INDEX(-1) + 0.99873092178*DGCF(-1) + 0.480650900774*DGNS(-1) - 5.5419103568) + C(2)*D(GDP(-1)) + C(3)*D(DMC(-1)) + C(4)*D(TT(-1)) + C(5)*D(INDEX(-1)) +C(6)*D(DGCF(-1)) + C(7)*D(DGNS(-1)) + C(8)

Note. Author's calculation using reviews software Version 10