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### Assessing the Contributing Role of Financial Development Indicators in Nepalese Economic Growth

评估金融发展指标对尼泊尔经济增长的贡献作用

Pitambar Lamichhane<sup>1</sup> , Bashu Dev Dhungel<sup>2\*</sup>, Purna Man Shrestha<sup>3</sup>

<sup>1</sup>*Faculty of Management, Tribhuvan University*

<sup>2</sup>*Department of Economics, Ratna Rajyalaxmi Campus, Tribhuvan University, Nepal*

<sup>3</sup>*Graduate School of Management, Mid-West University, Nepal*

\*Correspondence Author: [bashu.1dhungel@gmail.com](mailto:bashu.1dhungel@gmail.com)

#### Abstract:

The purpose of this research is to examine the impact of financial development indicators, broad money supply, bank liabilities and bank credit to the private sector on economic growth. This study assesses the causal relationship between financial development (FD) indicators and economic growth in Nepal.

**Methodology:** This study applies a descriptive and causality research design for investigating the nexus between FD and the economic growth rate (GDP). The GDP growth rate is used as a dependent variable and FD indicators broad money supply to GDP, bank credit to private sector to GDP and total bank liabilities to GDP are considered as explanatory variables. This research uses Johansen cointegration, Granger causality, and vector error correction models for assessing both the short-run and long-run causal relationship between FD indicators and economic growth in

#### Keywords:

Bank credit to the private sector, bank liabilities, broad money supply, economic growth, financial development.

**关键词:** 银行对私营部门的信贷、银行负债、广义货币供应量、经济增长、金融发展

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Nepal.

**Main Findings:** The Johansen cointegration test reveals long-run cointegration among the variables. In addition, the Granger causality test confirms the bi-directional causality between FD indicators and economic growth in Nepal. Finally, the result of the vector error correction term represents a significant level of short-term alteration toward long-term stability, which concludes both short- and stable long-run contributing role of financial development indicators in economic growth.

**Applications:** The focus of financial development for economic growth is a national priority of Nepal and is of great interest to researchers.

**Novelty/Originality:** The examination of the causal relationship between financial development and economic growth is the novelty of this study in the context of Nepal. Therefore, policy makers are suggested to formulate and implement various policies to develop a strong financial system for rapid economic growth in Nepal.

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**摘要：**

**研究目的：**

本研究旨在考察金融发展指标、广义货币供应量、银行负债以及银行对私营部门的信贷对经济增长的影响。本研究评估了尼泊尔金融发展（FD）指标与经济增长之间的因果关系。

**研究方法：**

本研究采用描述性和因果关系研究设计，探讨金融发展与经济增长率（GDP）之间的关系。GDP 增长率作为因变量，FD 指标广义货币供应量与 GDP 之比、银行对私营部门的信贷与 GDP 之比以及银行总负债与 GDP 之比作为解释变量。本研究采用约翰森协整模型、格兰杰因果关系模型和向量误差修正模型，评估尼泊尔金融发展指标与经济增长之间的短期和长期因果关系。

**主要发现：**

约翰森协整检验揭示了变量之间的长期协整关系。此外，格兰杰因果关系检验证实了金融发展指标与尼泊尔经济增长之间的双向因果关系。最后，向量误差修正项的结果显示出短期向长期稳定的显著变化，这说明金融发展指标对经济增长既具有短期贡献，也具有长期稳定贡献。

**应用价值：**

金融发展对经济增长的侧重点是尼泊尔的国家优先事项，并受到研究人员的广泛关注。

**创新性/独创性：**

本研究在尼泊尔背景下考察金融发展与经济增长之间的因果关系是其创新之处。因此，建议政策制定者制定和实施各种政策，以建立强大的金融体系，从而促进尼泊尔经济的快速增长。

## 1. Introduction

Financial development (FD) is a key factor in accelerating economic growth because financial activities help accelerate economic activities by mobilizing idle resources toward the productive sector (King and Levine, 1993; Greenwood and Smith, 1997). The nexus between FD and economic growth is an extensive area of study. The financial system plays an

intermediate role between that of lenders and borrowers, reducing information and transaction costs. The developed financial system bridges the gap between present and future capital for economic growth. FD is a prerequisite for mobilizing savings into the production sectors for economic growth in both developed and developing economies.

FD is the process of improving the quantity, quality, and efficiency of financial services of financial institutions and markets. The functioning of financial markets and intermediaries is the foundation of economic development. FD is the process of financial innovation, the institutional improvement of the financial system to reduce asymmetric and information costs, increase competitiveness, expand the possibilities of financial transactions via contracts, lower transaction costs, and increase competition (Hartman and Heider, 2007).

A well-developed financial system reduces the costs of information, monitoring, and transactions, which enhances the efficiency of financial intermediations and accelerates economic development (Cherif and Gazdar, 2010). Therefore, FD has a significant role in improving production activities and efficiency, developing capital through mobilization of public savings, and developing financial institutions as well as capital markets that accelerate economic development. FD has a significant role in the allocation of resources, diversification of investment, rise of liquidity, minimization of risk, increasing efficiency, fostering knowledge to use advanced technology, etc., to accelerate rapid economic growth (Wu et al., 2010).

FD is the key driver of a nation's innovation and economic development of a nation (Schumpeter, 2011). FD affects economic growth via (i) raising the productivity of capital by collecting information, evaluating various alternative projects, and minimizing risk; (ii) raising savings channeled to investment via FD; and (iii) encouraging more private savings. FD promotes investment via funding for business opportunities with the mobilization of savings, monitoring of managers' performance, diversifying risk, and enabling the trade of products. These results help better resource allocation, accumulation of physical and human resources, and adoption of advanced technology that contributes to the rapid economic growth of any nation.

FD and economic growth have a favorable association, and there is a strong link between them (Eren et al., 2019). Paudel and Acharya (2020) revealed a significant contribution of financial variables to economic growth and suggested that policymakers use foreign direct investment (FDI) and create an investment-friendly environment to attract a large amount of FDI into Nepal to accelerate rapid economic growth. FD, as credit to the private sector, encourages the promotion of bank deposits that accelerate economic growth in the long run (Chiwira, 2023).

The literature shows a significant contribution of FD to accelerating the economic growth of developed and developing economies. However, the nexus between financial development indicators and their contribution to economic growth is a more debatable issue. However, financial variables play a significant role in encouraging investments in projects and business activities, generating employment opportunities, and promoting

and accelerating economic activities that simultaneously solve the problems of capital investment in the nation.

The effects of various financial factors on Nepal's economic development are still indistinct. Nepal is facing the problem of insufficient capital formulation for investment in various sectors because of the lack of FD and inability to attain targeted economic growth. An unstable political environment, inadequate capital formation, unemployment problems, and high risk are the causes of inadequate FD and low economic progress in Nepal. In such a prospect, this study focuses on examining how different financial variables affect economic growth and investigates the contributing role of financial variables in the acceleration of economic growth in Nepal. Therefore, this study focuses on the following research question: Is the causal link between financial development indicators and economic growth in Nepal?

The objective of this study is to examine the causal relationship between financial development and economic growth in Nepal. This study examined the impact of financial development indicators (broad money supply, bank liabilities, and bank credit to the private sector) on economic growth. The remainder of this paper is organized as follows: section two deals with the literature. section three covers the research methodology. Section 4 presents the estimation results and discussion. Section five summarizes and draws conclusions from the study. Finally, section six of this paper deals with the limitations and provides suggestions for future studies.

## 2. Literature Review

Financial development is positively associated with economic growth (Goldsmith, 1969; Gurley and Shaw, 1967; McKinnon, 1973). Bagehot (1873) and Hicks (1969) observed that FD plays a key role in capital mobilization for the industrial promotion of the economy. In the theoretical aspect of FD and economic growth, Gurley and Shaw (1955) revealed (i) a quantitative channel in which capital is accumulated from individual savings and debt to invest in the production sector, and (ii) a qualitative channel in which factor productivity is focused on the innovation of new technology and techniques via the best allocation of resources in the production sector to increase efficiency and quality in production activities.

Schumpeter (2011) revealed that banks and financial markets encourage technological advancement by funding various projects for a smooth production process that accelerates economic growth. This hypothesis considers the supply leading role of FD in the economy. In support of this hypothesis, Sinha and Macri (2001) state that a well-functioning financial system encourages entrepreneurs to use advanced innovations to reallocate resources and accelerate economic growth. The prosperous financial system of an economy decreases transactions, information, monitoring costs, and so on, leading to rapid economic development (Cherif and

Gazdar, 2010). However, Lucas (1988) and Stern (1989) argue for the insignificant contribution of FD to the economic growth of a nation.

Contrary to the contribution of FD in accelerating economic growth, Patrick (1966) argued the demand-following hypothesis and observed economic growth prerequisites for finance services and the financial development of the nation. Robinson (1952) found an economic growth guide for the FD of the economy. This hypothesis asserts that real sector growth facilitates economic development. The growth of the real sector determines the expansion and development of financial institutions and services. However, Greenwood and Smith (1997) observed bidirectional long-run causality between FD and economic growth. The literature shows debatable issues about the contributing role of FD to economic growth, whether: (i) FD causes economic growth (Levine and Zervos, 1998; Rousseau and Wachtel, 1998), (ii) economic growth contributes to FD (Goldsmith, 1969; Gurley and Shaw, 1967) or (iii) there is a bi-directional causality between FD and economic growth (Luintel and Khan, 1999; Shan et al., 2001).

Xu (2000) examined the impact of financial variables and their effects on growth using data from 1960-1993 by applying the VAR model and explored the positive influence of FD on real GDP growth in emerging economies. Sinha and Macri (2001) investigated the causal association between FD and GDP growth using time-series data and revealed a positive causal relationship. Ramlal and Watson (2004) assessed the contributory role of FD in economic growth considering time-series data from 1970-2002 with the application of VAR, impulse response, and VECM models, and reported that FD has a significant role in economic growth, both in the short and long run. Khan et al. (2005) employed the ARDL model to analyze time-series data and observed a long-lasting association between financial depth and economic development.

In an empirical investigation of FD and economic growth, Khaled et al. (2006) considered time-series data from 1989-2001 and revealed no long-run significant link between them. Lu and Yao (2009) used time-series data from 1960-1994 by employing the Geweke decomposition test and found that FD is a crucial variable that has a direct impact on GDP growth and confirmed the bi-directional causality between GDP growth and FD. Antonios (2010) used time-series data from 1965-2007 and applied OLS to explore the significant association between FD (credit and stock market development) and economic growth. The cointegration estimate shows that FD increases economic growth to eradicate poverty, and a long-run relationship exists among FD, poverty alleviation, and Indian economic growth (Pradhan, 2010).

FD indicators, economic growth, and control factors of high-income economies have a strong causal of FD with long-run economic growth (Bangake and Eggoh, 2011). Al-Malkawi et al. (2012) investigated causality

using time-series observation from 1974-2008 by applying ARDL modeling and observed a significant inverse bidirectional nexus between FD indicators and economic progress. FD indicators have positively contributed to economic acceleration in China (Zhang et al., 2012).

In a cointegration analysis, Iheanacho (2016) used the ARDL technique to investigate the link between FD indicators and economic prosperity, considering bank credit, liabilities (liquid), and bank deposits as independent (explanatory) variables and GDP per capita as a dependent (explained) variable, and revealed a negative and minor causation between FD and long-term as well as short-term economic growth. Eren et al. (2019) examined the causal link between FD and economic acceleration using a cointegration model, revealed a strong positive correlation, and confirmed that improvements in the financial sector contribute to economic growth by fostering investment and enhancing overall economic activity in India.

Paudel and Acharya (2020) investigated the contributing role of FD indicators in economic growth using data from 1965 to 2018 by applying the ARDL approach, considering factors such as GDP (per capita), broad-money supply, domestic credit, FDI, gross capital formation, trade openness, and working-age population, and revealed that most of the financial variables contribute to economic growth. Policymakers have suggested creating a more favorable investment climate to attract foreign capital and accelerate the Nepalese economy. Selvasundaram et al. (2022) used ARDL models and revealed a significant negative relationship between FD and economic growth, but a significant positive link with the inclusion of credit to the private sector (CPS). However, excess CPS has an adverse influence on economic growth. Abbas et al. (2022) observed a bidirectional association between FD indicators and economic prosperity. Credit availability to the private sector has a contributing role in economic acceleration in a short period, whereas FD encourages the promotion of bank deposits that intend rapid economic growth over a long period (Chiwira, 2023).

The literature shows a significant positive contribution of FD indicators to economic growth in different economies, including Nepal. However, these studies have addressed various aspects related to FD indicators and their contributing role in economic growth to address issues regarding the causal link between FD and economic prosperity (growth) in the short and long run to investigate the role of major financial variables on economic growth in Nepal. In this prospect, the study is conducted to fill the research gap regarding FD variables and their causal relationship with economic growth in Nepal.

### 3. Research Methodology

This study applies a descriptive causality research design to assess the contributing role of FD indicators in determining economic growth, and examines the causality of FD variables and GDP growth in Nepal. This study applies the Johnson cointegration technique, Granger causality and VECM to assess the causal relationship between FD and GDP growth. This study uses the GDP growth rate as a dependent variable and broad money supply (BMS), bank credit to the private sector (BCTPS), and total bank liabilities (TBL) as explanatory variables to examine the causality of FD indicators and GDP growth in Nepal.

This study used secondary sources of time-series data for the study period of 1991-2023. The necessary secondary data were obtained from the Economic Surveys of the MoF and Nepal Rastra Bank covering 33 years to examine the causal link between FD indicators and GDP growth with the aggregate data of 33 observations. The collected data were processed and analyzed using the ninth version of the E-views software. In this study, the unit root test of stationarity, Johnson causality test, Granger causality, VECM analysis along with t-test, adjusted R<sup>2</sup>, F-test, etc. are used to assess the association between FD variables and GDP growth. The econometric model of Equation (1) was used to assess the causal association between FD and GDP growth in Nepal.

$$\begin{aligned} \text{LnGDP}_t = \alpha_0 + \sum \beta_i \text{LnFD}_t + \varepsilon_t = \alpha_0 + \beta_1 \text{LnBMS} + \beta_2 \\ \text{LnBCTPS} + \beta_3 \text{LnTBL} + \varepsilon_t \dots \end{aligned} \quad (1)$$

GDP indicates the economic growth rate, FD represents financial development, BMS stands for broad-money supply, BCTPS represents bank-credit to private sectors, TBL indicates total bank liabilities,  $\alpha_0$  stands for the intercept term,  $\beta$ ,  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  represent coefficients of explanatory variables, Ln is the natural logarithm, and  $\varepsilon_t$  is the error term at time t.

The empirical results of nonstationary time-series data present a perennial problem. This study intends to use Augmented Dick Fuller (ADF) unit root tests for stationarity to avoid spurious results and identify the order of integration using the intercept and time trend equation as follows:

$$\Delta Y_t = \alpha + \beta T + \rho Y_{t-1} + \mu_t \quad (2)$$

The ADF test is made using lagged values as equation 3.

$$Y_t = \alpha + \beta T + \rho Y_{t-1} + \sum_{i=1}^k \beta_i \Delta Y_{t-i} + e_t \dots \quad (3)$$

$e_t$  indicates the error term,  $\Delta Y_{t-1}$  represents  $(Y_{t-1} - Y_{t-2})$ ,  $\Delta Y_{t-k} = (Y_t - Y_{t-k})$ , k represents the lagged values of  $\Delta Y$ , and T represents the trend. The hypotheses for testing the stationarity of the data were set as follows:

H<sub>0</sub>:  $\rho = 0$ , there is the existence of a unit root.

H<sub>1</sub>:  $\rho \neq 0$ , there is no unit root or is stationary.

This study investigates whether FD is the reason for economic growth, or whether economic growth is a matter of FD.

The financial indicators BMS, BCTPS, and TBL are proxies for FD and GDP is the economic growth rate. To assess and investigate the causality between FD indicators and GDP growth, the Johansen cointegration examination is an appropriate method for the I(1) order. This analysis suggests a trace test ( $\lambda_{trace}$ ) and maximum eigenvalue test ( $\lambda_{max}$ ). The number of tests for the cointegrating relationship (r) must be identified. In the trace test, the null hypothesis is set by considering at most r co-integrating vectors against the number of variables (k) used in the stated model.  $\lambda_{max}$  statistic examines the null hypothesis of r co-integrating vectors against the test of alternative r + 1.  $\lambda_{trace}$  and  $\lambda_{max}$  were estimated using Equations (4) and (5), respectively.

$$\lambda_{trace}(r_0) = -T \sum_{j=r_0}^k \log(1 - \lambda) \quad (4)$$

$$\lambda_{max}(r_0) = -T \log(1 - \lambda_{r+1}) \quad (5)$$

where  $\lambda$  represents the eigenvalue and T indicates no. of observations, and k represents no. of the endogenous variables.

In this study, Schwarz tests were made to identify the number of appropriate lags for the Granger causality tests of cointegration using the bivariate models of equations (6) and (7).

$$\text{GDP}_t = \beta_1 + \sum_{i=1}^k \beta_{ij} \text{FD}_{t-i} + \mu_t \quad (6)$$

$$\text{FD}_t = \alpha_1 + \sum_{i=1}^k \alpha_{ij} \text{GDP}_{t-i} + \mu_t \quad (7)$$

Null hypothesis H<sub>0</sub>: FD does not Granger-cause GDP ( $\sum_{i=1}^k \beta_{ij} = 0$ ) and alternative hypothesis H<sub>1</sub>: FD Granger-causes GDP ( $\sum_{i=1}^k \beta_{ij} \neq 0$ ) in the case of equation 6. Null hypothesis H<sub>0</sub>: GDP does not Granger-cause FD ( $\sum_{i=1}^k \alpha_{ij} = 0$ ) and H<sub>1</sub>: GDP Granger-causes FD ( $\sum_{i=1}^k \alpha_{ij} \neq 0$ ). Finally, this study applied the VECM to Equation (8).

$$\Delta \text{GDP} = \beta_0 + \beta_1 \sum_i^k \Delta \text{BMS}_{t-1} + \beta_2 \sum_i^k \Delta \text{BCTPS}_{t-1} + \beta_3 \sum_i^k \Delta \text{TBL}_{t-1} + \lambda \text{ECT}_{t-1} + \varepsilon_t \quad (8)$$

where  $\Delta$  represents the first difference,  $\text{ECT}_{t-1}$  is the error correction term,  $\lambda$  is the short-run coefficient of the EC term ( $-1 < \lambda < 0$ ),  $\varepsilon_t$  is the white noise term.

### 4. Results and Discussion

Different tests were used to identify whether the variables had unit roots. The simple regression results from variables with a unit root are spurious. This study made the ADF unit root test of each variable to make the time series data and test statistics stationary, as presented in Table 1.

Table 1 shows that all variables have the problem of unit roots and are non-stationary in the label data. The ADF test results confirmed the unit root of the variables used in the models because the values of the test statistics

were less than the critical values at the 5 percent level of significance.

**Table 1. ADF unit root test of variables at level and first difference (compiled by the authors)**

ADF unit root test at level		ADF unit root test at first difference		Critical value at the 5% level
Variables	Test Statistics	Variables	Test statistics	
LnGDP	-2.153	$\Delta$ LnGDP	-5.781	3.537
LnBMS	-1.916	$\Delta$ LnBMS	-4.053	3.537
LnBCTPS	-2.174	$\Delta$ LnBCTPS	-5.681	3.537
LnTBL	-1.849	$\Delta$ LnTBL	-6.862	3.537

Note: Estimation is based on the datasets of MoF and NRB (1991-2023).

However, Table 1 also shows that the variables are stationary at the first difference, because the test statistics are greater than the critical values at the 5 % level of significance.

All variables were integrated in a similar order to I(1). Johansen cointegration is an appropriate technique for testing a series to determine whether a long-run

association exists. Table 2 presents the Johansen cointegration results. The statistical  $\lambda$  trace value was greater than its critical value and was significant at the 5 % level. Similarly, the statistical value of  $\lambda_{max}$  was greater than the critical value (P-value < 0.05).

**Table 2.  $\lambda$  trace and  $\lambda$  max tests (compiled by the authors)**

Tests	Null hypothesis	Alternative hypothesis	Statistical value	Critical value	P-value	Egen-value
$\lambda_{trace}$ tests	r = 0	r = 1	58.447	47.856	0.015	0.781
$\lambda_{max}$ tests	r = 0	r = 1	37.858	27.584	0.009	0.781

Note: Estimation is based on the datasets of MoF and NRB (1991-2023)

Null hypotheses (r=0 or no cointegration) based on both  $\lambda$  trace and  $\lambda_{max}$  are rejected, and alternative hypotheses with at least one cointegration (r=1) are accepted, which implies the existence of a long-term causal link between FD indicators and GDP growth.

**Table 3. Long-run coefficient of the variables (compiled by the authors)**

Variables	Coefficient	T-statistics
LnBMS	-.57	-4.053
LnBCTPS	-.25	-5.681
LnTBL	-.49	-6.862

Note: Estimation is based on the datasets of MoF and NRB (1991-2023).

Table 3 shows the long-run coefficient of the Johansson cointegration test results. All coefficients are negative and statistically significant, implying a positive and statistically significant long-run relationship between GDP growth and FD variables in Nepal.

Table 4 presents the results of VECM. The coefficients of  $\Delta$ LnBMS,  $\Delta$ LnBCPS, and  $\Delta$ LnTBL are significant (p < 0.05, t-statistics > critical values), which indicates a causal link between FD indicators and GDP growth. The error correction term (EC<sub>t</sub>) coefficient is 0.581 (P-value<0.05) that implies there is a long-run causality association between FD indicators (BMS, BCPS, and TBL) and economic growth at a speed of 58.1 percent.

**Table 4. Vector error correction model (compiled by the authors)**

Regressors	Coefficient	t- statistics	Probability
Constant	1.356	6.353	0.000
$\Delta$ LnBMS	0.317	2.641	0.041
$\Delta$ LnBCPS	0.532	3.053	0.014
$\Delta$ LnTBL	0.624	5.809	0.000
EC <sub>t</sub> (-1)	-0.581	4.327	0.000
Adj. R <sup>2</sup> =	F-statistic =	P-value:	DW=1.824
0.725	11.935	0.018	

Note: Estimation is based on the datasets of MoF and NRB (1991-2023)

The results confirm that deviation from long-run equilibrium is adjusted by 58.1 percent of the disequilibrium within a year, which indicates the estimated short-run dynamics that show short-term causality between FD and GDP growth (P-value < 0.05). Diagnostic tests confirmed that the estimated model in this study had no autocorrelation problems (DW=1.824). F-statistics of 11.935 (P-value<0.05) indicates an appropriate fit of the model. An adjusted R<sup>2</sup> of 0.725 indicates that FD indicators have 72.5 percent explanatory power for economic growth in Nepal.

Table 5 shows the Granger causality statistics between the FD indicators and economic growth.

Table 5 shows the Granger causality between FD indicators and GDP growth, which indicates that GDP growth does Granger-cause FD proxies by BCPS, BMS, and TBL, and that the F-statistic is significant (P-value<0.05).

**Table 5. Granger causality tests (compiled by the authors)**

Null hypothesis	Observation	F-statistics	P-value
BCPS does not Granger cause GDP	33	6.493	0.017
GDP does not Granger cause BCPS	33	5.318	0.019
BMS does not Granger cause GDP	33	8.513	0.012
GDP does not Granger cause BMS	33	3.231	0.024
TBL does not Granger cause GDP	33	4.619	0.021
GDP does not Granger cause TBL	33	3.175	0.035

Note: Estimation is based on the datasets of MoF and NRB (1991-2023). The causality between the explanatory variables was excluded.

In addition, the results show that BCPS, BMS, and TBL Granger-cause GDP. The F-statistics are significant ( $P\text{-value} < 0.05$ ) which indicates strong causality between FD and GDP growth. The results confirm the bidirectional causality of FD indicators and GDP growth. This research has applied the VECM, and the results are presented in Table 4 to assess the short-run dynamics along with the long-run equilibrium association of FD indicators and GDP growth in Nepal.

Antonios (2010) applied OLS modeling; Xu (2000) and Ramlal and Watson (2004) used VAR models; Ramlal and Watson (2004) employed VECM; Khan et al. (2005); Al-Malkawi et al. (2012); Iheanacho (2016); Paudel and Acharya (2020); and Selvasundaram et al. (2022) applied ARDL models to analyze the relationship between financial development and economic growth. This study is based on Johansen cointegration, VECM, and Granger causality techniques. The findings of this study indicate a positive effect of financial development on economic growth, which is consistent with the results of McKinnon (1973), Sinha and Macri (2001), Xu (2000), Schumpeter (2011), and Zhang et al. (2012), and inconsistent with the findings of Selvasundaram (2022). The results of this study confirm that financial development causes economic growth in both the short and the long run. This causal relationship supports the findings of Levin and Zervos (1988), Rousseau and Wachtel (1998), Sinha and Macri (2001), Khan et al. (2005), Khaled (2006), Antonios (2010), Pradhan (2010), Bangake and Eggoh (2019), and Chiwira (2013).

## 5. Conclusion

This study assessed the causal association and contributing role of FD indicators in economic growth. This study applies Johansen cointegration analysis, Granger causality, and vector error correction models to investigate the long-term causal relationship and short-term adjustments between FD indicators and GDP growth in Nepal during the study period. This study reveals that FD substances for GDP growth and GDP growth also intend to promote FD in Nepal. In addition, the empirical results reveal a strong bidirectional association between the FD indicators and GDP growth. This study confirms that the FD indicators broad money supply, bank credit to the private sector, and bank liabilities all have the expected positive long-term effect on GDP growth. Moreover, the results of short-run dynamics show that all financial variables are stable and have a strong short-term relationship with economic growth. The error correction result shows the adjustment

of most of the disequilibrium by the development of financial indicators for assessing economic growth. Finally, this study concludes that FD indicators play a significant role in the short- and long-run for the acceleration of economic growth in Nepal. The conclusion of the causal relationship between FD and economic growth is consistent with prior findings. Therefore, policymakers should focus on the formulation and implications of various policies to create a strong financial system for rapid economic development in Nepal.

## 6. Limitations and Further Study

No study has covered all aspects of the research problem. This study limits annual observations of time-series data for the years 1991 through 2023, considering only three explanatory variables: broad money supply (BMS), bank credit to the private sector (BCTPS), and total bank liabilities (TBL) using limited research techniques. Therefore, similar future studies are suggested to be administered in future with incorporation more annual and quarterly observations including other explanatory variables such as gross domestic product per capita (GDPPC), trade openness, inflation rate, foreign direct investment (FDI), gross capital formation, stock market development etc. with application of other research models such as OLS, 2SLS, ALDL etc.

## Author Contributions

Conceptualization, P.L. and B.D.D.; methodology, P.L. and P.M.S.; software, B.D.D.; validation, P.L., B.D.D., and P.M.S.; formal analysis, P.L. and B.D.D.; investigation, P.L.; resources, P.M.S.; data curation, B.D.D.; writing-original draft preparation, P.L.; writing-review and editing, P.L., B.D.D., and P.M.S.; visualization, P.L.; supervision, B.D.D.; funding acquisition, P.L., B.D.D., and P.M.S. All authors have read and agreed to the published version of the manuscript.

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## Data Availability Statement

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## Conflicts of Interest

The authors declare that there are no conflicts of interest with respect to research, authorship, and other individuals and institutions that are perceived as inappropriately influencing the presentation and interpretation of results, reporting of research findings, and the decision to publish this article.

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