
Financial Development and Economic Growth

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Received: 28 July 2023

Accepted: 17 October 2023

Published: 01 December 2023

Abstract: This paper aims to examine the effect of financial developments and economic growth in Nepal employing Autoregressive Distributed lag Model (ARDL) approach of cointegration using the time series data for the period from 1972-2022. Nepal is a unique country for specific case study as it represents the group of landlocked Developing countries and lagging, behind even having lots of natural beauties, and resources within the country. After a recent, significant political shift, Nepal's stable government is currently actively pursuing significant amounts of foreign direct investment. We develop a model with four proxies of financial development (Broad money, Domestic credit by private sectors, Foreign Direct Investment, Gross Capital formation) and econometrically test their contribution in economic growth. And the long bound test suggests that we can reject the null hypothesis of no co-integration and conclude that the variables are co-integrated at all significance levels. Therefore, based on the F-bound test results, we can conclude that there is evidence of co-integration between the variables in the ARDL model.

Keywords: GDP, M2, FDI, GCF, DCP, ARDL.

1. INTRODUCTION

In the economic and financial literature, the significance of financial development in economic expansion is hotly contested. Economic advancement. Financial development is meant to lubricate economic activity and boost growth. A country's economic growth. Not all nations use financial development for its intended purpose. The reason Nepal is a special country for country-specific case studies is that it stands for a group of landlocked developing nations that are falling behind even though they have abundant natural resources, access to large markets in their neighbors, a labor force that is relatively inexpensive and has a high demographic dividend, are sandwiched between two rapidly growing, sizable economies—China and India—and have an evergreen climate that is ideal for agriculture. Notably, Nepal was a pioneer in the adoption of reform and liberalization measures.

For a country-specific case study, Nepal stands out since it is a representative of the group of developing nations that are landlocked. Nation and trailing the market is sizable in a closed neighbor, relatively inexpensive labor with high population income, situated between two significant rising economies India, and China, and the climate remains favorable for agriculture despite the country's richness of natural beauty and resources. When it started reforming in the middle of the 1980s at the request of foreign financial institutions, donor development agencies, and partner's .Particularly in the regional as well as the international contexts, Nepal is setting the pace for liberalization and reform measures. Nepal has inaugurated a new elected administration, and it seems to be a stable government.

Nepal's central bank, the Rastra Bank of Nepal, regulates the banking industry, which comprises commercial banks, development banks, financial institutions, and microcredit development banks/institutions. It also oversees recognized savings and credit cooperatives and non-governmental financial entities. Only certain types of banking transactions are authorized. Central banks, on the other hand, do not oversee or monitor Employee Provident Funds, Citizen Investment Trusts, insurance companies (including life and non-life), or the stock market. More importantly, over 10,000 cooperatives have engaged in financial activities, some of which are larger than local development banks. They are not subjected to stringent scrutiny and may pose a risk to the financial stability system.

The primary purpose of this study is to analyze the relationship between financial development and economic growth in Nepal by analyzing time series data from 1972 to 2022. It uses the ARDL integration technique to examine whether there is a long-term relationship between financial development and economic growth in Nepal. Deposit-taking financial institutions include commercial banks, development banks, microcredit development banks, finance companies, financial cooperatives, and non-governmental organizations (financial) that engage in limited banking activities (NRB, 2005). Additional financial institutions include the Nepal Stock Exchange, Employees Provident Fund, Citizen Investment Trust, Postal Savings Offices, and Insurance Companies, in addition to various contractual savings groups.

However, development banks are fast growing and acquiring a sizable percentage of financial assets. As a result, the central bank has expanded its monetary survey to include development banks and lending institutions. The Nepal Rastra Bank Act of 2002 and the Banks and Financial Institutions Act of 2006 provide the necessary legislative framework for the central bank to regulate and supervise banks and financial institutions. Although the first commercial bank, Nepal Bank Ltd, was established in 1937, banking development was most notable with the establishment of the Central Bank of Nepal, known as Nepal Rastra Bank (NRB), in 1956, which initiated the spread of financial services in Nepal. There were just two commercial banks and two development banks before to 1975.

According to Bhetuwal (2007) in *The Role of Financial Development in Economic Development*, the adoption of financial liberalization policies in the middle of the 1980s led to a sharp increase in the number of banks and financial institutions. A result of the remarkable financial system expansion, there are 64 micro-credit development banks, 21 commercial



banks, 17 development banks, and 17 finance companies as of August 1, 2023. In an effort to strengthen its financial system, Nepal began financial sector reform initiatives in the late 1990s. These initiatives led to some positive financial sector advancements.

Economic growth is significantly influenced by bank loans. It meets the need for resources for economic expansion, particularly in emerging nations like Nepal. As a result, NRB and the government have implemented several policies and initiatives to spur economic growth by utilizing bank credit. To identify the percentage of bank loans and advances going to productive sectors (agricultural, energy, tourism, and industry), Nepal Rastra Bank has been regarded to be taking the lead. The primary goal of this clause is to promote national economic expansion. However, the link between financial development and economic growth in the context of Nepal has not yet been adequately evaluated. This work makes an effort to close the gap in this aspect. Consequently, the primary goal of this study is to investigate the impact.

Literature Review

1.1 Global Context

An examination of the literature reveals that there has been controversy about the role of financial development from the age of the industrial revolution, when the role of finance was tied to societal economic activity. Consider the following assumption: According to Gurley and Shaw (1955), the absence of a financial sector impedes the advancement of the realm of actuality. According to McKinnon and Shaw (1973), financial development has a role in economic growth. Buffie (1984), on the other hand, takes a different perspective on the link between financial development and economic expansion. The studies look at how unregulated financial markets influence the actual world. According to research, when formal financial institutions grow, the financial sector's reserve requirement ratio grows, resulting in a lack of liquidity Paudel and Perera (2009) this study questions the link between financial development and economic growth using time series data from Sri Lanka from 1955 to 2005. The report contains six significant financial development measures. Utilized were both original and co-integrated unit econometric techniques. According to the Granger causality test, the development of the financial sector and economic growth are causally related. According to several research, financial development encourages economic growth.

1.2 Nepalese Context

The importance of financial development in economic expansion has received little attention in Nepalese history. However, we discovered several research about Nepal's financial industry. Paudel (2005), for example, examines the financial system to determine the beneficial benefits of the financial sector on economic growth. Narrow and broad money, bank credit, and currency aggregation are key variables used to capture the financial system. Constructs the financial liberalization index and studies the impact of financial liberalization on economic growth in Nepal to assess if financial liberalization has a positive impact on financial development. Nepal has conducted very little research on financial development and economic growth (Shrestha 2005)

Bhetuwal (2007) financial liberalization enhances the financial system and results in parallel growth in all areas of the economy, according to research on Nepal's financial liberalization issues. Using annual data from 1975 to 2012, Gautam (2014) examines the relationship between financial development and economic growth in Nepal. He calls for a unified financial system to handle new trends including sustainability and post-crisis resilience..

Research Question

Does Nepal's economic growth benefit from financial development?

Research Objectives

Measurement of the impact of broad money, foreign direct investment, domestic credit to the private sector, and gross capital formation on economic development is the goal of this study.

Hypothesis:

H1: There is significant impact of Broad money on Economic Growth

H2: There is significant impact of FDI on Economic Growth

H3: DCP has a significant impact on Economic Growth

H5: GCF has a significant impact on Economic Growth

2. RESEARCH METHODOLOGY

Positive advancements in many aspects of the financial sector, including financial institutions (supply) and financial markets (supply needs), lead to financial development. Due to the lack of an important indicator to describe the overall financial status position, we discover that several financial development indicators are employed in the literature. The situation evolves inside an area, country, or state. Economic growth is a long-term phenomenon that results from the combined effort of production variables such as capital, labor, and technology. The challenge of economic development in the contemporary economy is compounded by the amount a variety of factors can contribute to economic growth. As a result, the variables employed to estimate economic development are not the only ones available.

One of the major issues is the lack of data on the variables most suited to the context. In this regard, there is a problem. Time series data, in particular, for financial development Activities and variables are usually a problematic topic in underdeveloped countries. The following are the most common variables in this research field that we employ in this study. Broad money, a typical proxy for financial development, is employed in this study to quantify the overall money supply in a sector. Both of these variables were utilized in the model. Overall, domestic credit given to the business sector in the economy aids in understanding credit utility in the private sector and reflects the economy's finance absorption capability. As a result, it has been utilized as another proxy.

FDM1= M1 to GDP (BROADMGDP in dataset)

FDM2=DCBS to GDP (DCBSECGDP in dataset)

FDM3= GCF GDP (GCFGDP in dataset)

FDM4= FDI GDP (FDINFLGDP in dataset)



Where,

M1= Broad money

DCBS= Domestic Credit to Banking Sectors

GCF= Gross Capital Formation

FDI= Foreign Direct Investment

The Model, Variables, and Data

The dependent variable is GDP (GDP), which measures economic growth. Our primary interest criterion is financial development (FD), which we examine using the four indicators we previously described. The reason for this is that the financial progress cannot be represented by a single variable. Our goal in doing this is to gather as much information on the financial development as we can in order to conduct a reliable study and determine its effect on economic growth. For econometric estimate, this paper employs secondary data gathered from the World Bank Group (2023). The statistics cover the years 1972 through 2022 and are yearly data. Since there are gaps in the FDI data for 1975–1977 and 1992–1995 in this model, the 3 year moving average approach is used. The practical embodiment of the:

GDP= f (FD) Where, GDP stands for Gross Domestic Product. In many models, FD is represented by five metrics, which are as follows:

BROADMGDP = Broad money (as a percentage of GDP)

DCRPRVGDP = Domestic credit to banking sector (as a percentage of GDP).

FDINFLGDP = the proportion of GDP that is made up of foreign direct investment

GCFGDP = Gross capital creation as a percentage of GDP

The model will be constructed as follows:

$$GDP = \alpha + \alpha_1 FD_t + U_t \dots \dots \dots (1)$$

Where,

U= error term

t= 1972-2022

α is an intercept,

α_1 coefficient of relevant variables

In each equation, FD is substituted by one of the four FD proxies.

3. RESULT AND CONCLUSION DESCRIPTIVE STASTICS

Descriptive statistics are essential for understanding the characteristics of a given data set. They provide a concise summary of the data and help researchers to identify patterns and relationships within the sample. In this study, descriptive statistics are used to summarize the sample of the population under investigation

Table 1 The result of descriptive stastics

	LN_GDP	M2	GCF	FDI	DCP
Mean	26.19173	49.96964	24.00489	0.153495	30.89878
Median	26.35989	43.96964	22.55613	0.056611	23.19776
Maximum	29.22711	120.6568	41.37874	0.677440	103.6514

Minimum	23.02275	12.37246	7.329540	-0.098375	3.515286
Std.Dev.	1.893192	29.27679	7.708877	0.194799	26.69616
Kurtosis	1.778181	2.686280	2.870381	2.809064	3.151094
Jarque- Bera	3.201934	5.525377	0.383060	8.589589	9.433705
Probability	0.201701	0.063122	0.825695	0.013639	0.008943
Sum	1335.778	2548.452	1224.249	7.828270	1575.838
Sum Sq. Dev	179.2088	42856.52	2971.339	1.897333	35634.24
Observations	51	51	51	51	51

The mean values for the variables range from 0.153495 to 49.96964 indicating variation in their central tendencies. Based on this information, the data seems suitable for regression analysis, as it contains the necessary variables and observations for modeling relationships and making predictions. The Jarque-Bera test is a goodness-of-fit test that assesses whether the distribution of the data is normal. A p-value is calculated to determine the probability of obtaining the test statistic if the null hypothesis is true. If the p-value is less than a significance level (usually 0.05), the null hypothesis is rejected, indicating that the data is not normally distribute.

Unit Root Test

According to Gujarati (2009) a time series variable is stationary or not using a statistical procedure known as a unit root test. When the mean, variance, and autocorrelation remain constant during the duration of the data, a time series is said to be stationary.

Table 2 The result of ADF test

	Adf	Integrated/ non integrated
Variables	At level	1 st difference
LN GDP	0.6606	0.0000**
M2	0.9956	0.0000**
FDI	0.0077**	
GCF	0.3243	0.0001**
DCP	0.9992	0.0000**

Notification (*) Significance at 10%. (**) Significance at 5%, (***) at 1% and (no) Not Significant

Table 2's unit root test results reveal that four variables, LNGDP, GCF, DCP, and M2, are non-stationary at the 5% level of significance and have p-values larger than 0.05. This suggest that these variables have a unit root, indicating non stationary. However, after taking the first differences, LNGDP, GCF, DCP, M2 became stationary. This indicates that these variables exhibit a trend and can be made stationary by taking first difference. On the other hand, FDI is already stationary at level. This suggest that the variable is stationary and does not require differencing to achieve stationary.



In summary, the unit root test results show that some variables in the data set are unstable and requires differentiation to achieve stability. The information obtained from these tests is important to choose the right modeling technique and get reliable results.

Leg Length Criterion

Model selection criteria such as AIC (Akaike Information Criterion) and SCI (Schwarz Information Criterion) are frequently used to calculate lag duration. These criteria take into account the model's goodness-of-fit and complexity.

Table 3 VAR optimal Lag Length Selection Criteria

Lag	Log l	LR	FPE	Aic	SC	HQ
0	-335.5050	NA	12.25411	13.85735	14.01178	13.91594
1	-101.9138	419.5107	0.001708	4.976074	5.748246*	5.269035
2	-78.58386	38.08973*	0.001284*	4.67892*	6.066801	5.204222*

Notifications: *denotes the lag order determined by the condition; LR: the sequential modified LR test statistic (each test at a 5% confidence level); FPE is for final prediction error, while AIC stands for Akaike information criterion. HQ: Hannan-Quinn information criteria; SC: Schwarz information criterion Criterion Authors calculated using data taken from the sources listed in section 3. According to table 3, the maximum lag duration of variables is two.

In the case of a small sample (60 or less observations) Akaike's information criterion (AIC) and final prediction error (FPE) are superior to the other study criteria in that they minimize the likelihood of underestimation while maximizing the likelihood of recovering the true lag length (Liew, 2004). As a result, the model's predictions will be more accurate and will better reflect the dynamics of the underlying system.

ARDL Co-Integration Test

A co-integration test based on the autoregressive distributed lag (ARDL) technique will be used to assess the variables in equation (1) (Paudel, R. C., & Kankesua, 2009; Nkoro, E., & Uko, A. K., 2016). The ARDL technique to co-integration is popular because it addresses the issue of stationary behavior and enables the estimation of a variety of variables, including I (0) and I (1) variables. Additionally, it tackles the estimation issues brought on by the explanatory variables' serial correlation. Because of these characteristics of time series data, co-integration is recognized as a powerful statistical method for time series data analysis.

Equation (1) is stated below in ARDL form:

$$\Delta GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 fd_{t-1} + u_t \dots \dots \dots (1)$$

Equation (2) uses an auto-regressive distributed-lag model to represent the dynamic impact. The model's first order differential variable is denoted by the symbol Δ . The first order variable's coefficients β and, which stands for intercept. In the same way, and β_1, β_2 , are the parameters, and U_t is the vector of random error.

Table 4 Result of ARDL co-integration test

Variable	Coefficient	Std.error	t-Statistic	Prob.*
LN_GDP(-1)	1.000050	0.018722	53.41697	0.0000



M2	-0.007275	0.003090	-2.354210	0.0232
M2(-1)	0.005876	0.002065	2.844842	0.0068
GCF	0.001968	0.002768	0.711107	0.4809
FDI	0.030379	0.060407	0.502913	0.6176
DCP	0.000938	0.002987	0.313870	0.7551
C	0.122871	0.391405	0.313922	0.7551

R- Squ.	0.999247	Mean dependent Variable	26.25432
Adj. R- Squ.	0.999142	S.D dependent Variable	1.858342
S.E of Regression	0.054421	Akaike info criterion	-2.854938
Sum squared resid	0.127354	Schwarz criterion	-2.587255
Log likelihood	78.37345	Hannan- Quinn criter	-2.753003
F- statistic	9515.421	Durbin- Watson Stat	1.67004
Prob (f- statistic)	0.000000		

Long Bound Test

Table 5 Results of long bound test

Test statistic	Value	Signif	I(0) Asymptotic: n=1000	I(1)
F- Statistic	44.53021	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual sample size	50		Finite sample =50	
		10%	2.372	3.32
		5%	2.823	3.872
		1%	3.845	5.15

The F-statistic value of 44.53201 in the preceding F bound test result is larger than the lower and upper bound critical values at all significance levels (1%,5%,10%). This implies that we may reject the null hypothesis of no co-integration and conclude that the variables are co-integrated at all levels of significance. As a consequence of the F-bound test findings, we may infer that co-integration between the variables in the ARDL model exists

Table 6 Results of Error Correction Regression

Variables	Coefficient	Std.Error	t- statistic	Prob.
D(M2)	-0.007275	0.001594	-4869758	0.0000



CointEq(-1)	0.04990005	2.89006	17.26988	0.0000
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R squ.	0.297680	Mean dependent Variable	0.1223300
Adj. R Squ.	0.283048	S.D dependent Variable	0.060833
S.E of Regr.	0.051509	Akaike info criterion	-3.054938
Sum squared resid	0.127353	Schwarz criterion	-2.978457
Log likelihood	78.37345	Hannan- Quinn Criter	-3.025814
Durbin-waston stat	1.670043		

Furthermore, the CointEq (-1) coefficient is close to equilibrium and statistically significant at the 5% level. This implies that the system has an error correction mechanism, in which the dependent variable adjusts to restore the long-run equilibrium connection between the variables. In other words, if the system deviates from long-run equilibrium, the dependent variable will adjust in the short run to bring the system back into long-run equilibrium. In the model, the error correction term captures the short-run dynamics of the adjustment process towards the long-run equilibrium. It is predicted to be 4.99%, implying that each period corrects around 4.99% of the departure from long-run equilibrium.

Diagnostic Test

The classical assumption test is used to examine whether or not the regression model's estimation findings are biased. The purpose is to guarantee that the model fits the best linear unbiased estimator's (BLUE) assumptions. If all of the assumptions are met, the regression results can be analyzed and conclusions drawn. Several tests are included in the classical assumption test, including the normality test, autocorrelation test, heteroscedasticity test, multicollinearity test, and linearity test. (Brooks, 2008). The ARDL model does not require multicollinearity test because there is different level of data in the use of the model (Farray & Glauber, 1967.) As a result, the classical assumption test employed in this work included autocorrelation, normality, heteroscedasticity, and linearity tests.

LM Test

Table 7 Breusch-Godfrey Serial Correlation LM Test No serial association at up to two lags, according to the null hypothesis.

F-Stat.	0.627154	Prob.F (2,41)	0.5392
Obs* R squ.	1.484236	Prob. Chi-Squared(2)	0.4761

Serial correlation for autocorrelation is the term used to describe a correlation between data in a series of data that are grouped chronologically. The absence of serial correlation for lags up to two is the null hypothesis for this test, which implies that there is no link between the errors. This test's F-statistic is 0.627154, and the associated p-value is 0.5392. Since the p-value is

larger than the significance threshold of 0.05, we cannot completely rule out the null hypothesis that there is no serial connection at up to two delays. Based on the results of the Breusch-Godfrey serial correlation LM test, we may conclude that there is no evidence of autocorrelation (serial correlation) in the regression model up to 2 lags.

Heteroskedasticity Test

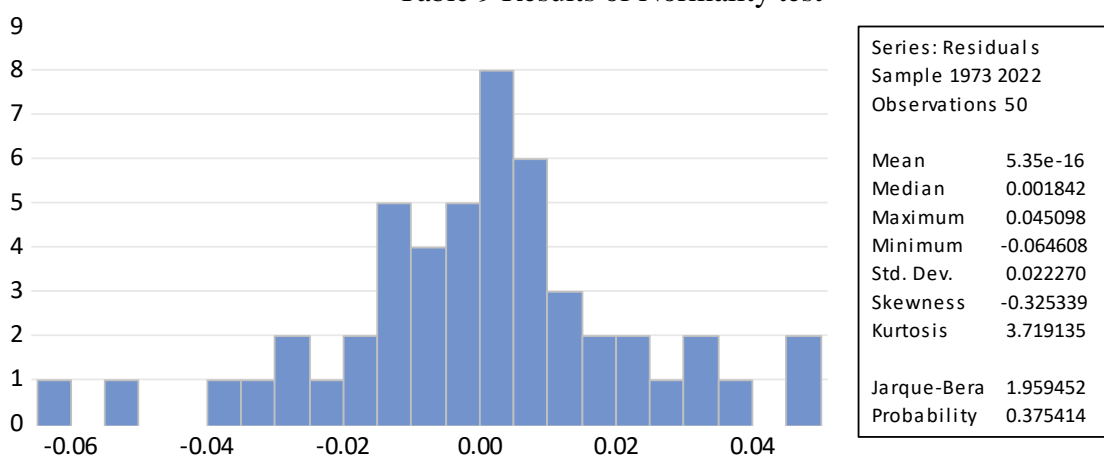
Table 8 Heteroskedasticity test results

F-Stat.	4.363582	Prob.F(6,43)	0.2647
Obs*R squ.	6.615257	Prob. Chi Squ.(5)	0.2509
Scaled explained SS	7.513607	Prob. Chi Squ. (5)	0.1852

The F-statistic in this test is 1.34814, and the related probability value (p-value) is 0.2647. We cannot reject the null hypothesis of homoscedasticity since the p-value is bigger than the significance level of 0.05. We may infer that there is no evidence of heteroskedasticity in the regression model based on the findings of the Breusch-Pagan-Godfrey test.

Normality Test

Table 9 Results of Normality test



The test statistic and p-value for the Jarque-Bera test for residual normality are 1.959452 and 0.375414, respectively. We cannot rule out the possibility that the residuals are normally distributed because the P value is higher than the 0.05 significance level.

4. CONCLUSION

This study uses the ARDL approach to cointegration and the long run bound test to assess the impact of financial development and economic growth in Nepal from 1972 to 2022. The ARDL test shows that the GDP and important financial variables including FDI, DCP, M2, and GCF have long-run cointegration.

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