Financial Development and Economic Growth: Evidence from Nepal

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Abstract

This paper aims to examine the role of financial development and economic growth in Nepal employing Autoregressive distributed lag (ARDL) approach of cointegration using time series data for the period from 1965 to 2018. Nepal is a unique country with big markets in the neighbors-India and China but remains as one of the poor landlocked developing countries, even being the earlier entrant in liberalization and reform. Nepal recently went through a substantial political transition and now the stable government is seeking substantial amount of foreign direct investment. In this background, it will be better, for a good policy analysis, to know how the financial activities have played the role in highly intended economic growth. We develop a model with five proxies of financial development (broad money, domestic credit to private sector, total credit from banking sector, capital formation, and foreign direct investment); and econometrically test their contribution in economic growth. Overall, the results suggest that financial development causes to economic growth substantially, except in the case of foreign direct investment. This result warns the policy makers to be more serious making investment friendly economy to attract the expected foreign direct investment.

Key Words: Financial development, Economic growth, ARDL cointegration approach

JEL Classification: C23, O16, O40

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I. INTRODUCTION

The role of financial system in economic growth has been widely discussed in the literature of development economics. Looking back at the historical literature, Gurley & Shaw (1955) argues that the real sector cannot go ahead without the financial sector. Buffie (1984) established a contrasting view of the relationship between financial development and economic growth. The role of financial development in economic growth was fundamentally established in the time of the industrial revolution, and it stands significant for developing countries context too in the similar fashion (Gupta, 1984). This is because financial sector manages huge working capital, provides information and innovative ideas to the entrepreneurs, who including many new in the market, run the new entity, adds in output and employment, increases additional consumption and saving (Perera & Paudel, 2009; Shrestha, 2005).

Formal financial inclusion reduces poverty and income disparity. A large section of the population can be included when the financial activities are physically accessible, procedures are easy and the cost of the finance is low (Pant, 2016). It can be the true part of 'Happy Nepali and prosperous Nepal'. Prosperity is associated with economic well beings. Possession of easy access for comfort living is strongly bonded with income level. Fulfillment of basic needs such as food, shelter, health care education; uplifts the materialistic wellbeing followed by the subjective well-being (Diener, Ng, Harter, & Arora, 2010).

Enterprises and industries are the base of economic growth, which also depend on the financial system. In Nepal, there are more than 11 thousands small-medium enterprises (SME) providing employment to 1.75 million people and contributing 22 percent to annual GDP (Nepal Government Ministry of Finance and United Nation Development Program, 2017). An inquiry revealed 25% of SME have not formal financial relation. The situation reveals the need for financial development in quality and quantity for the growth of the Nepali economy.

Also, financial development helps to expand the economy, raise the income, reduces the poverty, and enhances economic growth. An inefficient financial system costs high, reduces the investment and shrinks the employment and output. In such case, it ultimately retards the economy (Shrestha, 2005). The role of financial development in Nepal's economic growth has not been analyzed systematically yet covering the available data. This motivates this study to identify the role of financial development in economic growth.

Different findings have generated distinct views on the relationship between financial development and economic growth. There are mainly three views: the first view is that financial development and economic growth possess strong relation and financial sector leads the economic growth, the second view found

the bidirectional relation, even found economic growth leads the financial development. The third view found the reverse effect of the formal financial sector in economic growth. These various views indicate the scope of further research in the context of Nepal that is the objective of this paper.

This research paper is divided into five sections. After setting the introductory context, we highlight the context of financial development and economic growth in global and national context, followed by a brief discussion on literature in Section three. In Section four, we discuss the research methodology and results of the econometric estimation. The final section concludes with brief policy inferences and highlighting the limitation of this paper to pave the future research in this area.

II. FINANCE-GROWTH NEXUS IN NEPAL

Nepal remained back until the late 19th century in term of financial development. Its reflection is realized in economic growth. Journey initiated in 1880, by establishing the Tejarath Adda (Maskay & Subedi, 2009). It is known as the formal starting of a financial institution. Primarily it worked as an intermediary in credit mobilization. It covered limited transaction in a narrow band. The government provided the credit to staffs and landlords only. Still, merchants and landlords were the source of credit for the general public. After the establishment of Nepal Bank Limited in 1937, formal financial activities started. General people got access to a banking transaction. Nepal Rastra Bank established in 1956 as a central bank.

After the establishment of Central Bank, development of commercial banks and financial sector took the place. Liberal policy adopted on 1980, the financial sector geared quickly. Nepal Arab Bank Limited established in a joint venture in 1984. After the promulgation of the Nepal Rastra Bank Act 2002, the process of financial sector reform attained its peak. Rastra Bank started to regulate the financial sector as per the market requirement. The efficiency of the financial sector increased.

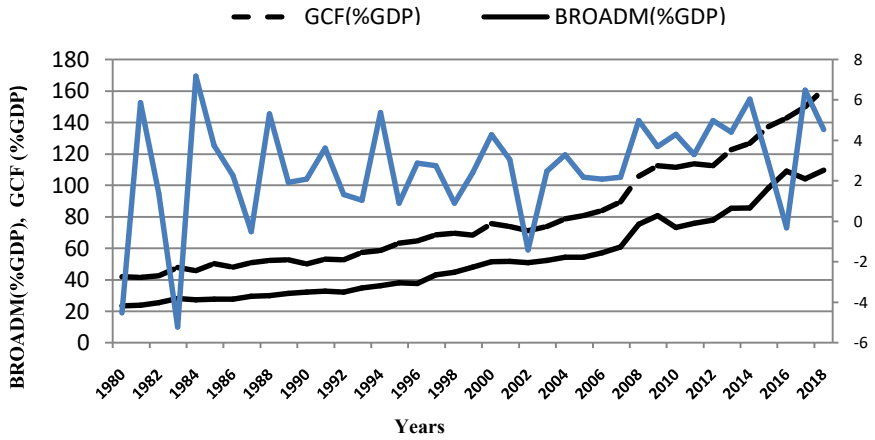
There are 28 commercial banks, 36 development banks, 25 finance companies and 64 microfinance companies in Nepal. Total of 24 cooperatives and 24 Non-Government Organization (NGO) are licensed by Nepal Rastra Bank for limited financial transactions. More than 35 hundred branches of financial organizations are carrying financial activities. A branch is serving for more than 34 hundred people in average. Until now 732 local governments have access to the financial system (Nepal Rastra Bank, 2019). Financial inclusion in Nepal is not satisfactory. The percent of Nepali adults with bank account is 45% in comparison to 70 percent average of South Asian Countries (World Bank Group, 2019). The

penetration of financial entity in Karnali Pradesh and remote districts is low. The growth rate of this place is lagged in comparison to other provinces.

Nepal needs specific attention to accelerate its economic growth to meet the target of graduating to a developing country by 2022 and to a middle-income country by 2030. Observing the world development report, it is realized that the advancement of financial entities and enlarge the size of capital for the economic development of Nepal is a fundamental issue (World Bank Group, 2018). The data shows; GNI Per Capita is $1034 for 2018/19, the growth rate is 4.8 in 2010 and 7.1 in 2018/19. At the same time inflation was recorded 15.1 and 4.2 percent respectively (World Bank Group, 2019). This situation appeals to fast economic growth, and financial development may be a way to achieve faster economic growth.

If we look at the graphical display, we can clearly notice that after the initiation of financial reform in 1980, the Central Bank emerged as an autonomous entity. Nepal Rastra Bank Act 2002 empowered the Rastra Bank to regulate the financial sector as per the ground reality of financial activities. It can be observed in Figure 1. The figure depicts the situation of broad money supply, capital formation and its effect on gross domestic per capita growth (GDPCG). During the reform phase, GDP growth was reasonably low, sizes of broad money and capital formation were small. As Nepal Rastra Bank emerged as a strong entity, volume of broad money increased, rate of capital formation increased and as a result GDP Per Capita Growth increased slowly. During the study period GDP Per Capita growth decreases due to the Maoist Insurgency, Indian trade Blockade, earthquakes in number of occasions.

Figure 1: **GDP per capita growth, Broad money supply and Gross capital formation**

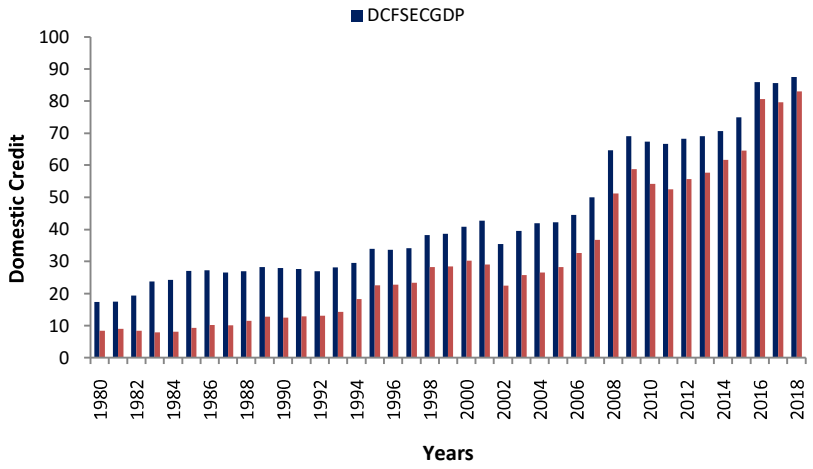


Source: World Development Indicator (2019)

Figure – 2 shows the share of commercial banks and other financial institutions in domestic credit expansion compared with GDP. The data show the influence of banking reform in the development of banking sector in comparison to other financial institutions. In the eve of reform, share of banking sector was negligible, now it is emerging as a dominating sector in credit expansion. Efficient and huge capital accumulated bank can afford required amount for long run investment in low costs. Scenario shows the good starting and overall increasing trend, but further expansion and strengthening of entire banking and financial are much awaited.

These backgrounds suggest that even financial reform program was launched from 1980 for the faster pace of economic growth. In the policy regime, Nepal is one of the earlier entrants to liberalization and reform in South Asia. Conventionally, it is believed that liberalization and reform support for financial development and trade performance (Paudel, 2014). But still Nepal is struggling in many respects of the development.

Figure 2: **Share of Banking sector and other financial institution in domestic credit**



Source: World Development Indicator (2019)

III. LITERATURE REVIEW

3.1 Global context

From a brief literature review, it is found that the role of financial development was in the discussion from the time of the industrial revolution, when the role of finance was linked with the economic activities in the society. Considering this background, Gurley & Shaw (1955) argues that the real sector cannot go ahead without the financial sector. McKinnon (1973) and Shaw (1973) establish the role of financial development in economic growth. On the other hand, Buffie (1984) establishes a contrasting view of the relationship between financial development and economic growth. Result explores the role of the informal financial market which influences the real sector. The study suggests that when formal financial sector widens, a required reserve ratio of financial sector increases that leads the scarce in the liquidity for curb market. This creates the credit crunch which retards the growth of the real sector.

There are many studies in the role of financial development and economic growth in different context and countries' cases. We cover some recent studies focusing on how the sector is getting priorities in the literature after 1990.

Jeremy Greenwood & Boyan Jovanovic (1990) explored financial intermediaries channelize the resources for development. Management of the huge size of the fund at a low cost for long run investment accelerates the economic development. Research-based on Pareto optimization methodology suggests that the extent of financial intermediation and economic growth are determined within the system. Both are the endogenous variables. Financial intermediation boosts the economic growth facilitating the high return on investment, economic growth, in turn, manages the ground for high valued finance. The inseparable relationship between financial development and economic growth leads to a higher level of growth.

Arestis & Demetriades (1995) conducted the research to find the relation between financial development and economic growth. They used the cross-country regression and time series method to estimate the macro variables of different countries and received the result where financial development leads the economic growth. In concern of methodology time-series data for individual country shows more consistent result then cross-country regression method.

Levine (1997) empirically finds a strong positive relationship between the financial system and long-run economic growth. It applies from the micro level to the macro level. Industrialization needs to invest the huge fund for a long period. A financial market that trades the varieties of securities motivates the individual savers to hold such assets and channelizes the liquid funds for the efficient entrepreneur. The industrial revolution was the result of 'liquidity transformation'.

Besides, change in information and technology, political and legal provision, and policies cause the change in the financial system. The author studied the previous findings and interpreted.

Becker & Thorbjørn Knudsen (2002); Bernanke & Gertler (1989); Rousseau (2002) argued Joseph Schumpeter first introduced the relation between financial development and economic growth, formally. He showed the role of financial development in economic growth. Before the time, the role of finance was ignored. Efficient financial intermediation plays a crucial role in the development process. It reduces the information cost, risk and time. Entrepreneur invents the new procedure, technology which is efficient than old. It is the way of development.

Ang & McKibbin (2007) researched Malesia using the time series data for the period 1960 to 2001. Research has applied the unit root test and used the co-integration method. The result showed a positive relationship between financial development and economic growth. Result supported the demand following hypothesis. Financial growth followed economic growth. Financial widening, deepening were the consequences of economic growth.

Perera & Paudel (2009) enquired the relationship between financial development and economic growth using the time series data from Sri Lanka for 1955 to 2005. Major six indicators of financial development are used to analyze. Unit root and co-integration tools of econometrics were applied. Granger causality test observed the causal relationship between financial development and economic growth. Result partially supported the claim financial development leads the economic growth.

Adelakun (2010) explored the relationship between financial development and economic growth in developing country Nigeria. Econometrically, the Ordinary Least Square Estimation Method (OLSEM) was used to analyze the data. The result showed the financial development has a strong positive role in economic growth. The Granger causality test revealed the financial development accelerates the economic growth, at the same time evidence of causality showed the economic growth promotes financial intermediaries. In conclusion financial development, including financial diversification serves economic growth.

Estrada, Donghyun & Ramayandi (2010) find the positive effect of financial development in economic growth. Analyzing the panel data of 125 countries they suggest developing and expanding the financial entities for sustainable development. This phenomenon is empirically justified in developing country Shri Lanka, Bangladesh, Nigeria, Nepal (Adelakun, 2010; Mahmoudzadeh, Sadeghi, & Sadeghi, 2013; Perera & Paudel, 2009; Shrestha, 2005).

Gautam (2012) examined the relationship between financial development and economic growth in Nepal using the time series data of 1975 to 2012. The researcher has used the unit root test and the co-integration test. Granger causality test was fitted to examine the causal relation. Using these methodological tools researcher concludes there is a strong relationship between financial development and economic growth. Still, this empirical evidence could not suggest which of them leads the economy. Further research is essential.

Ram (2013) found contrary to the usual claim, 'negative covariance' between financial development and economic growth. Empirical evidence from the data of 95 individual countries approved this phenomenon. Individual country's correlation contrast with cross country data. Individual country multiple regression also could not support the positive relationship between financial development and economic growth. Overall results from different tests suggest the weak, even negative association between financial development and economic growth.

Beck, Levine, & Popov (2018) suggest that financial sector generates the multiplier effect on the economy. Empirically it was noticed since the eighteenth century. In England, Bank was established in 1750. During the industrial revolution of England, banking sector paced the industrial sector. Old technology replaced by new, productivity increased, quality of goods and services improved. A new sector of industry and business explored. This process is known in the literature as 'creative destruction'.

3.2 Nepalese context

The role of financial development in economic growth has not much discussed in the context of Nepal. However, we find some studies related with the financial sector of Nepal. For example, Paudel (2005) analyzes the financial system to find out the positive relationship between financial system and economic growth. The major variables used to capture the financial system are narrow money and broad money, bank credit and monetary aggregates. Shrestha (2005) develops a financial liberalization index and examines the role of financial liberalization in economic growth of Nepal to find the positive impact of financial liberalization that strengthens the financial development.

Bhetuwal (2007) also studies on financial liberalization issues of Nepal and suggest that the financial liberalization contributes to improve the financial system which may be followed by a simultaneous growth in all the sectors of the economy. Gautam (2014) investigates the relationship between financial development and economic growth in Nepal using the annual data for the period of 1975-2012 and recommends for a consolidate financial system to cope with the emerging changes such as post crisis resilience and sustainability.

From this a brief literature survey of financial development in the case of Nepal, we see that the area of research in the field remains. As we see that not much focus is given in the financial development, rather to financial liberalization. Even, in the case of financial development, the issue of limited proxy to measure the financial development is there. Therefore, this field needs further contribution using a systematic method of analysis and employing updated data and methodologies for the wider group of the proxy variables of the financial development so that a solid role of entire financial development in economic growth can be assessed.

IV. RESEARCH METHODOLOGY

Financial development is the result of the positive change in many combined areas of the financial sectors. There are no unique measures of financial development in the literature. However, various research works have taken different economic variables as a proxy of the financial development. Recently, Svirydzenka (2016) introduced a new broad-based index of financial development of 183 countries. This index has three broad indicators: financial market depth, financial market access and financial market efficiency. According to this index Switzerland tops for first two indicators and the United States for the third indicator. The countries like Antigua & Barbuda, St. Kitts and Nevis and Bahamas, The stand at the bottom for respective indicators. It provides the aggregate impact, rather we want to estimate a broad range of financial development indicators. Therefore, we could not follow this single index for our study.

Data availability issue of the best suited variables in the context is one of the major problems in this regard. Particularly, time series data for financial development activities and variables in the developing countries is always a challenging issue. Most common variables in this field of research include and that we use in this study are follows. The broad money measures the overall supply of money into the financial sector, a popular proxy variable for financial development is used in this study too. Domestic credit provided by banking sector refers to the credit availability to the business sector that can contribute to the overall financial development. These both variables have been used in the model. Overall, domestic credit provided to business sector in the economy, helps to understand the credit utility in the private sector, indicates the finance absorbing capacity of the economy. Therefore, it has been used as another proxy of financial development. Foreign direct investment and gross capital formation other two proxies for financial development used in this study. These all proxies are denoted as financial development measures, which has been replaced in the place of FD in the model, are as below:

FDM1= Broad money to GDP (BROADMGDP in dataset)

FDM2= Domestic credit to private sector to GDP (DCRPRVGDP in dataset

FDM3=Domestic credit by banking sector to GDP (DCBSECGDP in dataset)

FDM4= Gross capital formation to GDP (GCFGDP in dataset)

FDM5= Foreign direct investment to GDP (FDINFLGDP in dataset)

Our main research question is: *does the financial development contribute to the economic growth in Nepal?*

4.1 The model, variables, and data

Our benchmark growth model is developed as in equation (1) based on Solow Swan growth model and the discussion in Guerrini (2006). GDP per capita growth (GDPPCG) is used as the dependent variable, which measures economic growth. The main variable of our interest is financial development (FD) that we go through 5 measures as discussed earlier. It is because there is not such single variable to represent the financial development. Our intention doing this is to capture as much as possible areas of the financial development to make a credible analysis. The other controlled variables in the model are the trade openness (OPENNESS) to capture the impact from trade openness and policy dynamics, and the number of working aged population measured as the per cent of the total population (LWAGEPOP) to know the impact of demographic dividend on economic growth.

This study uses the secondary data collected from World Bank Group (2019a) for econometric estimation. The data are annual data for the period of 1965-2018. The functional form of the model is as below:

$$\mathrm{GDPPCG} = \mathrm{f}(\mathrm{FD}, \mathrm{OPENNESS}, \mathrm{WAGEPOPPC})$$

Where,

GDPPCG = GDP per capita growth measured in per cent,
FD is represented by five measures in different model as:
BROADMGDP = Broad money (% of GDP)
DCBSECGDP = Domestic credit by banking sector (% of GDP)
DCRPRVGDP = Domestic credit to private sector (% of GDP)
FDINFLGDP = Foreign direct investment (% of GDP)
GCFGDP = Gross capital formation (% of GDP)
OPENNESS = Trade openness measured by total trade (% of GDP)
WAGEPOPPC = Working aged population (% of total population).

Model will be designed as

$$GDPPCG_t = \alpha + \alpha_1 FD_t + \alpha_2 OPENNESS_t + \alpha_3 WAGEPOPPC_t + u_t \quad \ldots\ldots\ldots (1)$$

Where $t = 1965$ to 2018,
α is an intercept and α_1, α_2, and α_3 are coefficients of the relevant variables.
FD is replaced in each equation by those five proxies of financial development.

4.2 Unit Root Tests

The unit root test in the time series data, particularly, when mixed of GDP related and other variables, is an essential step. It is because the series might be integrated in different order. In that case, the estimated results may have the possibility of being infirmity or incredible if the appropriate method is not adopted to address the issue during the econometric estimation. Therefore, we conduct the unit root tests using augmented Dickey Fuller (ADF) and Phillips and Perron (PP) tests. The test results are obtained assuming the presence of a unit root (non-stationary variable) in the null hypothesis (H0) and the variable has no unit root (stationary variable) is an alternative hypothesis (H1). Whether the variable is H0 or H1 is determined based on the calculated statistics and McKinnon's critical value. This refers that if the calculated statistic is higher than McKinnon's critical value, the H0 is not rejected and considered the variable is non-stationary (has a unit root). If the calculated value is lower than McKinnon's critical value, then the variable is stationary (does not have a unit root). In this process, we observe the value in level and then the first difference including the intercept and time trend to make tests more flexible. The specification is as in the equation (2).

$$\Delta \boldsymbol{Z_t} = \boldsymbol{\alpha_1} + \boldsymbol{\alpha_{2t}} + \boldsymbol{\gamma Z_{t-1}} + \sum_{j=1}^{k} \boldsymbol{\beta_j} \Delta \boldsymbol{Z_{t-j}} + \boldsymbol{\varepsilon_t} \quad \ldots\ldots\ldots (2)$$

Where, Δ is the first difference operator, $\boldsymbol{\alpha_1}$is intercept, $\boldsymbol{Z}$ is the variable, $\boldsymbol{t}$ is the time trend, $\Delta \boldsymbol{Z}$ is the augmented term, $\boldsymbol{k}$ is the appropriate lag length of the augmented terms, and $\boldsymbol{\varepsilon}$ is the error term. The unit root test is the test of the significance of the coefficient, i.e., $\boldsymbol{\gamma}$. We, looking the sample size reasonably small, use maximum lag length $\boldsymbol{k = 4}$ with the Schwartz-Bayesian Criterion (SBC). In this process, as some variables are detected as I (0) and rests as I(1), we use Auto Regressive Distributed Lag (ARDL) approach of cointegration as developed in Pesaran et.al (2001).

Table 1 and 2 present the unit root tests results. We detect GDPPCG as I(0) and rest of the variables are I(1).

Table 1: **Unit Root Tests Results at Levels**

Variables	Tests with Constant		Test with constant and trend	
	ADF	PP	ADF	PP
GDPPCG	-8.02*	-8.32*	-7.60*	-10.52*
BROADMGDP	4.85	4.67	-1.15	-0.51
DCBSECGDP	1.50	2.10	-1.14	-1.20
DCRPRVGDP	2.74	2.96	0.45	0.71
FDINFLGDP	-0.18	-0.03	-2.51	-2.58
GCFGDP	1.29	2.51	-1.38	-0.95
WAGEPOPPC	-1.35	-1.43	-4.43*	-0.96
OPENNESS	-1.39	-1.37	-0.40	-0.32
Critical value @ 5% level of significance	-2.94	-2.94	-3.53	-3.52

Source: Authors' calculation based on used database for econometric estimation
Note: * Indicates stationary at 5 per cent level of significance.

Table 2: **Unit Root Tests Results at First Difference**

Variables	Tests with Constant		Test with constant and trend	
	ADF	PP	ADF	PP
BROADMGDP	-5.79*	-5.78*	-5.64*	-11.35*
DCBSECGDP	-5.10*	-5.10*	-5.58*	-5.85*
DCRPRVGDP	-4.35*	-4.59*	-5.40*	-5.41*
FDINFLGDP	-6.42*	-6.66*	-6.31*	-6.52*
GCFGDP	-5.65*	-6.19*	-6.31*	-6.52*
WAGEPOPPC	-3.12*	-3.18*	-4.15*	-4.36*
OPENNESS	-2.98*	-3.04*	-3.68*	-3.71*
Critical value @ 5% level of significance	-2.94	-2.94	-3.53	-3.52

Source: Authors' calculation based on used database for econometric estimation
Note: * Indicates stationary at 5 per cent level of significance.

4.3 Econometrics

The variables included in the equation (1) will be analyzed using a co-integration test based on autoregressive distributed lag (ARDL) approach (Paudel, R. C., & Kankesua, 2009; Pesaran, Shin, & Smith, 2001). The ARDL approach of co-integration is widely used because this approach solves the problem of stationary and allows to estimate the mix of variables, such as, I (0) and I (1) variables. Furthermore, it addresses the problems in the estimation due to the presence of serial correlation between the explanatory variables. These features of time series

data, co-integration is established as a strong statistical tool to analyze the time series data.

The ARDL version of Equation (1) is presented below:

$$\Delta GDPPCG_t = \beta + \beta_1 GDPPCG_{t-1} + \beta_2 FD_{t-1} + \beta_3 WAGEPOPPC_{t-1}$$
$$+\beta_4 OPENNESS_{t-1} + \sum_{i=1}^{54} \gamma_i \Delta GDPPCG_{t-i} + \sum_{i=1}^{54} \delta_i \Delta FD_{t-i}$$
$$+ \sum_{i=1}^{54} \theta_i \Delta WAGEPOPPC_{t-i} + \sum_{i=1}^{54} \varphi_I \Delta OPENNESS_{t-i} + v_t \quad \ldots\ldots\ldots (2)$$

Equation (2) captures the dynamic impact in the form of Auto Regressive Distributed Lag Model. In the model, Δ stands for the first order differential variable. β is intercept, β_1, β_2, β_3 and β_4 are the coefficients of first order variables. Similarly, γ_i, δ_i, θ_i and φ_I are the parameters of error correction model, and v_t is vector of random error.

4.4 Results and discussions

Tables 3, 5,7,9 and 11 present the long-run relationship results for the growth models with our five financial development measures. In all these tables, the F-statics (Bound) results show that the values are higher than that of upper bound of the critical value indicating that in all cases the long run relationships exist.

These tables show the long-run coefficients of ARDL with different lags as shown in their headings for the given model. The results show that FDM1(Broad money to GDP ratio in percentage term) has a strong long-run relationship indicating that a one percent increase in FDM1 causes to increase the per capita GDP growth on average by about 0.10 percent holding other variables constant in the model (Table 3). The results for FDM2 (the ratio of domestic credit from private sector to GDP in percentage) show almost similar results indicating the strong association with economic growth in a positive direction (Table 5). The results for FDM3 (the ratio of domestic credit from banking sector to GDP in percentage) has strong relationship with per capita GDP growth at almost similar magnitude (Table 7). The results for FDM4 (the ratio of gross capital formation to GDP in percentage) also shows strong association impacting the per capita GDP growth by about 0.20 percentage (Table 9). The final financial development measure in our model-FDM5 (the ratio of foreign direct investment to GDP in percentage) does not seem to have statistically significant impact in economic growth, however, it has a correct sign with larger coefficient and standard error (Table 11).

The results for trade openness seem very ambiguous and difficult to conclude. Therefore, we say that we did not detect the strong association of trade openness with per capita GDP growth. In one case it suggests that it has a negative impact in the long run but not statistically significant, in another case it has a strong

negative association with per capita GDP growth. In another case, while we include FDM5 in the model, we detect strong positive association with economic growth.

Against the normal expectation, it can be summarized from all long run relationship tables that the working aged population share in total population measured in percentage-the proxy of the labor force- has negative impact in per capita GDP growth by almost half percentage on average. However, the results for working aged population is not surprising in the country with heavy outmigration, brain drain and politically unstable country. This was the story in Africa region during the lost decades. The difficulty with the poor nations in this era is that they invest a lot on working aged people in many respects including education, health and infrastructure and they migrate for the better opportunities in the advanced countries. The host countries, in fact, have opportunities for talent hunts from the developing countries. This result of working aged population is consistent with the finding about the labor force as of Paudel and Shrestha (2006).

Overall, the results for our main variables of interest are consistent and the results suggest that major indicators of financial development have a positive significant impact in the economic growth of Nepal.

Similarly, Tables 4, 6, 8, 10, and 12 present the short-run dynamics' results for those five models. In all cases, we find ECM_{t-1} statistically significant with expected negative sign indicating the disequilibrium that occurred in the previous period is corrected in the present period following a short-run shock in a quicker pace if the coefficients are closed to one. We see the ECM (-1) results which is statistically significant as expected and has a negative sign as expected indicating that the adjustment is a bit slow in case of disequilibrium. Normally, most of the studies have found these results between -0.01 to -1 but there are few cases ECM (-1) has reached up to -2 as discussed in Loayza & Ranciere (2004). Here, if the ECM (-1) coefficient is -1.95, it suggests that the readjustment for any disequilibrium in the economy takes about two years.

The per capita GDP growth of the previous period seems important for the growth of next year, i.e., the short -run impact is statistically significant. Trade openness is statistically significant in the short-run and has positive association with one period lag in most of the cases. A notable point is that the trade openness has much stronger positive impact with economic growth in the short-run compared to that of the long-run. Therefore, we cannot completely ignore the role of trade openness.

The post estimation tests in all long-run relationship tables show reasonably high R-squared value indicating that overall goodness of fit of the model is high. The F-statistic measures the joint significance of the regressors in the model and

statistically highly significant. The reported DW statistics tests in almost all cases are closed to the desired value, 2. Overall, the diagnostic test results show that the models pass the test for serial correlation, functional form, normality and heteroscedasticity. Also, the stability test results (CUSUM and CUSUMSQ) plotted against the critical bounds of 5 percent level of significance are within the range, with exception in Figures 6a and 6b where the boundary seems about 6 percent level, indicating that the model is structurally stable (Figures 3a, 3b, 4a, 4b, 5a, 5b, 6a, 6b, 7a and 7b).

Table 3: **Long run coefficients ARDL (2,1,2,0), dependent variable: GDPPCG**

Regressor	**Coefficient**	**Standard error**	**T-ratio [Prob]**
BROADMGDP	0.10	0.02	4.28[0.000]***
OPENNESS	-0.03	0.06	-1.27[0.211]
WAGEPOPPC	-0.56	0.19	-2.92[0.006]***
INPT	30.64	10.66	2.88[0.006]***
Observations	54	R-squared	0.63
Time trend	No	DW –Statistics	2.04
		F-Stat.	F(8,41)
F-statistics (Bound)	20.36		5.68[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 4: **The ARDL (2,1,2,0) model ECM results, dependent variable: ΔGDPPCG**

Regressor	**Coefficient**	**Standard error**	**T-ratio [Prob]**
ΔGDPPCG1	0.45	0.13	3.44[0.001]***
ΔBROADMGDP1	-0.05	0.09	-0.51[0.611]
ΔOPENNESS	0.09	0.09	1.03[0.310]
ΔOPENNESS1	0.23	0.09	2.47[0.018]**
ΔWAGEPOPPC	-1.10	0.39	-2.78[0.008]***
ECM_{t-1}	-1.96	0.21	-9.21[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 5: **Long Run Coefficients ARDL (2,1,2,0) Dependent variable GDPPCG**

Regressor	**Coefficient**	**Standard Error**	**T-Ratio [Prob]**
DCRPRVGDP	0.15	0.03	4.64[0.000]***
OPENNESS	-0.05	0.03	-1.71[.094]*
WAGEPOPPC	-0.86	0.24	-3.60[0.001]***
INPT	48.48	13.53	3.58[0.001]***
Observations	54	R-squared	0.78
Time Trend	No	DW - Statistics	2.03
F-Statics (Bound)	20.37	F-Stat (6,43)	24.33[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 6: **The ARDL (2,1,2,0) Model ECM results, Dependent variable: ΔGDPPCG**

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
ΔGDPPCG1	0.45	0.13	3.5014[0.001]***
ΔDCRPRVGDP	0.07	0.09	0.80388[0.426]
ΔOPENNESS	0.06	0.09	0.66594[0.509]
ΔOPENNESS1	0.22	0.09	2.3900[0.021]**
ΔWAGEPOPPC	-1.73	0.51	-3.4168[0.001]***
ECMt_1	-2.01	0.21	-9.5122[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 7 : **Long Run Coefficients ARDL(2,1,2,0) Dependent variable GDPPCG**

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
DCBSECGDP	0.15	0.03	4.57[0.000]***
OPENNESS	-0.04	0.03	-1.68[0.000]***
WAGEPOPPC	-0.87	0.24	-3.56[0.000]***
INPT	48.78	13.77	3.54[0.000]***
Observations	54	R-squared	0.78
Time Trend	No	DW - Statistics	2.06
F-Statics (Bound)	21.29	F-Stat (6,43)	24.07[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 8 : **The ARDL(2,1,2,0) Model ECM results, Dependent variable: ΔGDPPCG**

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
ΔGDPPCG1	0.45	0.13	3.46[0.001]***
ΔDCBSECGDP	0.08	0.09	0.84[0.411]
ΔOPENNESS	0.06	0.09	0.66[0.513]
ΔOPENNESS1	0.21	0.09	2.35[0.023]**
ΔWAGEPOPPC	-1.74	0.51	-3.38[0.002]***
ECMt_1	-2.01	0.21	-9.45[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 9 : **Long Run Coefficients ARDL(2,0,0,0) Dependent variable GDPPCG**

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
GCFGDP	0.19	0.04	3.96[0.000]***
OPENNESS	0.00	0.02	-0.06[0.952]
WAGEPOPPC	-0.19	0.12	-1.67[0.100]*
INPT	9.38	6.21	1.51[0.138]
Observations	54	R-squared	0.75
Time Trend	No	DW - Statistics	2.17
F-Statics (Bound)	22.2	F-Stat (5,44)	26.61[0.000]

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 10 : **The ARDL(2,0,0,0) Model ECM results, Dependent variable: ΔGDPPCG**

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
ΔGDPPCG1	0.39	0.13	3.09[0.003]***
ΔGCFGDP	0.30	0.08	3.69[0.001]***
ΔOPENNESS	0.00	0.04	-0.06[0.952]
ΔWAGEPOPPC	-0.37	0.23	-1.64[0.107]
ECMt_1	-1.92	0.21	-9.1329[.000]***

Note: ***, ** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 11: **Long Run Coefficients ARDL (2,0,0,0) Dependent variable GDPPCG**

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
FDINFLGDP	0.88	1.47	0.60[0.551]
OPENNESS	0.06	0.02	2.98[0.005]***
WAGEPOPPC	0.15	0.10	1.47[0.150]
INPT	-8.90	5.89	-1.51[0.138]
Observations	50	R-squared	0.68
Time Trend	No	DW - Statistics	1.92
F-Statics (Bound)	12.55	F-Stat (5,44)	18.46[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Table 12: **The ARDL (2,0,0,0) Model ECM results, Dependent variable: ΔGDPPCG**

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
ΔGDPPCG1	0.28	0.14	1.98[0.0501]**
ΔFDINFLGDP	1.45	2.40	.60[0.549]
ΔOPENNESS	0.09	0.04	2.68[0.010]***
ΔWAGEPOPPC	0.25	0.18	1.44[0.157]
ECMt_1	-1.64	0.22	-7.34[0.000]***

Note: ***,** and * indicate that the statistics are significant at 1%, 5% and 10% level of significance.

Figure 3a

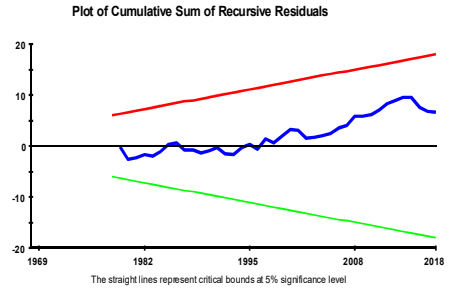


Figure 3b

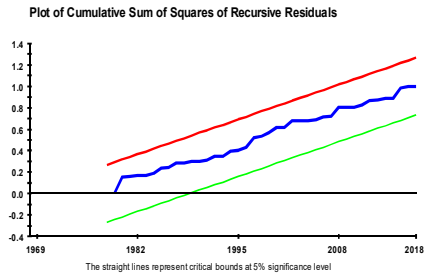


Figure 4a

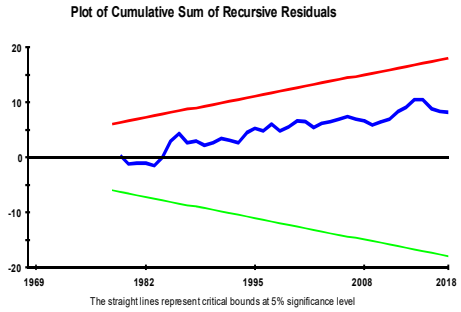


Figure 4b

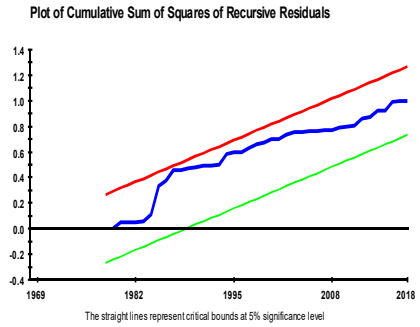


Figure 5a

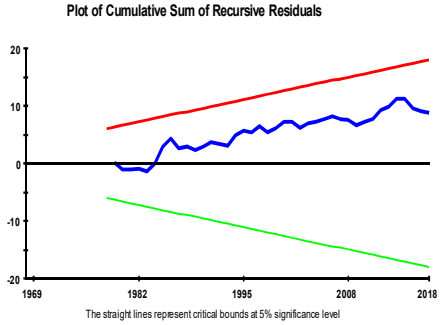


Figure 5b

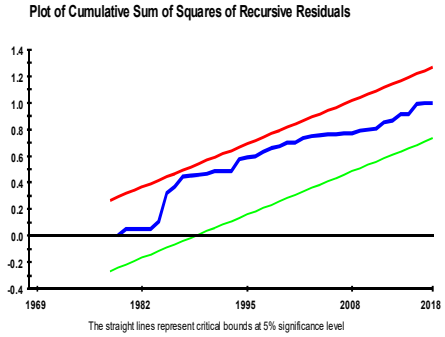


Figure 6a

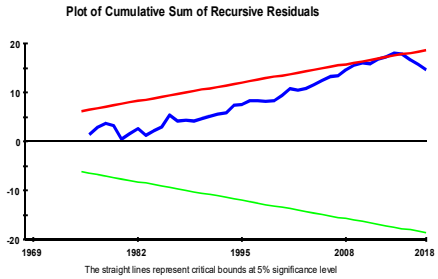


Figure 6b

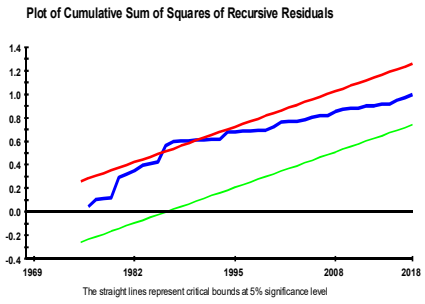


Figure 7a

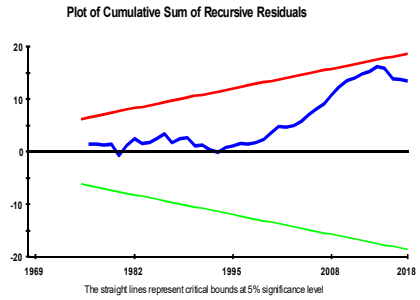
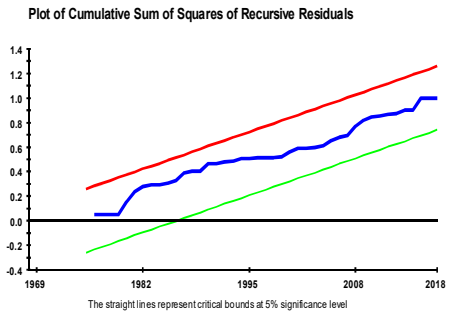


Figure 7b



V. CONCLUSIONS

This study has made a brief analysis of financial system and examined the role of overall financial development in economic growth using the longest possible time series data from Nepal covering the period of 1965-2018 employing an advanced time series analysis method- Autoregressive distributed lag approach of cointegration. Also, during this process, we analyze the properties of time series data to make the results more credible so that a good policy inferences is made.

As discussed in the methodology section, we use five measures of financial development capturing the relevant areas of financial system that are directly related with financial development in the literature. These measures include; percentage of broad money to GDP (FDM1), percentage of domestic credit to private sector to GDP (FDM2), percentage of domestic credit by banking sector to GDP (FDM3), percentage of gross capital formation to GDP (FDM4), and percentage of foreign direct investment to GDP (FDM5). Also, we include trade openness (OPENNESS) and percent of working aged population of the total population (LWAGEPOP) as the control variables in the model.

We estimate the model to identify the long-run and short-run relationship among the dependent and independent variables. The results show that financial development indicators-Broad money, domestic credit to private sector, domestic credit from banking sector almost similarly and significantly contribute to the economic growth. The gross capital formation shows the stronger role in economic growth whereas the foreign direct investment does not seem statistically significant in economic growth. Trade openness (OPENNESS) seems to have ambiguity as the result varies with the use of the financial development measures. It shows the positive and statistically significant impact on growth while foreign direct investment is controlled in the model. The working aged population

(LWAGEPOP) variable has a negative impact in the economic growth against the normal expectation.

These results are consistent with Africa region's lost decade story. In conclusion, the key finding is that the financial development supports the economic growth. Therefore, it may be a way to extend financial activities to boost the economic growth in Nepal. A challenge to the policy makers in the country is to determine how the financial sector can contribute to develop the most productive sectors of the economy.

This study has some limitation. We use the different variable as suggested by literature for financial development. Instead, we could develop an index of financial development following Svirydzenka (2016) for more credible analysis that will help to know the more aggregate impact of financial development.

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