Financial Development and Economic Growth Nexus

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This paper attempts to examine the nexus between finance-growth by endegenizing economic- growth, financial-development, fixed gross capital, foreign direct investment, total trade, population and remittance for Nepal during the period from 1981-2021. Using ARDL, there exists evidence of co-integration among the variables used in the model, ased on ARDL model and causality test, suggests that there is long run relationship and log run adjustment in short run. Furthermore, the result also point out that fixed gross capital and total trade are not contributed to achieve economic growth in the Nepalese context. Both the stability diagnostic and residual diagnosis test indicates that the estimation is free from spurious form.

***Keywords**: Finance-Growth, Co-integration, Causality, ARDL, Economic Growth, Nexus*

1. Introduction

Economists have held the different perspectives on the theoretical approach in the nexus between financial development and economic growth (finance-growth). As assumed by the endogenous growth model, financial system boost economic growth by switching funds from unproductive to wealth generating uses and this role of financial system can be spotted back to Schmpeter (1911). Banks and financial institutions (BFIs), an integral part of financial system are key for attaining the economic growth because of collecting scattered amounts, encouraging the innovations and making efficient use in productive sector and Goldsmith (1969), McKinnon (1973) and Shaw (1973) provided the early evidences on this argument. Since the endogenous growth theory, the performance of financial development on the economic growth has received more attention. Asian financial crisis in 1997/98, Global financial crisis 2007/8 and frequently observing the liquidity crisis have raised a more concern among the policy formulators and researchers on the reliability and stability of emerging financial system.

Following to Levine (1997), we believe that financial intermediaries (BFIs) helps to achieve the economic efficiency and growth, through allocating fund in productive uses. In the context of Nepal, number of institutions

expanded tremendously from seven banks and financial institutions to around two hundred and fifty in 2010 phase including microfinance, an increase by over thirty three times (Maskay & Pandit: 2010) and currently it has decreased to 127 after enacting the merger and acquisition law in 2016, but branches are increasing about 11398 (NRB: 2021). Nepal as the banks dominant market, based on the endogenous growth model, higher lending because of high access of banking services increase the economic growth, therefore, the concern remains whether there exist causality and co-integration between the finance and growth.

There is lack of consistency (mixed) in the outcome regarding the relation between financial development and economic growth. Many earlier empirical studies in same arena, for instance, Ang and McKinnon (2007); Abu-Bardar and Abu-Qarn (2008), Hassan, et. al. (2011); Durusu et al. (2017); Chong (2012); Zhang et al. (2012); Ibrahim and Alagidede (2018) found that there is positive effect of financial sector development in economic growth. However, Shen and Lee (2006); Cecchetti and Kharroubi (2012); Rioja & Valev (2014); Hook and Sing (2014), spotted the adverse impact of financial sector on economic growth. Hung, (2009); Hu, et al. (2019); Murinde, (2012), found the non-linear in the finance-growth nexcus. Similarly, Gries et al. (2009); Stalbov (2017); Erdogan et al., (2020) found the low relation between the finance-growth. Nguyena et. al. (2017), reported the reverse causality between the finance-growth relations. More recently Soedarmono, et. al. (2017), Samargandi, et. al. (2015); Fidrmuc and Ghosh (2015) presented that financial development have Inverse U-shaped relationship with economic growth.

Nepal has a very interesting facts on this study for mainly two angles i.e it has a long history of financial sectors reforms dating back to the early 1981s and at the same time, there were a series of financial restructuring events for the betterment of financial system of nation. Recently after Asisan crisis and global crisis, monetary and fiscal instrument were focused more and this was assumed by restructuring the both corporate and banking sectors. Although the financial environment has changed, not study has yet been able to look closely at and document the impact of these financial matters on the financial system specifically with the reference of Nepalese context. In earlier studies based on Nepalese context Paudel & Acharya (2020); Gautam, (2014); Paudel (2020); Maharjan (2020); Khatri Cheetri (2022) researchers have analyzed the finance-growth causality based on bank and market parameters, however in this paper, we have applied the purely bank based parameter for the proxy of financial development. Similarly, other empirical studies such as Samargandi et. al. (2015); Stolbov (2017); Ibrahim & Alagidede (2018); Zhang (2012); Murinde (2012); Wu et al., (2020) are on the association between finance-growth and these studies are based on the cross country study, however this paper based on Nepalese context only.

The reminder part of the study is arranged as follows. Section 2 represents the empirical literature on finance-growth nexus in relevant context. Section 3 represents the methodological approach applied in this study. Section 4 addresses the outcome of the empirical analysis. Section 5 possesses the concluding remarks of the outcomes.

2. Literature Review

Ang, and McKibbin, (2007), shows that financial liberalization has a favourable effect in stimulating the economic growth contrary to the conventional findings and supported the Robinsons's view of the development of financial sector is what drives expansion. Hung, (2009) found the nonlinear relationship

between the finance-growth relationships based on empirical study. Samargandi, et al., (2015), re-examined the association between the financial development and economic growth of fifty two middle income countries covering the period of 1980-2008, and found that there is inverse U-shaped relation in the log run and negative effect in the short run based on the pooled mean group method. Gries et al. (2009), find that financial deepening has no strong role in increasing the economic growth based on Hsiao-Granger method and this is based on the sixteen Saharan African countries where marginal effect is low.

Stolbov, (2017), examined finance-growth based on threefold methodology (VAR, Breitung-Candelon & FMOLS), the findings didn't support that the financial development moves from a supply-leading to demand following pattern ad economic development proceedings. However, idiosyncratic country determinants also appears significant. Hu, (2019), analyzed finance-growth in the context of large economy, there is non-linear relationship between financial efficiency and economic development and efficiency promotes the growth up to certain threshold and decreases the collection and investment after exceeding the threshold. Durusu-Ciftci et al. (2017), based on Solow-Swan empirical approach, both long term source of financing debt and equity are the determinants of the GDP per capita and outcome of Augmented Mean Group (AMG) and Common Correlation Effect (CCE) revealed that there is long run effect on steady state level of GDP per capita and impact of credit market is sustainably larger. Ibrahim and Alagidede (2018), spots that under a certain estimated threshold, financial development is low sensitive to growth rather it is more sensitive to the economic growth for those countries exceeding the threshold and suggests long-term growth requires higher levels of finance, income, and human capital.

Hassan et. al. (2011), in the context of low and middle income countries, there is mixed result i.e reverse causality in most of the result in short term and positive impact in the long run and concludes that appropriate financial system is necessary but not sufficient conditions t achieve the steady state growth in developing economy. Choong (2012), in the context of developed country, domestic financial system is theprerequisite for FDI to a significant favourable impact on economic growth. Based on GMM, FD plays a significant linkage between the FDI and economic growth. Arestis et. al. (2001), the role of banking system and stock market volatility in between financial debelopment and economic growth, there is the strong supports finance leads to growth

Wolde-Rufael (2009) reports that neither the supply-lending nor the demand-following hypothesis are supported in the Kenya context and there exists the causality and reverse causality between the finance-growth based on quad-variate vector auto regressive where liquid liabilities has no effect on the economic growth out of four variable used i.e. broad money supply, domestic bank credit to private sectors and total domestic credit by the banking sectors. Bumann et. al. (2013), based on the systematic study of earlier empirical literature on effect of financial development and economic growth (meta-analysis), most of the study presented that there is significant effect in achieving the economic growth. Additionally, most of the variable that helped to explain the heterogeneity in the result found insignificant. Shahbaz, et. al. (2022) by focusing on the asymmetric effect and financial literacy on economic growth, there is the presence of threshold asymmetric co-integration among the variables three regime threshold. In the upper regime, it to boost the economic growth and vice-versa in the lower regime and middle regime, it helps to maintain the growth based on the threshold

auto-regressive distributed lags model (TADL).

Zhang, et al., (2012) in the case of city level in china, the result reveled the contrary to the existing conclusion that state-ruled banking sector hinders the economic growth rather China WTO has in right tract after following the financial liberalization policy. Owen, and Temesvary, (2014), explors the heterogeneity in the finance-growth nexus by making comparision the effect of foreign and domestic credit. Based on the mixture model, foreign own lenders have the hindrance in achieving economic growth rather than locally owned lenders in the context of underdeveloped and developing country. Wu, (2020), in the context of major Asian economics Chaina, Japan and India, there is no co-integration rather there is short run causality among the variables. Based on the bootstrap auto-regressive distributed lag, additionally, the regulatory body monitors the credit performance to state-owned enterprises and observe the input-output process of financial resources in order to improve the financial efficiency and thereby, robustly contribute in achieving economic growth. Okuyan, (2022), in the developing country context, there is mixed outcome; causality financial development leads to economic growth and economic growth leads to financial development (bidirectional causality) finance and there is no impact at all on some sample country, so the result concluded that no valid for every country.

As empirically presented by Murine, (2012) with the more emphasizes on flow of fund story, the result shows that financial development consisting both institutions and market and their key role in minimizing the risk of information asymmetric and risk of pricing, is key component for uplifting the economic growth. Also new evident offers an important insights into mechanism at which financial development induces economic growth, including emerging work on corporate finance alongside works that teases out and application for the purpose of inter-generational income distribution and poverty allievtion. AbuBader, and AbuQarn, (2008), in the context of developing countries MENA, in five out of six, the empirical evidence strongly confirms financial development leads to economic growth. Although, there is some evidences of reverse causality but there is no evidence that the relationship runs other way.

3. Methodology.

3.1 Financial Development (FD)

Nepalese financial market has dominated by bank based (German-Japanese model) rather capital market system and small and medium enterprises have the significant contribution tto the Nepalese economy. A majority of the business firms are not listed in financial market and BFIs are the major source of collecting the debt for financing purpose, so Nepalese financial system is assumed as bank based system, therefore we have used the bank based financial parameters as the proxies of financial development. Similarly, resolving the issue of reliability and spurious outcome, researcher used other variables as the controlling variables typically stated in the growth literature, Ang and McKibbin (2007); Hassan, et al., (2011); Durusu et al., (2017); Choong (2012); Zhang et al., (2012); Ibrahim and Alagidede (2018); Cecchetti and Kharroubi (2012); Rioja &Valev (2014); Hook and Singh (2014), Stalbov (2017); Erdogan et al., (2020) i.e. gross fixed capital (GFC) to account the outflow in physical assets, openness to total trade (TT) for capturing the significance of external factors in influencing economic activities, population (Pop) as an indicators of addressing the growth of labor force, foreign direct investment (FDI) for controlling the effect of external capital inflow on the growth and

remittance (RMT) to capture the effect on saving because Nepal, has the significance portion of remittance on GDP.

Formation of financial development index is a complex task in the banking sector because banks are offering the different services and frequently new financial product are lunching in the banking system. Formerly, M2 to GDP used as the proxy, but it reflect only extent of transactions and as a proxy to foreign money in financial system, but it presents only the monetary aggregates (Fidrmuc, and Ghosh, 2015). In many cases, study variables are highly associated and yet there is no uniform variables for representing financial development and economic system. As the bank based financial system, we have used the liquid liability in terms of GDP, domestic lending by banking sectors in terms of GDP and domestic lending to private sectors in terms of GDP because the basic idea behind these measures is that lending is in profitable productive sectors and therefore clients make efficient use of landings. Based on these three variables, we applied principal component analysis to develop a measure of financial development and as suggested by Ang, and McKibbin (2007), this assists to deal with the issue of multicollinearity and over parameterization in the model.

Table 1: *Principal Component Analysis for FD.*

	PCA 1	PCA 2	PCA 3
Eigenvalues	2.734	0.202	0.064
% Variance	0.911***	0.067	0.002
Cumulative %	0.911	0.978	1.000
Variables	Vec. 1	Vec. 2	Vec. 3
A	- 0.543	0.486	-0.592
B	- 0.537	-0.762	-0.183
C	- 0.564	0.284	0.671

Note: *A; logarithm of liquid liability in terms of GDP, B; logarithm of domestic lending by banking sectors in terms of GDP and C; logarithm of domestic lending to private sector in terms of GDP.*

In table 1, we have presented the outcome of PCA, where eigenvalues indicate that the first principal component analysis (PCA-1) explained around 91% variation, similarly second component analysis (PCA-2) and third component analysis (PCA-3) explained around 6% and 0.2% respectively. It is clear that first principal component, which has explained high variation in the outcome variable than other linear combination of independent variables, we belive that this is the best measure of FD in the Nepalese context. After re-scaling, the individual contribution of variable A, B and C in the explanatory power of PCA are 0.3302 or 33.02%, 0.3266 or 32.66% and 0.3432 or 34.32% respectively, so researcher has used as weights to form a financial development index denoted by FD.

3.2 Data sources

This study has used the data covering from 1981 to 2021 A.D. The data were collected from the Ministry of Finance, Nepal Rastra Bank economic survey and World Bank data statistics. Due to the unavailability and reliability of the data, researcher has applied data since 1981 because Nepal started the following financial liberalizartion policy initially at 1980/81, under the liberal economic policy of HMG/N (Shresth, 2004) and based on Chow-Lin method, all the annual data have classified into semiannual

data, which increased the number of observation and address the data richness issue in the model (Chow, 1976). All the values are measured in terms of logarithm (log-log model) so that they can be interpreted in percentile terms.

3.3 Econometric Approach.

Based on the arguments presented in previous section, researchers have followed the following functional approach for examining causality among conjectured constructs, where financial development (FD) is the explanatory variable and similarly, foreign direct investment (FDI), remittance (RMT), population (Pop), total trade (TT) and fixed gross capital (FGC) are the controlling variables in this study.

RGDP = f (FD, FDI, RMT, Pop, TT, FGC)

This empirical analysis has two objectives, i.e. how the variables are related in long run and to analyze the causal relation among the applied variables. We constructed seven variable ARDL model for the prediction in this study. The proximity of the outcome is then checked and verified by applying three standard measure for FD. As presented by Wu, (2020), an Auto-regressive distributed lag model serves the prediction well because of many reasons, i.e. ARDL address the endogeniety issue by dealing all applied variables potentially endogenous in the model, establishing the proper size and power properties in the test values and in the macroeconomics matter, current values are autoregressive or affected by last period value which isn't address in dynamic manner. Researchers followed the three step procedure for empirical study. With begin by examining the stationary (invariant mean, variance and co-variance) in data, researcher applied the unit root test (ADF and PP) procedure. Secondly, for confirming the presence of long term nexus among the variables, researchers applied bound test for co-integration thirdly if association in long run existed, then testing the causality employing ARDL model.

Chapter 4: Empirical Findings

Unit Root Test:

Researchers tested stationary of the data at the first by using the Augmented Dickey Fuller (ADF) test. Following to Dickey and Fuller (1979), if the data are non-stationary at I (0), then ADF test is executed on the first difference of X (i.e. ΔX) and suggest to go for first order and If the is found to be stationary, then the series is said to be integrated to order I (1).

Table 1: *Result of Unit Root Test (ADF) Procedure.*

Variables	At Level or I(0)		At First Difference or I(1)		O. I.
	Intercept	Trend & Intercept	Intercept	Trend and Intercept	
LnRGDP	0.0860	-1.8186	-6.2446***	-6.2540***	I(1)
	(0.9607)	(0.6769)	(0.0000)	(0.0000)	
FD	0.3879	-1.9189	-7.6307***	-7.9346***	I(1)
	(0.9800)	(0.6261)	(0.0000)	(0.0000)	
LnRMT	-0.4593	-2.0373	-7.0973***	-7.0010***	I(1)
	(0.8886)	(0.5637)	(0.0000)	(0.0000)	
LnFGC	-1.0505	-1.9183	-5.9987***	-5.9724***	I(1)

	(0.7256)	(0.6264)	(0.0000)	(0.0001)	
LnFDI	0.7647	-0.9367	-4.2745***	-4.2076***	I(1)
	(0.9921)	(0.9412)	(0.0017)	(0.0090)	
LnPop	-3.5412***	-4.7556***	- 7.8901***	-7.9803***	I(0)
	(0.0076)	(0.0026)	(0.0000)	(0.000)	
LnTT	-1.2185	-1.9623	-4.3943***	-4.3088***	I(1)
	(0.6570)	(0.6035)	(0.0012)	(0.0078)	

Table 1, shows the unit root test outcome(ADF; Augmented Dickey Fuller) of real gross domestic product (RGDP), financial development (FD), foreign direct investment (FDI), remittance (RMT), population (Pop), total trade (TT) and fixed gross capital (FGC). All variables except population have no invariant mean, variance and covariance at level. We tested the stationary at the first difference, by Augmented Dickey Fuller test and all variables found stationary at first order at which their respective p-values are less than 0.05 or 5% and found I(0) and I(1). As applied Murthy, & Okunade, (2016) and Garza, (2019), the variables are stationary at I(O) and I(1), so researchers used ARDL co-integration to show whether the association among the variables is in long run or not.

Optimum Lag Length Selection: As suggested by Rahaman, & Ksahem (2017), optimum lag address the residual correlation and finds the better fit model or yields the efficient estimators and is an explicit statistical criterion. In most economic analysis, determining the auto-regressive process for a time series is a key econometric exercise.

Table 2: *Optimal Lag*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	251.5470	NA	4.28e-15	-13.21876	-12.91399	-13.11131
1	555.5986	70.94002*	4.63e-21	-31.18489*	-24.56718*	-28.82110*
2	643.4278	104.4456	7.64e-22	-27.00533	-24.53268	-26.14577
3	730.9205	476.6215	2.38e-22*	-29.10421	-24.47999	-27.49253

*Indicates lag order selected by the criterion,

Table 2, shows the result of optimal lag length selection, where optimal lag length is one. As per Akaike information criterion (AIC), Schwarz information criterion (SC), Sequential modified (LR) and Hannan-Quinn information criterion (HQ) suggests that optimal number of lag is one. However, as per Final prediction error (FPE), the optimal lag length is three. Following Thiede, et al., (2005), most of the tests (LR, AIC, SR, HQ) have suggested at lag one, so this study has followed one lag.

Co-integration and Long Run Coefficient: As stated earlier, this study has intended to examine the existence of relationship between the finance-growths in long run. We have applied ARDL co-integration test for detecting whether the variables used in the model are moving together or not. In most of the economic matter specially in developing

econmy, most of the earlier paper i.e. Meo, et al., (2018); Fareed, et. al., (2018); Ha, & Ngoc (2021); Aslam, & Sivarajansingham, (2020); Garza-Rodriguez (2019) applied ARDL for estimating the robust parameter and considering the contextualization facts, we applied ARDL in the same economic matter specially in developing economics Nepal.

LnRGDP = C(1)*LnRGDP(-1) + C(2)*LnFD + C(3)*LnFD(-1) + C(4)*LnFDI + C(5)*LnFDI(-1) + C(6)*L,nPOP + C(7)*LnPOP(-1) + C(8)*LnFGC + C(9)*LnFGC(-1) + C(10)*LnTT + C(11)*LnTT(-1) + C(12)*LnRMT + C(13)*LnRMT(-1) + C(14).

ARDL Long Run Form and Bound Test

Dep Var. : D (LnRGDP)

Selected Model: ARDL (1, 1, 1, 1, 1, 1, 1)

Table 3

Long Run Form & bound test

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	98.1066	23.951	4.0961	0.0004***
LnRGDP (-1)	0.7481	0.2119	3.5303	0.0016***
LnFD (-1)	8.0981	3.7368	2.1671	0.0400***
LnFDI (-1)	0.9795	0.0774	12.640	0.0000***
LnFGC (-1)	2.4000	3.9080	0.6141	0.5447
LnPop (-1)	5.7693	1.3954	4.1345	0.0004***
LnTT (-1)	-2.2117	4.6585	-0.4747	0.6391
LnRMT (-1)	0.7796	0.0842	9.2511	0.0000***
D(LnFD)	4.8745	2.7310	1.7848	0.0864
D(LnFDI)	0.0348	0.5786	0.0602	0.9524
D(LnFGC)	0.6850	2.7441	0.2496	0.8049
D(LnPop)	14.730	8.9550	1.6449	0.1125
D(LnTT)	-0.8124	3.4871	-0.2329	0.8177
D(LnRMT)	0.0786	0.1052	0.7471	0.6410

Levels Equations				
Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistics	Prob.
LnFD	10.8244	5.2500	2.0618	0.0498***
LnFDI	13.0937	1.2149	10.777	0.0000***
LnFGC	3.2079	5.5412	0.5789	0.5678
LnPop	7.7116	1.9723	3.9099	0.0006***
LnTT	-2.9563	6.5520	-0.4512	0.6557
LnRMT	1.0421	0.1184	2.0618	0.0000***
LnFD	131.13	5.2500	10.777	0.0498***

F-Bound Test

Test Statistics	Value	Sig	I(0)	I(1)
F-statistic	**4.4410**	10%	1,99	2.94
k	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	**3.99**
Actual Sample Size	79	Finite Sample: n = 80		
		10%	2.218	3.314
		5%	2.618	3.863
		1%	3.505	5.121
		Finite Sample Size: n = 75		
		10%	2.254	3.388
		5%	2.685	3.960
		1%	3.731	5.326

The calculated F-value is 4.44which is above the upper and lower level bound test. The critical value of upper bound is 3.99 at 1%This means that the null hypothesis if no co-integration relationship can be rejected which implies that real GDP is co-integrated with real gross domestic product (RGDP), financial development (FD), foreign direct investment (FDI), remittance (RMT), population (Pop), total trade (TT) and fixed gross capital (FGC) and So there is a long run relationship between the variables. Therefore there existed long run relationship among the variables. Based on the outcome of F-Bound test, following co-integration equation (CE) model has formed.

CE = LnRGDP - (10.8244*LnFD + 13.0937*LnFDI + 3.2079*LnFGC + 7.7116*LnPop - 2.9563*LnTT + 1.0421*LnRMT + 131.13)

Error Correction Form for Short Run Coefficient and Long Run Adjustment.

Similarly, we examined the short run relationship among the study and control variables. Some papers have shown that there is short run association among the variables used in the study. Following to MacDonald & Taylor (1994), we applied to error correction form model to confirm whether there exist the short term relation and adjustment in long run. Based on the F-bound test and Co-integration equation result, it is confirmed about the relation.

Table 4: *Result of Short Run Coefficient*

Levels Equations Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistics	Prob.
D(LnFD)	4.8745	1.8196	2.6789	0.0129***
D(LnFDI)	0.0348	0.3234	0.1078	0.9150
D(LnFGC)	0.6850	1.4641	0.4678	0.6439
D(LnPop)	14.730	2.7816	5.2955	0.0000***
D(LnTT)	-0.8124	1.8092	-0.4490	0.6573
D(LnRMT)	-0.0078	0.0755	-0.1042	0.9178
CointEq(-1)	-0.7481	0.1109	-6.7436	0.0000***
R-Square	0.5690			
Adj.R-Square	0.4882			
D-W test	2.2396			

F-Bound Test

Test Statistics	Value	Sig.	I(0)	I(1)
F-Statistics	**4.4410**	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	**3.99**

Table 4, shows the result of calculated F-value which is 4.44 and it is the upper-lower level bound test. Since the parameter of upper bound is 3.99 at 1% significance level, meaning that the null hypothesis of no co-integration relationship can be rejected, which implies that real GDP is co-integrated with real gross domestic product (RGDP), financial development (FD), foreign direct investment (FDI), remittance (RMT), population (Pop), total trade (TT) and fixed gross capital (FGC) and So, there is a long run relationship among the variables. Therefore there existed long run relationship among the variables. The CointEq(-1), is negative with a coefficient of -0.7481. This implies that the speed of adjustment towards long run equilibrium 0.75% or system corrects its previous period disequilibrium at a speed of 0.75% within one period of time. The t-statistic -6.7436 and coefficient is significant.

Residual diagnosis test

According to Gries, T., & Redlin, M. (2020), researchers checked goodness-of-fit statistics and ran diagnostic tests to make the estimated model robust and unbiased. Researchers have checked the heterocedaticity, multicollinarity, normality and serial correlation for confirming the violation of estimation assumptions.

Table 5; *Result of Residuals Diagnostic Test.*

Particulars	Obs-R^2 (P-Value)
Heteroscedasticity BPG test	10.3461 (0.7863)
BG serial correlation LM test	4.87692 (0.1467)
Normality JB test	JB-2.1145 (0.3217)

In Table 5, shows the result of residual diagnostic test, where B-G serial LM test, presents that the residuals are free from serial correlation since p-value observed R-square is 0.1467. Similarly, B.P.G. presents the homoscedastic residuals since p-value of observed R-square is 0.7863 and Jarque Bera test presents result of normality since the P-value is 0.3217, all three measures are more than 5% or 0.05. Similarly VIF factor of all coefficient are less than 5, so there is no strong correlation among the explanatory variables and all satisfies the assumptions.

Ramsey RESET Test

This is regression specification error test, researcher used to look for both omitted variables in the model and inappropriate functional form of the model (Hukur, & Mantalos, 2004). This is based on Lagrange Multiplier approach, F-test is used for accepting the working statement. Following model has derived for the Ramsey RESET test.

Specification: *LnRGDP LnRGDP(-1), LnFD LnFD(1), LnFDI LnFDI(-1), LnFGC LnFGC(-1) LnPop LnPop(-1) LnTT LnTT(-1) LnRMT LnRMT(-1*)

Table 6

	Value	df	Prob.
t-statistic	1.6879	74	0.0967***
F-statistic	2.1347	(1, 74)	0.1237***
Likelihood ratio	2.3126	1	0.1189***

Table 6, shows the result of Ramsey RESET test, where the values of t-stat, F-stat and likelihood ratio are insignificant since their P-value is greater than 5%. In the stability diagnosis test, the model has free from the special error or the model is well specified and there is the appropriate functional form of model.

CUSUMs test: The cumulative sums (CUSUMs) figure shows the cumulative sum of variation of every sample from its target value. As specified by Koshti, (2011), researchers have applied this test is to check whether a process is veering off the mean or not.

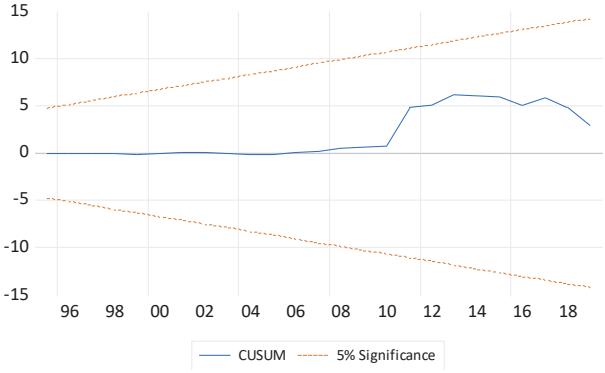

Figure 1: Result of CUSUM test

Figure 1, shows the result of CUSUM stability test. The plots of CUSUM remained between the 5% critical bounds, which proved the stability of the parameters. The line is in between two line or this line has not exceeded the two line or critical bound, so the model is structurally stable and model is best fitted.

IV. Conclusion

In this study, researchers attempted to address the difficulty of presenting the financial development by applying Principal Component Analysis (PCA) to form a efficient representative measures. This formed index covers the major proxies of financial development in the developing financial system based on the suggestion in the literature. Based on auto-regressive distributed lag model and controlling the key

determinant of economic development experienced in the Nepalese economy, findings supported that there is long run nexus between the finance-growth in Nepal

As mention in the methodology section, we have used six measures of economic growth that captures the more relevant areas of financial development in the literature. These variables covers financial development (FD) the explanatory variable and similarly, foreign direct investment (FDI), remittance (RMT), population (Pop), total trade (TT) and fixed gross capital (FGC) are the controlling variables in this study. We estimated the ARDL; Long run and Bound test, this showed that there is long run relationship between financial development, foreign direct investment, remittance, population and economic growth, however there no contribution of fixed gross capital and total trade to economic growth which is the normally against of the growth theory. Nepal is experiencing the negative balance of payment (BOP) since long back, or it has significantly low export as compared to its import, so total trade may not have strong contribution in the economic growth. Similarly, in the context of Nepal, investment in the capital nature assets is also low because SMEs have the key contribution in the economy, and small and medium-sized enterprises (SMEs) require low capital assets in manufacturing process, a low investment in capital assets leads a low output and low exports are a result of low investment in capital assets these may be the reason of no contribution. Similarly, we also examined the short run relation among the variables, where most of the variable found insignificant. There is no more strong impact on the economic growth in short run. However, population has the significant impact on the economic growth even in the short run, so the result is consistent with the theoretical argument. In conclusion, the key finding is that financial development affects the economic growth in the Nepalese context.

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