Bank-Based Financial Development and Economic Growth in Nepal

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Abstract

The study of causal relationship between Nepal's economic growth and bank-based financial development was carried out by using time series data since 1964. The Granger causality test was applied to measure the causality between the bank-based financial development and economic growth. The proxy variable for bank-based financial development are: private sector credit by Banks and Financial Institutions to GDP, bank deposits mobilized by BFIs to GDP, inflation – an indicator for macroeconomic stability. Inflation is also a variable inserted to cater omitted variable in this study. The objective of the research and findings are: private sector credit by Banks and Financial Institutions to GDP and bank deposits mobilized by BFIs to GDP do not cause economic growth individually but including, inflation – an indicator for macroeconomic stability and a variable inserted to cater omitted variable in this study, causes economic growth. Economic growth causes bank deposits to increase. Economic growth does not cause private sector credit to increase. Similarly, gross capital formation also contributes to economic growth in Nepal.

Keywords*:* bank deposits, economic growth, gross capital formation, inflation, private sector credit, supply leading theory,

Introduction

The growth of financial sector in Nepal over the last three decades is outstanding. The number of banking institutions, insurance businesses, and financial market along with other financial agents has grown enormously. There is general recognition that financial development contributes to real economic growth. However, as empirically found, their contribution to Gross Domestic Product is noticeably low. Financialisation of the economy does not link to real sector of the economy. Nevertheless, empirical

reassessment and reorientation of the finance-growth relation shall be remade especially in the low income countries, like Nepal. It helps trace the drift and re-establish the linkage, if any.

The age-old questions of whether banking systems promote economic growth or the other way around have been debated at least since the 1800s. The banking industry has a critical role in fostering technological innovation and profitable investment, both of which are ultimately responsible for economic progress, according to Schumpeter (1912). Robinson (1952), in contrast to Schumpeter (1912), contends that financial development impacts financial market development rather than the other way around. According to Robinson (1952), as economies expand, so does the need for financial services, which fuels the expansion of financial systems.

According to the supply-leading hypothesis, one factor influencing economic growth is financial deepening. According to Hurlin & Venet (2008), the development of the financial sector leads to the best possible allocation of resources. It implies that there is no reciprocal relationship between economic growth and finance in terms of causality. The development of the financial sector is a prerequisite for economic expansion. According to Mckinnon and Shaw (1973), a well-developed financial sector improves financial intermediation by minimizing transaction and monitoring costs as well as asymmetric information. (Adeyeye, P. O., et.al. 2014) finds that the presence of a robust financial sector fosters the development of financial services and increases their availability ahead of demand from the economy's real sector players. It is assumed that as the real sector grows and is supported by financial development, the economy reacts.

Robinson (1952) introduced the demand-following theory, a counterargument to the supply-leading hypothesis, arguing that economic development is a prerequisite for financial deepening. It is a component of the growth-led or demand-following finance theory, which postulates a causal relationship between financial development and economic growth. As the economy grows, there is a greater need for financial services, which expands the financial sector (Calderón & Liu, 2002). According to Singh (1999), as an economy grows, macroeconomic activity increases and the financial sector grows as a result.

Patrick (1966) proposed an extra layer to the relationship between economic expansion and financial deepening. The "stage of development" idea is a combination of the supply-leading and demand-following theories. It suggests that as the economy grows, there will be alternating causal links between financial development and economic growth. When an economy is just getting started, the supply-leading hypothesis is true; but, as the economy develops, it disappears and the demand-following hypothesis takes over (Adeyeye, et.al. 2014). Potential factors influencing the banking system's credits to the private sector include financial depth, bank credit to the government, privatization, general progress towards market institutions, and the caliber of laws protecting creditors' rights. Other factors include inflation, real GDP growth, real interest rates, fiscal expansion, property prices, and interest rate spreads.

Various studies conducted in different countries have analyzed the linkages between financial development and economic growth covering bank-based and market-based financial development over the last two centuries. Though, the empirical results remain divergent and lacked consensus. Bank-based and market-based financial development are two further categories under which Nepal's financial development falls. Nepal's financial system is largely reliant on banks, with a developing capital market. This study focuses on bank-based financial development and economic growth in Nepal because banks have a dominant influence on the country's financial landscape. The stocks of banks and financial institutions have the significant dominance in the capital market. Their role in money market, deposit mobilization and credit allocation is vital that is expected to contribute strengthening finance-growth relations. The ratio of bank deposits to GDP and private sector credit to GDP are measures of financial development based on banks. The system has been adjusted to account for variable omission by introducing inflation.

The bank-based financial development is one of the channels that may affect economic growth in Nepal. The level of private sector credit as compared to GDP measures financial depth of the economy. The ratio of loans to private sector entrepreneurs is at the same level of total yearly output of the Nepali economy. Likewise, as bank deposit to GDP ratio increases, financial depth also increases thereby contributing to economic growth. It is computed as the ratio of all checking, savings, and time deposits in banks and bank-like financial institutions to economic activity. It

serves as a stock indication of the deposit resources available to the financial sector for its lending activities.

The specific goals are to determine the relationship between bank-based financial development and economic growth in Nepal, investigate whether financial development and economic growth in Nepal are driven by supply or demand, and assess the factors influencing economic growth in Nepal with a particular emphasis on bank-based financial development.

By offering empirical evidence on the direction of causality between bank-based financial development and economic growth in Nepal—where bank-based financial development has been proxied by the ratio of private sector credit and deposits of the licensed banks and financial institutions to GDP—this study contributes to the body of knowledge on bank-based economic growth. The goal of this study has been to determine the exact nature of causality between Nepal's economic growth over the last five years and bank-based financial development.

Methodology

This study's primary goal is to determine the relationship between Nepal's economic growth and bank-based financial development. The private sector credit provided by deposit money banks or BFIs to GDP (PC/GDP), bank deposits to GDP (BD/GDP), and inflation, as shown by the annual percentage change in consumer price indices, are the three main components of the bank-based financial development indicators. The annual percentage change in real GDP serves as a gauge of economic growth (constant 2011 US$); in Nepal.

The secondary sources are where the data was gathered. The Global Financial Development Database (2016), which can be accessed online, contains the private credit by deposit money banks to GDP (PC), bank deposits to GDP (BD), and inflation, which is measured by the annual percentage change in consumer price indices. The National Bureau of Budget (NRB) calculated Nepal's annual percentage change in real GDP (constant 2011 US dollars) to determine the country's economic growth from 1964 to 2015.

The Dickey-Fuller generalized least squares (DF-GLS) and Augmented Dickey-Fuller (ADF) tests have been used to investigate the stationary characteristics of the bank-based financial development and economic growth indicators. The Toda-Yamamoto test has then been used to determine if bank-based financial development and economic growth are causally related.

Granger Causality has been tested with the Toda-Yamamoto Test (Toda & Yamamoto, 1995). The traditional method of testing for causality, which calls for testing for stationarity and cointegration, has been shown to be susceptible to pretesting bias by Toda and Yamamoto (1995). He and Maekawa (1999) provide evidence in favor of this viewpoint by stating that tests of causality would yield erroneous results if one or both time series were non-stationary. The problems associated with the conventional test for causality may be overcome by fitting an augmented VAR model, which adds the highest order of integration of the variables to the optimal lag of the VAR model. The associated test statistic for the causality test would have a typical asymptotic distribution based on this VAR model.

Specification of the Model

The study has identified three independent variables and one dependent variable with the scope of granger causality which have been included in the regression equation based on theoretical considerations. The fundamental model is;

Economic Growth = f(Bank-based Financial Development) ..... (1)

$Y_t = f(F_t, Z_t)$ ..... (1.1)

Where,

Y_t= annual percentage change in real GDP.

F_t = measure of the level of bank-based financial development indicators.

Z_t = vector of other factors regarded as inputs in the process measured by inflation.

t = denotes the time period.

Applying it in our model, it would be as follows;

$GDP_t = f(BD_t, PC_t, INF_t)$ ..... (1.2)

Where,

GDP_t= annual percentage change in real GDP.

BD_t = BFIs deposits to GDP (BD/GDP_t).

PC_t = private sector credit by deposit money banks or by BFIs to GDP (PC/GDP_t).

INFt = inflation, measured by annual percentage change in consumer price indices.

Using the Toda-Yamamoto approach, a modified vector autoregressive model, (m +), is used to evaluate Granger causality will have the following form in accordance with Yamada (1998) and Ho & Iyke (2016).

$$GDP_t = \gamma_0 + \sum_{i=1}^{m} \gamma_{1i} GDP_{t-i} + \sum_{i=m+1}^{m+d\max} \gamma_{2i} GDP_{t-i} + \sum_{i=1}^{m} \varphi_{1i} PC_{t-i} + \sum_{i=m+1}^{m+d\max} \varphi_{2i} PC_{t-i} + \sum_{i=1}^{m} \varphi_{3i} BD_{t-i} + \sum_{i=m+1}^{m+d\max} \varphi_{4i} BD_{t-i} + \sum_{i=1}^{m} \varphi_{5i} INF_{t-i} + \sum_{i=m+1}^{m+d\max} \varphi_{6i} INF_{t-i} + u_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

$$PC_t = \theta_0 + \sum_{i=1}^{m} \theta_{1i} PC_{t-i} + \sum_{i=m+1}^{m+d\max} \theta_{2i} PC_{t-i} + \sum_{i=1}^{m} \delta_{1i} GDP_{t-i} + \sum_{i=m+1}^{m+d\max} \delta_{2i} GDP_{t-i} + u_{2t} \ldots\ldots(2)$$

$$BD_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i} BD_{t-i} + \sum_{i=m+1}^{m+d\max} \alpha_{2i} BD_{t-i} + \sum_{i=1}^{m} \lambda_{1i} GDP_{t-i} + \sum_{i=m+1}^{m+d\max} \lambda_{2i} GDP_{t-i} + u_{3t} \ldots\ldots(3)$$

$$INF_t = \beta_0 + \sum_{i=1}^{m} \beta_{1i} INF_{t-i} + \sum_{i=m+1}^{m+d\max} \beta_{2i} INF_{t-i} + \sum_{i=1}^{m} \pi_{1i} GDP_{t-i} + \sum_{i=m+1}^{m+d\max} \pi_{2i} GDP_{t-i} + u_{4t} \ldots\ldots(4)$$

Where, GDPt, PCt, BDt and INFt denote the variables; γ, φ, θ, δ, α, λ, β, and π denote the coefficients; u1, u2, u3, and u4 denote the iid error terms. dmax denotes the highest order of integration of the variables.

From equation (1), PC_t, BD_t and INF_t cause GDP_t if $\varphi_{1i} \neq 0$, i =1,2,…,m. Similarly, in equation (2), GDP_t causes PC_t if $\delta_{1i} \neq 0$, i =1,2,…, m. In equation (3), GDP_t causes BD_t if $\lambda_{1i} \neq 0$, i =1,2,…,m. In equation (4), GDP_t causes INF_t if $\pi_{1i} \neq 0$, i =1,2,…, m.

The associated test statistic of these hypotheses is Chi-square distributed. Suppose that if $\delta_{1i} = 0$, i =1,2,…,m, and let δ = Vec (δ_1, δ_2, ... , δ_m) denote a vector of mVAR coefficients. According to Toda Yamamoto (1995), for a suitably selected Z, the modified Wald-statistic for this hypothesis takes the following form

$$W = T(\hat{\delta}' Z' (Z \hat{\sum}' uZ')^{-1} Z \hat{\delta})$$

Where $\hat{\delta}$ is the OLS estimate of δ; $\hat{\sum}'u$ denotes a consistent estimate of the variance-covariance matrix of $\sqrt{T}(\hat{\delta}-\delta)$; T denotes the sample size. W, which is the test statistic, is Chi-squared distributed with m degree of freedom.

All of the above data are from GFDD of WB because of wider acceptability of data. The data is on http://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database) accessed in 11 July 2018.

Results and Disussions

Inflation represents real sector, monetary sector, fiscal sector, financial sector and external sector variables' performance in the macro-economy. Inflation causes economic growth significantly. Similarly, overall model under consideration jointly causes economic growth. It proves that Nepal is on the path of Supply-leading finance-growth nexus. Though, interest variable, namely; Private sector credit and Bank deposits by deposit money banks (or BFIs) individually do not affect economic growth. It helps conclude that other than bank-based variable affect economic growth. Likewise, economic growth affects Bank Deposit but economic growth does not affect Private sector Credit and inflation.

Economic Growth does not Granger cause Bank Deposit. Bank Deposit, inflation and Economic Growth jointly affect or Granger cause Private sector Credit but not individually. Private sector Credit Granger causes Bank Deposit. Inflation does not Granger cause Bank Deposit. Private sector Credit, inflation and Economic Growth jointly Granger cause Bank Deposit. Inflation is not caused by private sector credit, bank deposits, or economic growth either separately or in combination. Credit from the private sector does not necessarily lead to economic growth. Growth in the economy is not caused by bank deposits. So their relation is unidirectional running from Economic Growth to Bank Deposit and not vice versa. Inflation Granger causes Economic Growth. Private sector Credit, Bank Deposit and inflation jointly Granger cause Economic Growth.

Economic Growth, Inflation and Private sector Credit individually Granger cause Bank Deposit at 5% level of significance. Bank Deposit also does not Granger causes Inflation and Private sector Credit. Bank Deposit does not Granger cause inflation but

inflation does. Inflation Granger cause Economic Growth but Economic Growth does not Granger cause inflation. Economic Growth also does not Granger causes Private sector Credit. Bank Deposit, Economic Growth and Inflation jointly do not Granger cause Private sector Credit. Private sector Credit does not Granger cause inflation. Private sector Credit does not Granger cause Economic Growth. Bank Deposit, Economic Growth and Private sector Credit jointly do not Granger cause inflation.

The Hypothesis developed and tested above reveals the following results.

Hypothesis	Statement	Prob. Value	Decision
H_1	Private sector credit by deposit money banks (or BFIs) to GDP (PC) causes economic growth.	0.7115	Reject
H_1	Bank deposit to GDP (BD) causes economic growth.	0.8647	Reject
H_1	Inflation (INF) causes economic growth.	0.0005	Accept
H_1	Overall model under consideration causes economic growth.	0.0125	Accept

The use of Granger causality test developed by Toda and Yamamoto (1995) to measure the causality between the bank-based financial development and economic growth in Nepal is helpful to evaluate the real-financial linkage. Inflation, an indicator for macroeconomic stability, causes economic growth significantly. The proxy for bank-based financial development-Private sector credit (PC) by the BFIs to GDP and Bank deposits (BD) mobilized by the BFIs to GDP do not affect economic growth.

Overall model under consideration causes economic growth. Considered all variables jointly, Nepal follows supply-leading economic growth. Gross Capital Formation significantly contributes to economic growth in Nepal. Bank deposit and Private sector credit individually do not cause economic growth but the model jointly causes economic growth indicates that growth can be attained from joint efforts of stakeholders. Similarly, bank deposit and economic growth do not affect private sector credit that suggests the need of establishing causal nexus for sustainability of financial

sector and attach the banking system with mainstream growth course of the economy. The main source of economic growth for Nepal seemed capital formation. Banks and financial institutions shall also work more proactively on capital formation and economic growth in Nepal.

Conclusions

Private sector Credit does not Granger cause Economic Growth and Economic Growth does not Granger cause Private Sector credit. Economic growth is not a cause of bank deposits, nor does bank deposit growth create economic growth. It concludes that neither Demand-following theory nor Supply-leading theory of Growth explains Finance-Growth nexus in Nepal. Private sector credit and Bank deposit do not contribute on Economic growth. So, bank-based financial activists shall contribute more for economic growth. Naturally, gross capital formation seems critically important for supporting economic growth in Nepal.

Economic Growth, Inflation and Private sector Credit jointly and individually influence Bank Deposit indicating the strong contribution of economic activities and developmental activities to the Nepalese banking sector's resource mobilization. There is no impact of Economic growth, Bank deposit and Private sector credit, individually as well as jointly, on inflation. Similarly, bank deposit, inflation and economic growth do not affect private sector credit. Inflation Granger causes Economic growth but Economic growth does not Granger cause inflation. Private sector credit, Bank deposit and inflation jointly Granger causes Economic growth. This relation jointly supports supply-leading theory that shows the significance of the bank-based financial development on the economic growth.

Based on the results, it has been concluded that bank-based financial development indicators, Private sector credit and Bank deposit, individually do not play an important role in economic growth but all variables jointly play an important role in economic growth. In Nepal, bank-based financial development; along with gross capital formation and human capital development, determine economic growth.

Policy Recommendations

Bank deposit and Private sector credit individually do not cause economic growth but the model jointly causes economic growth indicates that growth can be attained from joint efforts of stakeholders. Similarly, bank deposit and economic growth do not affect private sector credit that suggests the need of establishing causal nexus for sustainability of financial sector and attach the banking system with mainstream growth course of the economy. The main source of economic growth for Nepal seemed capital formation. Banks and financial institutions shall also work more proactively on capital formation and economic growth in Nepal.

Conflict of Interest Statement

The author declared no conflict of interest.

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Annex: Nexus of Financial Development and Economic Growth

Year	EG	PC	BD	INF
1964	1.9	1.3	2.2	9.5
1965	-1.2	1.5	2.2	8.7
1966	7.0	1.7	2.1	14.1
1967	-1.6	1.9	2.5	-2.8
1968	0.7	1.9	2.7	1.4
1969	4.5	2.1	3.1	4.0
1970	2.6	2.5	3.9	15.1
1971	-1.2	3.3	4.8	-1.9
1972	3.1	3.5	5.6	8.5
1973	-0.5	4.1	7.3	11.2
1974	6.3	4.2	7.1	19.9
1975	1.5	4.0	6.5	7.6
1976	4.4	3.7	8.0	-3.1
1977	3.0	4.1	10.7	10.0
1978	4.4	4.8	11.3	7.3
1979	2.4	5.5	11.8	3.5
1980	-2.3	7.2	13.6	14.8
1981	8.3	8.1	14.0	11.1
1982	3.8	8.2	15.2	11.7
1983	-3.0	8.0	17.5	12.4
1984	9.7	7.4	16.9	2.8
1985	6.1	8.0	16.7	8.1
1986	4.6	9.2	17.6	19.0
1987	1.7	9.7	17.9	10.8
1988	7.7	9.9	18.3	9.0
1989	4.3	11.3	19.6	8.8
1990	4.6	11.7	20.3	8.2
1991	6.4	12.1	20.9	15.6
1992	4.1	12.3	21.0	17.1
1993	3.8	13.3	22.5	7.5
1994	8.2	15.4	23.4	8.4
1995	3.5	19.6	24.9	7.6
1996	5.3	21.6	25.5	9.2
1997	5.0	21.5	25.6	4.1
1998	3.0	25.1	29.9	11.1
1999	4.4	26.6	32.5	7.5
2000	6.2	27.7	35.2	2.5
2001	4.8	27.3	35.8	2.7
2002	0.1	26.4	37.8	3.0
2003	3.9	25.1	38.6	5.7

2004	4.7	25.4	39.3	2.8
2005	3.5	26.5	39.9	6.9
2006	3.4	28.5	40.8	6.9
2007	3.4	32.1	44.2	5.8
2008	6.1	36.5	48.4	9.9
2009	4.5	45.7	55.0	11.1
2010	4.8	51.3	58.1	9.3
2011	3.4	50.1	58.8	9.3
2012	4.8	51.7	61.9	9.5
2013	4.1	53.8	65.2	9.0
2014	6.0	56.5	68.4	8.4
2015	2.7	56.7	69.0	7.9
2016	0.4	69.6	79.9	9.9
2017	8.9	68.4	76.4	4.4
2018	7.6	76.2	83.0	4.1
2019	6.6	78.8	85.8	4.6
2020	-2.4	87.7	103.1	6.1
2021	4.2	105.3	109.5	3.6

Source: http://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database