



# Economic Growth, Public Expenditure, and Infrastructure on Provincial Financial Development of Nepal

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## Abstract

**Purpose:** Financial development is inevitable to finance the domestic resources in the development of Nepal at the provincial level. This paper intends to evaluate the nexus of financial development at the provincial level with economic growth, public expenditure, and infrastructure.

**Design/Methodology/Approach:** The targeted variables—financial development is a proxy by branches of banks and financial institutions and other regressors—economic growth (a proxy by annual growth in gross domestic product), public expenditure (proxied by current and capital expenditure), infrastructure (proxied by road networks, number of schools, electricity production) are considered throughout 2019 to 2023 across the seven provinces of Nepal. A fixed effect panel data model (FEM) is taken to estimate the intended outcome. To check the heteroscedasticity, autocorrelation, and cross-sectional dependency (CD), the CD test and Panel-Corrected Standard Errors (PCSE) are regressions that are also performed.

**Findings:** The stylised facts, as a whole, indicate that the growth nexus has had a negative impact. However, infrastructure exerts a more significant influence on the financial development of Nepal's provinces. Additionally, combined public spending that is neither capital nor current has helped advance financial development in the provinces.

**Value/Originality:** The results of the study highlight the necessity of prioritising infrastructure improvements and effective combined public spending to support financial development in Nepal's provinces. It offers unique insights not previously explored in Nepalese academia. Updated and relevant data are collected and applied to the different channels to evaluate the nexus of financial development at the province level of Nepal.

**Recommendation:** Policymakers should give due consideration to the effective mobilisation of fiscal resources with proper fiscal discipline in every aspect. Moreover, enhancing the allocation of development finance has the potential to stimulate financial development across all areas herein examined.

**Keywords:** economic growth, public expenditure, infrastructure, financial development, fixed effect model

**JEL classification:** H54, H72, G21, O47, C33

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## Introduction

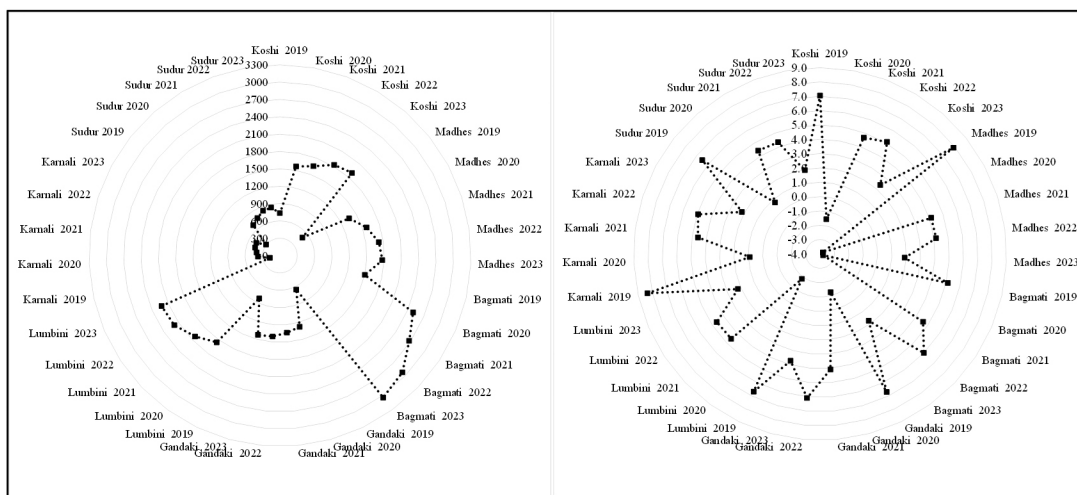
Financial systems in developing and transitioning nations encounter hurdles that impede their effectiveness (Mishkin, 2019). However, Rousseau (2002) analysed historical data in four economies with financial revolutions—the Dutch Republic (1600-1794), England (1700-1850), the United States (1790- 1850), and Japan (1880-1913) and found that financial developments significantly promoted trade, commerce, and industrialisation. An empirical study of 27 economies, including the G-7, East Asia, Latin America, and Europe, revealed that per capita real income is a crucial determinant of financial development (Law & Habibullah, 2009). Therefore, financial development serves as a prerequisite for economic development. Consequently, understanding the key factors that contribute to financial development in developing nations like Nepal is of paramount importance.

Nepal is a multifaceted and diverse country characterised by various aspects. The presence of political turmoil has significantly impeded the pace of economic development in Nepal. As a nation, its foundation is deeply rooted in the sacrifices and efforts of countless ancestors. The aftermath of the people's movement of 2006 led to the establishment of the federal republic system, overthrowing the monarchy in Nepal, marking a pivotal moment in the country's state reconstruction. Ghimire (2019) states that a small group of elites, mostly adhering to Hinduism, led Nepal under a unitary system for an extended period. Conflicts arising from caste-based discrimination triggered the transition to a federal state. The movement aimed to eliminate social disparities based on region, religion, gender, caste, and poverty and instead to promote inclusive representation and national development. This led to the establishment of a federal system that addresses these concerns.

Economic growth leads to financial deepening and development. However, financial development does not occur in isolation; it is the outcome of well-developed infrastructure funded by the public sector. Schumpeter (1933) and Goldsmith (1969) also advocated the well-structured financial system for economic development. McKinnon (1973) posited that enacting appropriate financial sector reforms can accelerate the advancement of financial development, ultimately fostering economic growth. The financial development of a nation plays a vital role in overall economic growth and prosperity (Beck et al., 2000). The allocation and utilisation of public funds, coupled with the quality and availability of infrastructure, have significant implications for the financial development of Nepal (Pradhan, et al., 2015; Chindengwike, 2022; Gautam, 2014; Chettri, 2022).

Past studies have highlighted the positive link between economic growth and public expenditure (Barro, 1990; Dangal & Gajurel, 2021). However, the impact of public expenditure and infrastructure on financial development remains relatively underexplored in the Nepalese context. It is essential to examine these factors comprehensively to provide policymakers with insights for informed decision-making and effective resource allocation. In the context of Nepal, a landlocked South Asian country with a diverse provincial structure, understanding the nexus between economic growth, public expenditure, infrastructure, and financial development is of paramount importance.

Figure 1 shows that banks and financial institutions have penetrated and proliferated at the provincial level. This has been a growing trend in recent years, possibly due to the implementation of federalism in Nepal. On the other hand, provincial growth has followed a quite similar trend. In 2020, the growth was deficient and negative for all provinces except Karnali and Sudurpaschchim, primarily because of their vulnerability to COVID-19. However, there has been a recent upward trend, which is reasonably satisfactory. The trend of financial access and growth is associated with growing interest in academic research. Financial development is essential to sustaining federalism in Nepal. Thus, the paper may contribute and provide some insights into the financial development of Nepal at the provincial level.

**Figure 1. Branches of bank and financial institutions (right side) and economic growth (left side) of provinces of Nepal.**

Data are adapted from (the Ministry of Finance [MOF], 2023)

This paper aims to investigate the intricate dynamics between economic growth, public expenditure, and infrastructure and their influence on the financial development of the provinces of Nepal. The majority of the reviewed literature focuses on examining the impact of financial development on economic growth and other macroeconomic issues. In contrast, this study takes a reverse approach by exploring the effects of growth, public expenditure, and infrastructure on financial development at the provincial level of Nepal. This paper presents a novel perspective within the context of Nepal, given the relatively recent adoption of federalism in the country and the current era of burgeoning financial inclusion. Thus, this research endeavours to bridge the existing knowledge gap and offer insights that can inform policy formulation, resource allocation strategies, and infrastructure development plans aimed at fostering the financial development of the provinces of Nepal. The rest of the paper includes the literature review, data and methods, results and discussion, conclusion and implication, and limitations.

## Literature Review

Public expenditure is crucial to accelerate economic growth (Dangal & Gajurel, 2021), and low economic growth results from low public spending on infrastructure (Shrestha, 2009). Financial development enhances economic growth (Patrick, 1966); however, the relationship between economic growth and financial development is causal in both directions (Calderón & Liu, 2003). Hence, public expenditure is pivotal in channelling resources towards infrastructure development and stimulating economic growth. By employing such mechanisms, the enhancement of financial development is facilitated.

### *Economic Growth and Financial Development Nexus*

The nexus between economic growth and financial development is a topic that has been extensively studied and consistently shown to be positive. Accessibility of financial institutions accelerates economic growth because it helps to accumulate capital, mobilise resources efficiently, and improve innovation (Schumpeter, 1933; McKinnon, 1973; Shaw, 1973). However, the reverse side of the nexus has not been adequately researched.

Levine (1997) discussed that economic growth affects financial development through several channels. Firstly, it increases demand for financial services, as growing businesses require access to capital for investment and expansion. This scenario stimulates the development of financial institutions and

markets to cater to these needs. Secondly, economic growth enhances the profitability and stability of financial institutions, as rising incomes and reduced uncertainty improve borrowers' repayment capacity and lower credit risks.

Rachdi and Mbarek (2011) conducted a study using panel data cointegration and GMM system approaches from 1990 to 2006 to examine the relations between financial development and real GDP per capita in MENA and OECD in ten countries. Their findings strongly indicate a positive connection between financial development and real GDP per capita. Furthermore, applying the error correction model approach revealed that for the OECD countries, causality is bidirectional, implying that economic growth stimulates financial development. In contrast, for the MENA countries, causality is unidirectional, suggesting that economic growth influences financial development.

In a different research conducted by Song et al. (2021), they utilised panel cointegration and panel error correction models to analyse the enduring connection between corruption, economic growth, and financial development. This investigation encompassed 142 nations and spanned from 2002 to 2016. The findings of this research reveal that economic growth positively impacts financial development, as indicated by the estimations obtained through panel FMOLS. Additionally, the results from the VECM analysis demonstrate the existence of causal relationships running from economic growth to financial development.

Some empirical findings suggested that there is bidirectional causality and mutuality between economic growth and financial development through the positive spillover and channelised in various aspects (Pradhan et al., 2015; Akinlo & Egbeunde, 2010; Abu-Bader & Abu-Qarn, 2008; Calderón & Liu, 2003; Hassan et al., 2011). Economic growth is the annual growth of the actual national output (Todaro & Smith, 2020) that fosters the financial deepening of the economy. As an economy expands, it generates higher incomes and increased savings, contributing to the accumulation of financial resources within the system. These resources can then be channelled into various financial intermediaries such as banks, insurance companies, and capital markets, fostering the growth and development of the financial sector.

### ***Infrastructure and Financial Development Nexus***

Infrastructure, encompassing road networks, electricity access, and education systems, is crucial in shaping financial development. Efficient transportation networks and reliable electricity supply facilitate business operations, while quality education enhances human capital, fostering innovation and entrepreneurial activities, thereby contributing significantly to overall financial development (World Bank, 2019; Calderón & Servén, 2004).

Pradhan et al. (2015) revealed a cointegration between infrastructure and financial development evidence from Asian countries. Nkemgha et al. (2023) found that infrastructure development in Africa directly enhances industrialisation. However, when considering the indirect effects through financial development and human capital, the overall impact remains positive but varies based on different infrastructure specifications and transmission channels. For example, integrating electricity and transportation systems with financial progress and human resources led to unfavourable outcomes.

Some literature found a causal link between human capital and financial development. Researchers have examined the interplay between human capital (suppose educational infrastructure), which represents the knowledge, skills, and abilities of individuals, and financial development, which refers to the development and efficiency of financial systems (Beck et al., 2000; Acemoglu & Zilibotti, 2001). Moreover, recent empirical studies found a causal link between infrastructure (road, electricity, and education) and financial development (Mohanty & Bhanumurthy, 2019; Sbia et al., 2017). Ray (2015) revealed that infrastructure finance helps to enhance financial development. However, the human capital and financial development nexus has been widely studied in the context of economic growth and development.

## ***Public Expenditure and Financial Development Nexus***

Public expenditure on financial development is crucial in enhancing economic growth, promoting financial stability, and reducing poverty. Public expenditure on education and human capital development has been identified as a key driver of financial development. Higher levels of public spending on education improve financial literacy, increase financial innovation, and enhance the overall efficiency of the financial system (Beck et al., 2009). Fonseca and González (2010) have shown that increased public investment in infrastructure, including transportation and communication networks, leads to greater financial intermediation and improved access to credit, thereby fostering financial development.

In addition to its impact on financial development, public expenditure is crucial in ensuring financial stability. Effective allocation of public funds towards establishing and enforcing regulatory frameworks is essential. Barth, Caprio, and Levine (2013) highlighted that effective public expenditure on financial regulation enhances the soundness and stability of the banking sector, reducing the likelihood of financial crises. Moreover, increased public spending on financial safety nets, such as deposit insurance schemes and lender-of-last-resort facilities, contributes to greater financial stability and helps mitigate the negative impacts of financial shocks (Crockett, 1997; Houben et al., 2004; NRB, 2016).

The examination of 27 post-communist economies between 1995 and 2017, utilising dynamic panel estimators, revealed that these economies must prevent government spending from crowding out the financial sector. This study, conducted by Haini and Wei Loon (2022), emphasised the significance of promoting financial efficiency and accessibility in post-communist economies, alongside avoiding any negative impacts on the financial sector caused by excessive government spending.

## **Data and Methods**

### ***Variables and Data***

The number of branches of banks and financial institutions (BFIs) is taken as the proxy of financial development to achieve the anticipated objective of the article. It is an outcome variable. Due to the limitation of data, the limited explanatory variables are considered in this study. Public expenditure encompasses current and capital (crore), local road network (km), number of schools, and electricity production (MW) are collected as explanatory variables. Indicators of variables of interest are as follows:

- **Indicators of financial development (FD):** Branches of banks and financial institutions show financial accessibility and outreach. Due to the lack of data for other indicators of FD, branches of BFIs (Gagliardi, 2007) are taken as the proxy of financial development.
- **Indicators of public expenditure (G):** Public expenditure is divided chiefly into capital and recurrent expenditure. So, recurrent expenditure and current expenditure (Dangal & Gajurel, 2021) in crore are proxied for public expenditure.
- **Indicators of infrastructure (Infra):** Infrastructure refers to physical and social facilities. In this study, the local road network in kilometres (Road), number of schools (School), and electricity production in megawatts (Electricity) are proxied for the infrastructure.
- **Economic growth (GDPg):** In this paper, annual growth in real GDP (Gajurel, 2022) is proxied for economic growth.

All the data are obtained from the Economic Survey (MOF, 2023) of Nepal published by the Ministry of Finance, Nepal. The data covers only a few periods from 2019 to 2023 across the seven provinces of Nepal. All the variables are in yearly cumulative form. All the positive series are transformed into logarithmic form.

## ***Model specification***

This study is quantitative in nature. The seven provinces of Nepal have different economic possibilities and prospects. Every province has different socio-economic features. Thus, this study has assumed that the intercept may differ due to differences in the disparity of socio-economic characteristics of provinces. A fixed effect model (FEM) has been applied to handle this. The Hausman test is performed to confirm this. The basic model specification of the study is

$$FD = f(G, \text{Infra}, \text{GDPg})$$

The pane data analysis model is employed to examine relations between public expenditure (G), infrastructure (Infra), and economic growth (GDPg) on financial development. The following general panel data model is estimated:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it}$$

Here,  $Y_{it}$  is an endogenous variable with time and entities, and  $X_{it}$  is an exogenous variable with time and entities. The estimated model of this study is the fixed-effect model (FEM), which encompasses the time-invariant effects and individual-invariant effects. The panel FEM (Chatterjee, 2020) can be estimated as:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \alpha_i + \delta_t + \varepsilon_{it}$$

Where  $Y_{it}$  = endogenous variable (i.e., financial development) across the  $i^{\text{th}}$  provinces at the period of time

$\beta_0$  = intercept

$X_{it}$  = matrix of exogenous variables

(i.e., government expenditure, growth, and infrastructure-related variables)

$\beta_1$  = vector of parameters of exogenous variables

$\alpha_i$  = provinces-specific time-invariant effect

$\delta_t$  = time-specific provinces invariant effect

$\varepsilon_{it}$  = stochastic disturbance

Fixed effects regression is a technique utilised to account for unobserved factors in panel data where these factors differ among individual entities but remain constant over time (Stock & Watson, 2015). In the fixed-effects (FE) approach, the  $\alpha_i$  values are incidentally considered free parameters to the analysis, while the primary focus lies on the  $\beta$  values (Pesaran, 2015). Eventually, in order to assess heteroscedasticity, autocorrelation, and cross-sectional dependency (CD), Panel-Corrected Standard Errors (PCSE) regression is employed.

## **Results and Discussion**

The results and discussion section is divided into four headings per the study's purpose. The different nexus—G to FD, Infra to FD, GDPg to FD, and combined all to FD are considered under the study. In this study, every nexus has considered the others are interplaying the relationship.

### ***Growth-Financial Development Nexus***

Economic growth is the quantitative measurement of the productivity of different sectors of the economy. Table 1 reports the growth and financial development via different channels. As the economic growth of the provinces of Nepal fluctuates, growth is negatively significant with financial development. The negative impact of growth in financial development can be attributed to increased economic inequality and financial instability. However, to some extent, road infrastructure can reduce this adverse effect. However, public financing is not contributing to growth in financial development.

**Table 1. Growth and Financial Development Nexus (FEM)**

Variables	Model 1	Model 2	Model 3
	Fixed Effects	Fixed Effects	Fixed Effects
growth	-0.0583*** (0.0202)	-0.0498*** (0.0159)	-0.0587*** (0.0207)
Inroad		3.723*** (0.924)	
Inschool		1.042 (1.790)	
electricity		0.000499 (0.000368)	
Incurrent			0.178 (0.565)
Incapital			0.0215 (0.397)
Constant	7.215*** (0.0922)	-35.20** (16.76)	5.871*** (1.572)
F-Statistic	8.32***	10.03***	3.03**
R-squared	0.236	0.626	0.266
Hausman Test ( $\chi^2$ )	-	11.79***	13.39***

*Note. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$*

These results are quite peculiar, in contrast with Song, et al. (2020), but growth with infrastructure should promote financial deepening in the provinces of Nepal. Security, financial distress, lack of infrastructure, income disparity, ineffective governance, and low performance of public finance at local levels may cause the adverse effects of growth on financial development. The curtailment of construction activities, reduced registration of new enterprises, decelerated credit expansion to the private sector, and diminished imports of intermediate and capital goods all point towards a contraction in private investment (World Bank 2023), leading to a diminished pace of financial development. Thus, the channel of growth as a result of infrastructure development is indispensable to financial development at the provincial level of Nepal.

### ***Public Expenditure and Financial Development Nexus***

Public expenditures are categorised as either general or development finance. The optimal allocation of the public budget plays a significant role in financial development. Table 1 shows that growth focused on infrastructure promotes financial development. The channel of public expenditure and financial development is reported in Table 2.

**Table 2. Public Expenditure and Financial Development Nexus (FEM)**

Variables	Model 1	Model 2	Model 3
	Fixed Effects	Fixed Effects	Fixed Effects
Incurrent	0.346 (0.633)		0.730 (0.435)
Incapital	-0.111 (0.444)		-0.155 (0.300)
Inroad			4.082*** (0.941)
Inschool			5.467** (1.958)
electricity			0.000741* (0.000394)
Inexp		0.151 (0.184)	
Constant	5.459*** (1.764)	5.878*** (1.393)	-80.05*** (18.54)
F-Statistic	0.41	0.67	7.76***
R-squared	0.031	0.024	0.628
Hausman Test ( $\chi^2$ )	1.49	-	19.71***

Note. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The results indicate that current and capital expenditures do not significantly influence financial development, either individually or combined. However, when public expenditure is directed toward infrastructure development, it can foster financial development at the provincial level in Nepal. According to Table 2, a strong positive relationship exists between investments in roads, schools, and, to some extent, electricity and financial development when considering public expenditure as a control variable. The insignificance of the relationship between public expenditure and financial development may be attributed to inefficient allocation, a mismatch between spending priorities and financial development goals, the influence of economic and political factors, and the absence of supporting policies. This may be due to the early stage of federal practices in Nepal according to Shahbaz et al. (2017), thus, financial development is hindered by the institutional quality and government size, but facilitated by urbanisation, industrialisation, and growth in the service sector. Consequently, institutional restrictions aimed at preventing predatory governance seems to offer an additional level of protection in ensuring the safety of financial transactions (Herger et al. 2008). From the results of Table 2, it can be concluded that financial development can be accelerated with disciplined developmental financing.

### ***Infrastructure and Financial Development Nexus***

Infrastructure facilitates financial development by providing essential channels and mechanisms that enable economic activities, such as efficient transportation networks, reliable utilities, and communication systems, leading to increased investment, productivity, and overall economic growth. Table 1 and Table 2 visualise that infrastructure development is crucial to financial development at the provincial level of Nepal.



**Table 3. Infrastructure and Financial Development Nexus (FEM)**

Variables	Model 1		Model 2		Model 3	
	Fixed Effects		Fixed Effects		Fixed Effects	
Incurrent			0.730			
			(0.435)			
Incapital			-0.155			
			(0.300)			
Inroad	4.023***	3.723***	4.082***	3.963***		
	(1.070)	(0.924)	(0.941)	(0.951)		
Inschool	2.698	1.042	5.467**	4.973**		
	(1.991)	(1.790)	(1.958)	(1.951)		
electricity	0.000466	0.000499	0.000741*	0.000789*		
	(0.000428)	(0.000368)	(0.000394)	(0.000398)		
growth		-0.0498***				
		(0.0159)				
Inexp				0.391**		
				(0.141)		
Constant	-52.11***	-35.20**	-80.05***	-73.92***		
	(18.47)	(16.76)	(18.54)	(18.21)		
F-statistic	7.45***	10.03***	7.76***	8.99***		
Observations	35	35	35	35		
R-squared	0.472	0.626	0.628	0.600		
Hausman Test ( $\chi^2$ )	11.71***	11.79***	19.71***	22.11***		

Note. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 3 reveals that road infrastructure can positively and significantly influence provincial financial development. The results also indicate that economic growth negatively influences financial development even if the road network is extended. However, when public expenditure is endorsed into the model, all indicators of infrastructure become statistically significant and promote financial development. Finally, the results reveal that all infrastructure indicators and total public expenditures significantly contribute to financial development. Thus, public expenditure, which finances the development of infrastructure, should promote financial development at the provincial level in Nepal.

### ***Growth, Public Expenditure, Infrastructure and Financial Development***

Financial development is interconnected with different channels including public spending, infrastructure development, and growth. It is the study of how these factors are related and how changes in one aspect can influence the others, ultimately impacting a country's overall financial development and economic well-being. Understanding this nexus is crucial for policymakers to design effective strategies that promote sustainable economic growth and development.

**Table 4. Determinants of Financial Development (FEM)**

Variables	Model 1	Model 2	Model 3	Model 4
	Fixed Effects	Robust Fixed Effects	Fixed Effects	Robust Fixed Effects
growth	-0.0437*** (0.0142)	-0.0437** (0.0123)	-0.0460*** (0.0138)	-0.0460*** (0.0107)
Incurrent	0.475 (0.381)	0.475 (0.388)		
Incapital	-0.0119 (0.260)	-0.0119 (0.281)		
Inroad	3.776*** (0.810)	3.776** (1.303)	3.693*** (0.803)	3.693** (1.242)
Inschool	3.620* (1.777)	3.620 (3.147)	3.230* (1.720)	3.230 (3.085)
electricity	0.000765** (0.000337)	0.000765* (0.000315)	0.000788** (0.000334)	0.000788** (0.000316)
Inexp			0.354*** (0.119)	0.354** (0.117)
Constant	-60.76*** (17.02)	-60.76* (29.76)	-56.25*** (16.18)	-56.25 (29.50)
F-statistic	10.45***		12.41***	
Observations	35		35	
R-squared	0.740	0.740	0.730	0.730
MWald Test	166.75***		111.44***	

Note. Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 4 reveals that road infrastructure, electricity, and school facilities positively influence financial development. Improved road infrastructure allows for better transportation and connectivity, facilitating economic activities and attracting investments, leading to increased financial development. Similarly, investments in school facilities enhance human capital and workforce productivity and promote financial literacy and habit of financial uses and outreach, further contributing to financial development. However, current and capital expenditures' impact on financial development appears insignificant in the models. Moreover, total provincial public expenditure with infrastructure development positively impacts financial development. The modified Wald test is significant; thus, the robust FEM is applied, which also confirms the same sort of relationship among FD and other variables of interest.

### ***Robustness of the FEM Estimation***

The Hausman test for all the models estimated in this study provides valuable insights into employing FEM. However, the Wooldridge test for autocorrelation shows a significant F-statistic of 11.307 ( $p = 0.0152$ ) and indicates autocorrelation in panels. Moreover, the cross-sectional dependency test, based on Pesaran (2004), also confirms the presence of cross-sectional dependency across the provinces of Nepal (Table 5).

**Table 5. Cross-sectional Dependency Test**

Variables	CD-test	P-value
lnbfe	10.22	0.000
growth	9.62	0.000
lncurrent	9.59	0.000
lncapital	9.76	0.000
lnroad	9.88	0.000
lnschool	5.03	0.000
electricity	8.78	0.000

This study covers five years with seven cross-sections ( $N > T$ ). Thus, as suggested by Hoechle (2007), the Panel-Corrected Standard Errors model (PCSE) is employed for the cross-validation and robustness of the FEM findings. This estimation also checks the panels' autocorrelation and cross-sectional dependency or heterogeneity. The PCSE results (Table 6) confirm the same conclusion as FEM, which is that economic growth has a negative and insufficient effect on provincial financial development. Similarly, the results reveal that road and electricity infrastructure are crucial for accelerating financial development, consistent with FEM estimations. Public financing does not significantly affect provincial financial development, as found in FEM. Thus, as confirmed by PCSE, the FEM estimates are robust and well-fitted.

**Table 6. Panel-Corrected Standard Errors Model Estimations for LnBFE**

Variables	Autocorrelation form: No	Autocorrelation form: AR(1)	Autocorrelation form: Panel – specific AR(1)
growth	-0.0616 (-1.540)	-0.0572*** (-2.581)	-0.0545*** (-3.195)
lncurrent	0.609 (1.284)	0.161 (0.489)	0.144 (0.541)
lncapital	-0.288 (-0.865)	0.0882 (0.404)	0.129 (0.710)
lnroad	1.127*** (3.237)	0.782*** (3.206)	0.613*** (2.647)
lnschool	-0.304 (-0.431)	0.292 (0.535)	0.299 (0.635)
electricity	-0.000220 (-0.631)	0.000138 (0.477)	0.000587** (2.230)
Constant	-2.341 (-1.305)	-4.044* (-1.896)	-3.022 (-1.546)
R-squared	0.751	0.920	0.986

Note. z-statistics in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Conclusion and Implication

Financial deepening determines the economic sustainability of a nation. Nepal is in the developing stage, and federal practice is in the infancy stage. For the early stage of provincial sustainability,

financial development must be indispensable. The several channels of financial development are discussed theoretically. This paper deals with these three channels of financial development—G to FD, Infra to FD, and GDPg to FD. The fixed effect model (FEM) has been applied with five years of recent data from 2019 to 2023 to estimate Nepal's provincial financial development. For the robustness of the FEM and to avoid heteroscedasticity, autocorrelation, and cross-sectional dependency (CD), the PCSE regression was also employed.

The findings reveal that growth-directed development alone does not lead to enhanced financial development. However, if public finance contributes to infrastructure development, the growth can significantly impact financial development. Nevertheless, the insights from the findings suggest that relying solely on channelised public finance to accelerate growth may be outdated in the context of current market-based financial development. Hence, it is not useful to financial development at the provincial level of Nepal. Similarly, the findings indicate that public expenditure does not significantly impact financial development. However, development financing can indeed promote financial development. Therefore, it is advisable to direct public expenditure towards improving road, electricity, and school infrastructure, as these investments can accelerate provincial financial development. The findings also highlight that the road network plays a crucial role in Nepal's financial development at the provincial level. Thus, the overall stylised facts suggest that the growth nexus has had an adverse influence. In contrast, infrastructure positively impacts the financial development of Nepal's provinces. Additionally, other than capital and current, joint public expenditure has positively contributed to promoting financial development in the provinces.

The research findings emphasise the need to prioritise infrastructure investments and efficient joint public expenditure to promote financial development in the provinces of Nepal. Public expenditure significantly impacts financial development at the provincial level of Nepal. However, it is important to note that the overburden of provincial recurrent expenditure, along with a lack of fiscal discipline and mechanisation of resources, hinders Nepal's financial development and provincial sustainability. Thus, policymakers should be more cautious and foster collaboration, address barriers to the growth nexus, and focus on long-term sustainable development finance, which can further enhance the effectiveness of these strategies.

## Limitations

Due to the limited availability of data, further studies will be necessary to analyse the complexity of financial development at the province level in Nepal. This study covers only a five-year observation period. The panel fixed effect model is exclusively applied to estimate the relationship. Given the early stage of federalism in Nepal, only one indicator of financial development is considered, which is quite limited. Different scholars may use several indicators to measure financial development. The determinants of financial development at the province level are currently restricted to growth, public expenditure, and infrastructure in a limited area. Therefore, further research is essential with different perspectives and a wide range of data.

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