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Financial Development and Foreign Direct Investment Impact on Economic Growth: Evidence from Nepal

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Abstract

The interplay among financial development, foreign direct investment (FDI), and economic growth has been a subject of keen interest among scholars, both from a theoretical standpoint and through empirical research. Focusing on Nepal, this study examines the distinctive connections among economic expansion, the influx of foreign capital, and the evolution of the financial sector. Given the lack of a definitive metric for financial development, this research adopts the financial development index, along with the financial institution index and financial market index, as alternative indicators. It also considers additional variables that could influence economic growth beyond financial development and FDI. Utilizing the Autoregressive Distributed Lag (ARDL) bounds testing method and the Error Correction Model (ECM), the analysis uncovers a robust positive link between financial development and FDI in enhancing Nepal's economic output. Furthermore, both the short-term and long-term analyses prove to be reliable, devoid of issues like heteroscedasticity, autocorrelation, and multicollinearity. Importantly, the findings indicate that in the face of short-term disruptions, the dynamics between these variables adjust back to a long-term equilibrium state.

Keywords: Autoregressive distributed lag, economic growth, error correction model, financial development, foreign direct investment

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Introduction

A well-structured and dynamic financial system is crucial for channeling resources to the most productive sectors, thereby optimizing the allocation of limited resources and potentially enhancing Gross Domestic Product (GDP) through elevated savings and investment rates. Such a system not only bolsters economic growth by intensifying competition and promoting innovation, thereby improving dynamic efficiency, but also by executing essential functions that minimize information and transaction costs, which are impediments to economic activities (Demirguc-Kunt, 2008). In the context of Nepal, the financial sector remains nascent, characterized by underdeveloped financial institutions and intermediaries, along with uneven access across different regions. This scenario underscores the opportunity for strengthening financial institutions to foster the nation's financial development, which could, in turn, positively impact economic growth.

Foreign Direct Investment (FDI) is recognized widely in both theoretical and empirical research as a vital catalyst for economic growth. This is particularly true for developing economies that often suffer from low savings rates and require substantial physical capital to drive economic expansion. FDI serves as a crucial mechanism for these countries, enabling them not only to accumulate physical capital but also to facilitate the transfer of human capital. FDI's role extends beyond the mere augmentation of physical capital stock within host nations; it is instrumental in transferring technology, enhancing the productivity of production factors, and bridging the technological gap between local firms and their international counterparts, thereby improving overall economic efficiency (Anwar & Nguyen, 2010; Borensztein et al., 1998). This comprehensive impact of FDI emphasizes its importance in creating an environment conducive to sustainable growth and development. In Nepal, the capital formation is relatively low, which could be significantly improved through FDI inflows. Such inflows could act as a catalyst, accelerating domestic growth by providing the essential capital required for foundational infrastructure development.

The relationship among financial development, FDI, and GDP growth has captivated the interest of numerous scholars, leading to extensive empirical and theoretical exploration of their interconnections (Ang, 2008). This discourse often centers around the debate on the supply-leading versus demand-following hypotheses, investigating whether financial development leads to economic growth, whether economic expansion stimulates the growth of the financial sector, or whether these phenomena mutually reinforce each other (Murinde, 2012). Furthermore, technological innovations are universally acknowledged as the primary drivers of economic growth. FDI and international trade are critical in enhancing a country's technological capabilities (Aghion et al., 1998). However, for FDI to effectively influence production levels in the host economy, a robust human capital base capable of absorbing technology is indispensable (Forte & Moura, 2013). This highlights the crucial need for developing countries to build such capabilities to fully exploit the potential benefits of FDI.

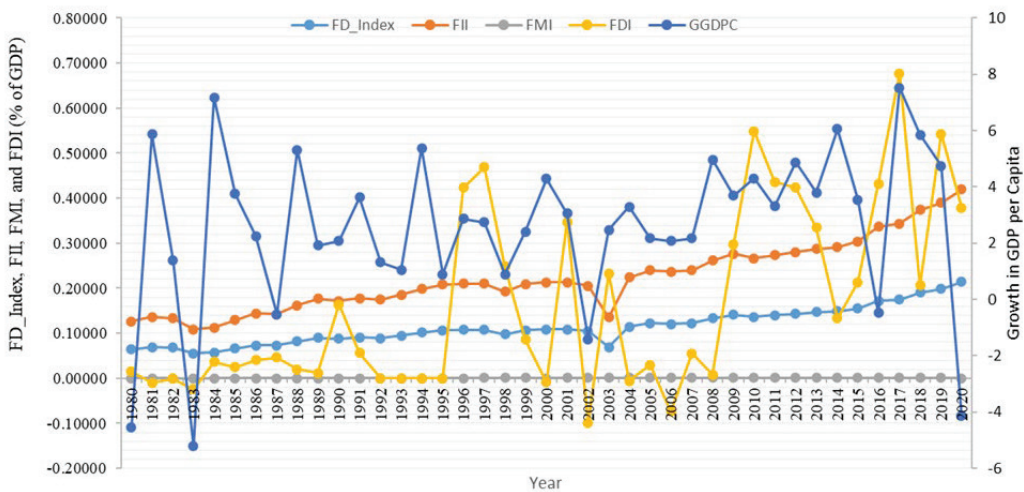
Since the mid-1980s, Nepal has undertaken financial reforms in several phases, guided by recommendations from the International Monetary Fund, World Bank, Asian Development Bank, and other development partners. These reforms aimed at improving the operational efficiency of financial intermediaries in Nepal and ensuring equitable access to financial ser-

vices across the country (Pandey et al, 2022). Despite these initiatives, financial development in Nepal has yet to achieve significant progress. Moreover, as a landlocked country bordered by two of the world's largest economies, India and China, Nepal has several advantageous attributes. These include access to affordable labor, a wealth of natural resources, and proximity to significant markets. Ideally, these factors should have attracted more Foreign Direct Investment (FDI), thereby stimulating economic growth. To fully leverage these attributes, Nepal must focus on strengthening its financial institutions and regulatory frameworks to create a more attractive environment for FDI, which in turn could catalyze broader economic development.

Figure 1 demonstrates a consistent upward trajectory in Nepal's financial development index over time, with the notable exception of a dip in 2003. This positive trend is largely attributed to the expansion of the financial institutions index, underscoring the growing presence and influence of financial institutions within the economy. However, the analysis also highlights a significant opportunity for growth in Nepal's financial market infrastructure. Despite the progress, the financial market index remains near zero, suggesting that while financial institutions have expanded, the broader financial market ecosystem, including aspects like stock markets, bonds, and other financial instruments, has not developed at a comparable pace.

Additionally, the data reveals variability in Foreign Direct Investment (FDI) flows and a notable increase in Gross Domestic Product per Capita (GDPPC). These fluctuations in FDI suggest that investment levels have been inconsistent, possibly reflecting changing investor confidence, varying economic policies, and external economic conditions that influence investment decisions. Meanwhile, the increase in GDP per capita indicates an improvement in economic performance and living standards over time, potentially tied to the incremental advancements in the financial sector among other factors.

Figure 1
Trend of Variables of Interest



The scholarly landscape suggests that the dynamics and impacts of the relationship between financial development, Foreign Direct Investment (FDI) inflows, and economic growth vary significantly across different economies, largely due to their distinct characteristics. This notion emphasizes the need for a tailored examination of Nepal's specific context to ascertain the contributions of financial development and FDI inflows to its economic enhancement. The role of financial development and FDI in bolstering Nepal's economy has not been thoroughly explored in a systematic manner. Furthermore, employing varied proxies for financial development in conjunction with FDI inflows could illuminate which aspects of financial development are most pivotal in driving economic growth in Nepal.

Such a nuanced approach acknowledges the intricate interplay between financial development and FDI in shaping economic outcomes. By dissecting the components of financial development and FDI inflows, the critical levers of economic development specific to Nepal can be pinpointed. This level of analysis is essential for crafting targeted policies and interventions that capitalize on the unique opportunities and challenges within the Nepalese economy. Identifying the precise mechanisms through which financial development and FDI influence economic growth will enable policymakers and stakeholders to foster a more conducive environment for sustainable economic development in Nepal, leveraging its unique position and potentials.

Literature Review

Financial Development and Economics Growth

In any economy, the existence of market friction give rise to the financial system with the aim to ameliorate the friction. Financial development refers to the ability of financial system to compare investment opportunities, monitor performance and exert corporate governance, ease diversification, mobilize the savings, and facilitate exchange (Levine, 1997). Effective financial intermediation is a crucial driver of economic growth, as it reduces the cost, risk, and time associated with information. When entrepreneurs create new techniques or technologies that are more efficient than previous ones, it leads to progress. Gurley and Shaw (1955) argued that an effective financial system is a prerequisite for the existence of a real sector.

Financial development stimulates the economy by enabling a lucrative return on capital investment, while economic growth creates the conditions for high-value finance, allowing for a high return on investment (Greenwood & Jovanovic, 1990). Ultimately, the inextricable link between an efficient financial system and the economy leads to increased growth. Levine found strong positive correlation among financial development and long-term performance of the economy, which was supported by both macro and micro-level data analysis (Levine, 1997). Khan and Senhadji (2006) asserted that the financial depth is the most significant determinant of difference in economic performance across the countries. In addition, the research found strong statistically significant positive impact of financial depth on economic growth which is much weaker in the panel data analysis.

Adelakun (2010) demonstrated that financial development significantly enhances Nigeria's economic performance, utilizing time series data for analysis. Nevertheless, the application of the Granger causality test revealed a two-way causality between financial development and economic growth. Estrada et al. (2010) using panel data analysis of 125 countries, found significant positive role of developed financial system on the economic performance of developing countries in Asia and the role has been reduced after the Asian financial crisis. Timsina (2014) analysed time series data from Nepal using the Johansen co-integration method and error correction model, concluding that bank credit to the private sector positively impacts economic growth in the long term. Nonetheless, the research identified a reciprocal effect on private sector credit due to economic growth in the short term. Rioja and Valev (2014) found that banks have significant positive impact on the capital accumulation however, there is no contribution of stock market in capital accumulation or productivity growth in low-income countries. Gautam (2015) through an analysis of time series data from Nepal, discovered that financial development contributes to economic growth in the short term, whereas in the long run, economic performance supports and sustains financial development. Mengesha and Berde (2023) found that the effective and efficient financial institutions with stable fiscal policies enhances economic growth in Ethiopia. In addition, Rahman et al. (2020) found that financial development in Pakistan has higher impact in the economic growth during the high-growth period.

Beck et al. (2014) identified a threshold effect in the relationship between credit expansion and economic growth, finding that while credit growth initially boosts economic development, its positive impact lessens beyond a certain point. This reduction is attributed to the scale of financial cycles and the growing significance of non-lending activities in banks' operational strategies. Arcand et al. (2015) applied a variety of econometric methods and conducted thorough robustness checks to explore the existence of a financial development level beyond which its beneficial impact on growth disappears. Their findings affirmed this "vanishing effect" of financial sector development on economic expansion. Although most research points to a beneficial link between financial development and economic growth, some studies, particularly those focusing on underdeveloped countries, have reported a negative or insignificant effect. In addition, some studies have also suggested about the bi-directional relationship between financial development and economic growth (Lawal et al., 2016). Buffie (1984) suggested that with the expansion of the formal financial sector, the required reserve ratio increases, leading to liquidity shortages in the informal market. This scenario results in a credit crunch, thereby hampering actual economic growth.

The discourse surrounding the connection between financial development and economic growth is intricate and multi-layered, highlighting the complexity of their interplay. Recent studies offer a nuanced view, indicating that financial development's effect on growth isn't consistently positive and may show diminishing returns after surpassing specific limits. This evolving understanding calls for a balanced, multi-dimensional analysis that transcends simplistic narratives. By adopting a holistic approach that embraces the diversity of findings, policymakers can craft more effective financial regulations and policies that harness the potential

of the financial sector for comprehensive economic advancement, thereby aligning with the nuanced realities of modern economies.

FDI and Economic Growth

Theoretically, the influx of foreign investment benefits both investors and recipients. Investors can reduce production costs, expand their market share, and increase their return on investment, while host countries can gain access to improved technology and know-how, transfer human capital, generate employment, enhance the skills of existing human resources, and other benefits with positive implications for economic growth (Dunning & Lundan, 2008). FDI has been proposed as a strategy for accelerating economic growth, supported by a wealth of theoretical and empirical research. One of the key benefits of FDI is its ability to act as a mechanism of accumulation for developing countries that struggle to accumulate physical capital due to low saving rates. In addition to boosting physical capital, FDI can also transfer technology, enhance the efficiency of factors of production, and narrow the technological gap between local and international firms (Anwar & Nguyen, 2010; Borensztein et al., 1998). As economic growth is driven by technology-driven innovation, FDI and international trade can play a crucial role in enhancing the level of technology used in an economy (Aghion et al., 1998). Increasing globalization and liberalization of the world economy has made the world a smaller place with significant increase in cross-country trade. Countries specialize in sectors where they have a comparative advantage and investment in capital-intensive technologies is necessary to drive economic growth. However, as resources are limited and domestic markets are open to foreign investors, foreign investment is necessary to fill the investment gap. FDI not only makes up for investment deficits in host countries but also enhances development through productivity intensification via new investments, improved and efficient technologies, and the capability enhancement of human resources (Iamsiraroj, 2016; Pegkas, 2015; Tintin, 2013).

FDI enhances growth in host countries mainly through two channels: increasing capital investment and technological spillovers (Mahembe & Odhiambo, 2016; Temiz & Gökmen, 2014). Farla et al. (2016) defined FDI as the assembly and transfer of tangible and intangible capital across borders, which increases the productivity of host countries and results in economic growth. FDI is not only important for its positive economic impact on the host country, but also an important determinant of global economic integration, establishing direct, stable, and long-lasting relationships between countries. FDI is therefore a crucial agent for globalization (Giammanco & Gitto, 2019). Farla et al. (2016) explain that FDI causes "crowding in," increasing investments from domestic private sectors, refuting the conclusions of Morrissey and Udomkerdmongkol (2012), which suggest that FDI causes "crowding out," decreasing domestic private investment.

While FDI has been praised for its positive impact on economic growth, there are also concerns about its potential negative effects. When FDI is concentrated in only a few sectors of the economy, it can lead to an unequal distribution of income and wealth, particularly if a critical threshold of FDI is exceeded. Moreover, the effect of FDI on income distribution var-

ies depending on the host country's absorption capability, as noted by Wu and Hsu (2012)¹²⁹. FDI can have a detrimental impact on income equality in countries with limited absorption capacity, while having a negligible impact in nations with higher absorption ability. However, Adams and Klobodu (2017) found that FDI has a negative impact on income equality both in the short and long run. Increased income inequality, as highlighted by Babu et al. (2016), can undermine economic growth. However, for FDI to be effective in determining levels of production in the recipient economy, a strong human capital base with a high level of technology absorption capacity is required (Forte & Moura, 2013). For instance, Curwin and Mahutga (2014) found that FDI penetration reduces economic progress in socialist countries in the short and long run. On the other hand, Carkovic and Levine (2005) suggest that FDI has no meaningful and independent influence on growth, implying that FDI does not always stimulate economic growth. Hermes and Lensink (2003) also reveal that FDI has little or no influence on economic growth. Additionally, some literature has shown either no effect or negative effects of FDI on economic growth (Ang, 2009; Mencinger, 2003; Temiz & Gökmen, 2014).

Therefore, while FDI has potential benefits, careful consideration is needed to ensure that it is diversified across sectors and does not contribute to unequal distribution of income and wealth. The findings from these studies indicate that the relationship among economic performance and foreign direct investment is not straightforward and may depend on various country-specific factors. While some studies show a positive relationship between the two, others reveal that FDI has little or no influence on economic growth. The impact of FDI on economic growth is complex and varies depending on various factors such as the research period and the productive systems of the nations.

Financial Development, FDI, and Economic Growth

The complex three-way relationship FDI, financial development, and economic growth has received considerable attention, focusing primarily on how FDI contributes to economic expansion, a process significantly influenced by the economy's level of financial development. Hermes and Lensink (2003) applied a model of technological change to illustrate the theoretical linkage between FDI and economic growth via financial development. Durham (2004) argued that an economy with a more developed financial system is better equipped to assimilate foreign capital inflows, including both FDI and portfolio investments. Similarly, Omran and Bolbol (2003) investigated the dynamics between financial development, FDI, and economic growth, affirming the prevailing view that nations with more capable financial systems, demonstrating higher absorptive capacities, derive greater benefits from FDI. Their research, which utilized data from Arab countries, also corroborated the hypothesis that capital inflows positively influence growth only beyond a certain level of financial development. The analysis was conducted using Ordinary Least Squares (OLS) and Granger causality tests to examine the proposed model.

Alfaro et al. (2004) demonstrated through empirical research that economies with advanced financial systems are better equipped to leverage the technological advancements and oth-

er advantages brought by foreign capital inflows, thus fostering growth in the host country. Choong and Lim (2009) utilized an endogenous growth model within a co-integration framework to study the interaction between FDI and financial development, highlighting FDI's crucial role in spurring domestic economic growth. Hermes and Lensink (2003) noted a positive influence of FDI on economic development through technological diffusion from foreign capital, especially when financial development reaches a certain level.

Conversely, Saibu et al. (2011) observed a negative association between financial development, FDI inflows, and domestic economic growth, employing the ARDL technique on a standard endogenous growth model and noting that the choice of financial development proxy significantly influences FDI's effect on growth. Shahbaz et al. (2011) investigated the dynamics of foreign capital inflows, financial development, and economic growth in Portugal from 1975 to 2008, using the ARDL bound testing approach and ECM, finding that public capital investment positively affected the economy more than financial deepening or capital inflows did, while inflation adversely affected growth.

Shahbaz and Rahman (2012) analysed the impact of financial development, FDI, and imports on economic growth in Pakistan from 1990 to 2008, utilizing the ARDL bound testing approach and VECM, discovering a significant positive long-term effect of financial system development, FDI, and imports on economic development. Choong (2012) examined the relationship between financial development, FDI, and economic growth across 95 countries with varying levels of development from 1983 to 2006 using panel GMM analysis, finding that financial development plays a crucial role in enabling FDI to boost growth.

Jahfer and Inoue (2014) explored the interconnection between financial development, FDI, and economic growth in Sri Lanka using data from 1996 to 2011, employing the Johansen co-integration technique and vector error correction model to uncover a bi-directional causality and long-term relationship between financial development and growth, concluding that financial development had a more substantial impact on the Sri Lankan economy than FDI and highlighted a one-way causal effect from economic growth and financial development to FDI. Suliman and Elian (2014) analysed the causal links among FDI, economic growth, and financial development using a structural co-integration model and vector error correction model, revealing a mutual reinforcement among FDI, financial development, and economic growth in both short and long terms, emphasizing the critical role of a well-developed financial system in absorbing FDI and positively influencing the host country's economy.

Yeboua (2019) explored the influence of financial development on augmenting FDI's growth effects across 26 African nations using a panel smooth transition regression model (PSTR), analysing data spanning from 1990 to 2013. The research indicated the necessity of a basic level of financial development to harness the growth-promoting benefits of FDI, urging policymakers to enhance the efficiency of financial systems to capitalize on FDI's economic advantages. Pradhan et al. (2019) delved into the diverse causal interactions among financial development, FDI, and economic growth within G-20 nations from 1970 to 2016, employing a vector error correction model. Their findings revealed a variable short-term relationship

among these elements but underscored the critical role of FDI and financial development in driving long-term economic growth, advocating for the development of robust and efficient financial systems alongside facilitating foreign capital influx to spur economic expansion.

Osei and Kim (2020) assessed how financial development incrementally affects FDI's positive influence on growth, utilizing linear system GMM and dynamic panel threshold models across 62 middle and high-income countries from 1987 to 2016. Their findings highlighted a plateau in the growth effects of increasing financial development beyond a specific threshold, reinforcing the "vanishing effect" theory that suggests the impact of capital inflow on growth wanes at certain levels of financial development within the host country.

This study aims to examine the dynamic interplay between financial development, foreign direct investment (FDI), and economic growth in Nepal, a topic scarcely addressed in existing research despite the nation's distinct economic traits. Acknowledging discrepancies in outcomes due to the variety of financial development proxies used, this investigation will apply a thorough methodology and up-to-date data to guarantee accuracy. It will also revisit Nepal's financial sector reforms to better grasp their effects. Through offering policy suggestions, this study intends to provide practical guidance for boosting economic growth via enhanced financial policies, thereby equipping Nepali policymakers with empirical data to aid in well-informed decision-making.

Research Methods

Variables and Data

This study uses annual time series data from the World Bank and the International Monetary Fund (IMF), spanning 41 years from 1980 to 2020 (Svirydzenka, 2016; World Bank, 2022). The period was selected due to the unavailability of comprehensive data for the considered variables before 1980 and occurrence of COVID-19 pandemic in 2019. In this research, GDP per capita growth (GGDPC) serves as the dependent variable, reflecting the economy's overall performance. Independent variables include the financial development index (FD), financial institution index (FII), financial market index (FMI), and foreign direct investment (FDI), chosen for their roles in influencing economic growth. Additionally, government expenditure as % of GDP (GEGDP), inflation (INF), and trade openness (TO) are incorporated as control variables to account for other external factors affecting economic growth. This model aims to capture the intricate relationships between financial development, FDI, and economic growth, adjusting for the impact of fiscal policy, inflationary trends, and external trade dynamics.

Methodology

The growth equation builds upon the foundational work of Mankiw, Romer, and Weil, rooted in the neoclassical growth model (Mankiw et al., 1992). This model originally linked the growth rate of real GDP with variables like investment as a percentage of GDP and population growth rate per capita. To tailor this framework to the study's focus, additional variables are

integrated that capture the nuances of economic dynamics in Nepal: a financial development indicator, the initial level of real GDP per capita, and foreign direct investment (FDI). This augmented model allows for a nuanced exploration of the interplay between financial development, FDI, and economic growth within Nepal's unique economic landscape. The model's structure is methodically crafted to empirically analyse these intricate relationships, offering a comprehensive tool for understanding the factors driving economic growth in Nepal.

$$EG = f(FD, FDI) \dots \dots \dots (i)$$

where, EG= Economic Growth proxied by growth in GDP per Capita, FD = Financial development proxied by Financial Development Index, Financial Institution Index, and Financial Market Index, and FDI = Foreign Direct Investment

The linear transformation of equation (1) is expressed as equation (2)

$$GGDPC_t = \alpha + \beta_1 FD_t + \beta_2 FDI_t + \beta_3 CV_t + U_t \dots \dots \dots (2)$$

where, GGDPC = Growth in GDP per Capita, FD = Financial Development Proxies (FD_Index, FII, and FMI), CV = GEGDP, INF, and TO, α = Intercept, β_1 , β_2 , and β_3 are respective coefficients, U_t = Error term.

Analysing time series data necessitates checking for stationarity due to the risk of non-stationary data leading to unreliable modelling outcomes. To tackle this, the study assessed the dataset for unit roots using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, aimed at ensuring variables are not only stationary after differencing twice or more—a scenario that could invalidate regression analyses noted by Pesaran et al. (2001). The analysis revealed a combination of variables that are stationary at their original levels and after first differencing. Consequently, the study utilized the F-bound test within the Autoregressive Distributed Lag (ARDL) framework for exploring long-term relationships between the variables. For the investigation of short-term dynamics, the Error Correction Model (ECM) was implemented.

$$\begin{aligned} \Delta GGDPC_t = & \alpha + \beta_1 GGDPC_{t-1} + \beta_2 FD_{t-1} + \beta_3 FDI_{t-1} + \beta_4 TO_{t-1} + \beta_5 GEGDP_{t-1} \\ & + \beta_6 INF_{t-1} + \sum_{i=1}^p \theta_i \Delta GGDPC_{t-1} + \sum_{i=1}^q \gamma_i \Delta FD_{t-1} + \sum_{i=1}^r \delta_i \Delta FDI_{t-1} \\ & + \sum_{i=1}^s \varphi_i \Delta GEGDP_{t-1} + \sum_{i=1}^u \omega_i \Delta INF_{t-1} + \sum_{i=1}^w \mu_i \Delta TO_{t-1} + \vartheta_t \end{aligned}$$

Where Δ represents the initial difference, t the time period (year), and v_t is serially independent, homoscedastic, and normally distributed stochastic error term. The α is the intercept, β_1 , β_2 , β_3 , β_4 , β_5 , and β_6 are the coefficient of first order variables whereas θ_i , γ_i , δ_i , φ_i , ω_i , and μ_i are the parameters of the error correction model. The optimum values of lags p, q, r, s, u, and w is determined by using AIC and SC (BIC).

The model (1), (2), and (3) represent different models with different proxies of financial de-

velopment viz. Financial Development Index (FD_Index), Financial Institution Index (FII), and Financial Market Index (FMI).

The Granger Causality test was applied to determine the presence of unidirectional or bi-directional causality within the cointegrated time series. In cases where the variables are non-stationary at levels, the vector autoregressive (VAR) framework serves as an effective tool for conducting Granger causality tests. Employing the augmented VAR model, based on the Toda and Yamamoto (1995) procedure, enhances the accuracy of Granger causality tests, especially when dealing with non-stationary series. The selection of optimal maximum lags for both independent and dependent variables was guided by the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC) standards. Ensuring that the VAR model is devoid of autocorrelation and maintains dynamic stability is crucial for the validity and reliability of the causality analysis.

Result and Analysis

Unit Root Testing

Tables 1 and 2 display the outcomes of the unit root tests conducted using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) techniques. From these tests, it can be deduced that certain variables exhibited stationarity at their original levels, while others achieved stationarity after the first difference, according to both methods of unit root testing. Specifically, the Gross GDP per Capita (GGDPC) showed stationarity at the level according to the PP test, whereas the ADF test indicated it was stationary at the first difference. Furthermore, Foreign Direct Investment (FDI) was found to be stationary at the level using both testing methods, whereas the rest of the variables were stationary at the first difference. It is important to note that none of the variables were found to be stationary at the second difference or any higher levels, fulfilling a critical condition for the application of the Autoregressive Distributed Lag (ARDL) bounds test (Pesaran et al., 2001; Pesaran et al., 1999).

Table 1
Unit Root Test at Levels

Variables	Test with Intercept		Test with Intercept and Trend	
	ADF	PP	ADF	PP
GGDPC	-1.346642	-4.040315*	-2.584232	-3.856649*
FD_INDEX	0.624554	2.282302	-1.822241	-1.822241
FII	1.641223	2.149250	-1.858857	-1.479160
FMI	-0.850807	-1.468249	-1.453115	-0.572718
FDI	-3.341244*	-3.358963*	-3.734150*	-3.777035*

TO	-1.580375	-1.491025	-1.942245	-2.708929
INF	-3.310739 *	-3.363978*	-3.198781	-3.257456
GEGDP	-0.353244	-0.534725	-2.357952	-1.708543
Critical Value at 5% Level of Significance	-2.981038	-2.981038	-3.595026	-3.595026

Note. * Indicates Stationary at 5 percent Level of Significance

Table 2
Unit Root Test at First Difference

Variables	Test with Intercept		Test with Intercept and Trend	
	ADF	PP	ADF	PP
GGDPC	-7.968***	-18.501***	-7.878***	-18.666***
FD_INDEX	-7.410***	-7.593***	-7.765***	-8.678***
FII	-7.404***	-7.583***	-7.763***	-8.661***
FMI	-3.884***	-3.948***	-4.081**	-4.122***
FDI	-9.487***	-7.583***	-9.361***	-8.661***
TO	-5.084***	-5.017***	-5.122***	-5.055***
INF	-9.069***	-4.023**	-8.993***	-14.177***
GEGDP	-6.664***	-7.087***	-6.629***	-7.066***
Critical Value at 5% Level of Significance	-2.986***	-2.986***	-3.612199	-3.603***

ARDL Model Estimation

The Akaike Information Criterion (AIC) has been used to estimate the optimum lag length for ARDL model. The ARDL model selected for three different proxies of financial development are Coefficients ARDL (2, 0, 2, 2, 0, 2), ARDL (2, 0, 2, 2, 0, 2), and ARDL (2, 2, 2, 2, 0, 2).

Diagnostic Tests

The model demonstrates a strong fit, successfully passing all residual diagnostic tests. The R-Squared values for each of the three models are moderately high, indicating a satisfactory level of overall fit. The Durbin-Watson (DW) statistics for all models exceed the R-Squared values, affirming that the models are not spurious. Additionally, the rejection of the null hypothesis—that all regressors have zero coefficients—due to the computed F-statistics being higher for each model, further validates their efficacy. Diagnostic results presented in Table 3 confirm that the models are devoid of common regression issues such as serial correlation, incorrect functional form, deviations from normality, and heteroscedasticity, ensuring their

reliability and accuracy in predicting outcomes.

Table 3
Model Diagnostic Test Results

Test	Test-statistics			p-value		
	(1)	(2)	(3)	(1)	(2)	(3)
Breusch-Godfrey Serial Correlation LM Test	0.679	0.671	2.286	0.517	0.521	0.126
Breusch-Pagan-Godfrey Heteroskedasticity Test	1.626	1.625	1.264	0.144	0.144	0.298
Jarque-Bera Normality Test	0.355	0.354	0.346	0.837	0.838	0.841

ARDL Bound Test

After the model successfully passed all diagnostic checks, a bounds test was conducted to assess the presence of cointegration among the variables. This test utilizes the joint F-statistics alongside its asymptotic distribution, operating under the null hypothesis that there is no cointegration. The F-statistics values for all three models exceeded the critical upper bound values, even at a 1% significance level as shown in Table 4. This indicates a long-term relationship among the variables when economic growth is considered the dependent variable. To ensure the validity of this cointegration relationship and that it is not spurious, further verification was carried out using t-statistics, confirming the meaningfulness of the identified long-run relationship.

Table 4
ARDL Bound Test Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significant Level	I(0)	I(1)
F-statistic (Model 1)	11.50855	10%	2.525	3.56
F-statistic (Model 2)	11.48569	5%	3.058	4.223
F-statistic (Model 3)	15.11954	1%	4.28	5.84

Actual Sample Size: 39; K-Value: 5

Cross Checking for Cointegration

For the cross-checking purpose, the t-statistic on $GGDPC_{t-1}$ for each model is compared with the lower and upper bounds for t-statistics. The calculated value of t-statistics for all three model is -4.28 respectively. The bound value for the t-statistic at the 1%, 5%, and 10% signifi-

cance levels for a model with five variables are $[-3.43, -4.60]$, $[-2.86, -3.99]$, and $[-2.57, -3.66]$ respectively. It is evident that the computed t-statistics of $GGDPC_{t-1}$ exceeds the upper bound value concluding that the cointegrating relationship is either of the usual kind or is valid but degenerate.

Long-run and Short-run Relationship

Long-run relationship

Utilizing the Autoregressive Distributed Lag (ARDL) model with a maximum lag length of two, the analysis examined the long-term relationships within the economy. Table 5 details the long-run coefficient findings from this application, showcasing results across three models. These models respectively used the financial development index, financial institution index, and financial market index as diverse indicators of financial development. The results depicted in Table 5 reveal a consistently positive and statistically significant relationship between GDP per capita growth and each financial development indicator, affirmed at both 5% and 1% significance levels.

Moreover, positive correlations were identified between Foreign Direct Investment (FDI) and GDP per capita growth, alongside government expenditure and economic growth across all models, albeit with varying levels of significance—10% for the initial two models, and for the third model, 10% for FDI and 5% for government expenditure. The uniformity in the coefficients of the independent variables across the different models underscores the model's robustness and reliability, regardless of the financial development measure utilized. Additionally, the analysis highlighted a positive and significant connection between government expenditure and economic growth across various models at 10% and 5% significance levels. Trade openness and inflation were found to negatively impact GDP per capita growth, with their significance noted at 5% and 10% levels respectively in the final model. This nuanced analysis via the ARDL model illuminates the complex factors influencing economic growth, emphasizing the pivotal roles of financial development, FDI, government expenditure, and the impacts of trade openness and inflation.

Table 5
Long-Run Coefficients

Dependent (GGDPC)	Variable	(1)	(2)	(3)
FD_INDEX		14.95723** (5.897919)		
FII			7.607607** (3.013586)	
FMI				2496.984*** (714.7987)
FDI		2.570904* (1.492455)	2.578775* (1.494513)	3.076284* (1.555145)
TO		-0.027982 (0.020497)	-0.027934 (0.020523)	-0.046777** (0.021446)
INF		-0.030668 (0.046757)	-0.030691 (0.046832)	-0.080024* (0.044800)
GEGDP		0.665141* (0.327478)	0.665339* (0.327884)	0.825944** (0.331532)
C		-3.723653 (2.760024)	-3.721696 (2.763541)	-3.931867 (2.846429)

*Notes. p-values and any subsequent tests do not account for model selection

ARDL(2, 0, 2, 2, 0, 2); ARDL(2, 0, 2, 2, 0, 2); ARDL(2, 2, 2, 2, 0, 2)

FD_Index (t-stat) -8.052508

Short Run Dynamics

Table 6 highlights the model's short-term dynamics, showcasing a substantial long-term relationship between the variables through the significantly negative error correction term (ECT) coefficients, present at the 1% level in all three models. This indicates an effective mechanism for correcting short-term imbalances within the same period, with a notably quick adjustment rate, as evidenced by coefficients greater than 0.5. Utilizing the Error Correction Model

(ECM), this study analysed both the short-term relationships and the enduring impact of these relationships, with results detailed in Table 6.

From Table 6, it's evident that the delayed effects of GDP per capita growth, FDI, trade openness, and government expenditure substantially influence GDP per capita growth fluctuations. GDP growth and FDI are significantly impactful at the 1% level, whereas trade openness and government expenditure show a notable effect at the 5% level. Furthermore, the financial market index's lagged influence positively correlates with GDP per capita growth, attaining significance at the 5% level. An integral observation across all models is the model's ability to realign to its long-term equilibrium roughly sixteen months following a disturbance, tracing a trajectory of damped oscillations. This reveals the model's robustness in swiftly addressing short-term disequilibria and steering towards long-term stability.

Table 6
Short-run Dynamics Result

Dependent Variable (GGDPC)	(1)	(2)	(3)
D(GGDPC(-1))	0.603346*** (0.125115)	0.603765*** (0.125035)	0.563854*** (0.105939)
D(FMI)			8563.022* (4465.022)
D(FMI(-1))			-12305.29** (4465.630)
D(FDI)	2.366841 (1.609266)	2.359129 (1.607977)	2.956269* (1.494167)
D(FDI(-1))	-5.761777*** (1.634173)	-5.760406*** (1.632851)	-4.502622*** (1.460979)
D(TO)	0.198040*** (0.069745)	0.197934** (0.069693)	0.207372*** (0.063360)
D(TO(-1))	0.178462** (0.080299)	0.178725** (0.080246)	0.215830*** (0.075113)
D(GEGDP)	-0.597575 (0.376119)	-0.597271 (0.375836)	-0.368747 (0.334398)
D(GEGDP(-1))	-0.890814** (0.403749)	-0.890680** (0.403434)	-0.877625** (0.360587)
ECT	-0.75868*** (0.07918)	-0.76875*** (0.07803)	-0.71443*** (0.075854)

Note. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

Stability of Model

The structural stability of the model was assessed using the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) tests, with results illustrated in Figures 2, Figure 3, and Figure 4. To confirm stability, the CUSUM and CUSUMSQ plots must remain within the critical 5% confidence level boundaries. In all three models, the Figure 2, Figure 3 and Figure 4 shows that the plots consistently stayed within these boundaries, confirming the model's stability and showing no significant structural shifts at a 5% confidence level throughout the study period.

Figure 2
CUSUM and CUSUM of Squares for Model 1

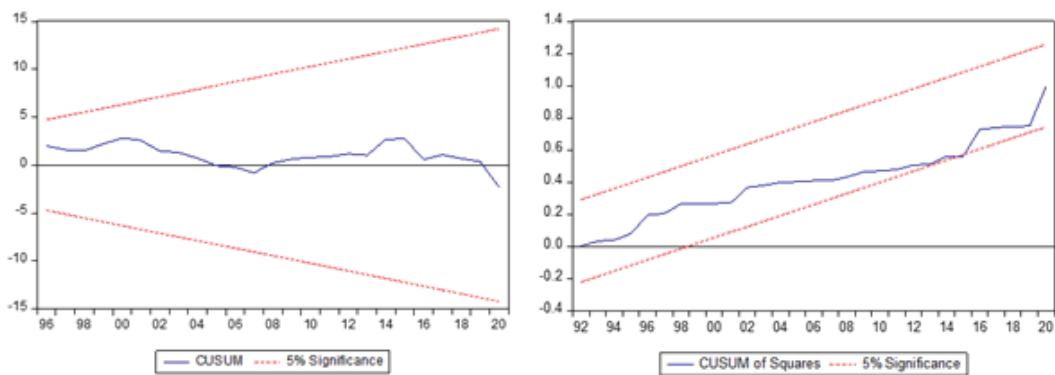


Figure 3
CUSUM and CUSUM of Squares for Model 2

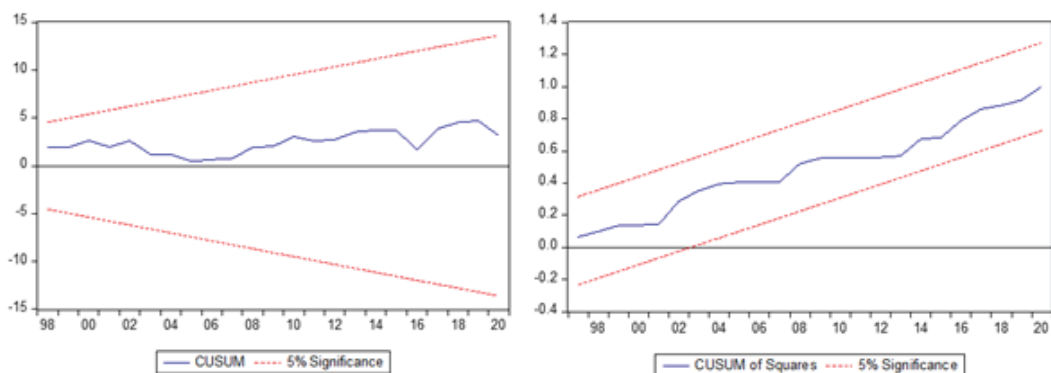
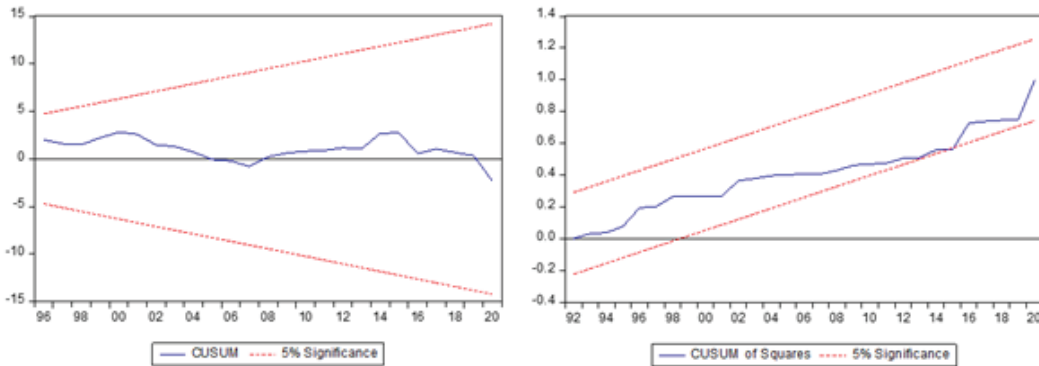


Figure 4
CUSUM and CUSUM of Squares for Model 3



Granger Causality Test

After analyzing the long-term and short-term relationships among the variables, the Granger causality test was utilized to explore the causality patterns between them. The existence of cointegration indicates the possibility of unidirectional or bidirectional Granger causality in the series, following Granger's (1969) hypothesis(Granger, 1969). Results from the Granger causality test, conducted using the augmented Vector Autoregression (VAR) model in line with the Toda-Yamamoto procedure, are detailed in Table 7.

Table 7
Pairwise Granger Causality Test

	GGDPPC	FD_Index	FII	FMI	FDI	Remarks
GGDPPC	-	2.345	2.348	0.208	2.240	-
FD_Index	3.659**	-	-	-	5.359***	FD_Index → GGDPC
FII	3.641**	-	-	-	5.352***	FII → GGDPC
FMI	8.158***	-	-	-	1.960	FMI → GGDPC
FDI	3.307**	1.659	1.652	1.873	-	FDI → GGDPC

Note. ** and *** denote statistical significance at the 5% and 1% levels respectively.

Table 7 presents the Granger causality test results, unveiling unidirectional Granger causality from all financial development indicators towards GDP per capita growth (GGDPC). The Granger causality from the financial development index and financial institution index to GDP per capita growth was statistically significant at the 5% level, whereas the causality from the financial market index to GDP per capita growth was significant at the 1% level. Additionally, a one-way Granger causal effect from foreign direct investment to GDP per capita growth was observed, significant at the 5% level.

These outcomes are in harmony with the findings of Paudel and Acharya (2020), who observed a positive link between financial development and economic growth. Conversely, these results significantly diverge from Shrestha (2005), who did not identify a substantial connection between financial development and economic growth within the context of Nepal.

Discussions

The variables in the study exhibited a positive trend throughout the observed period. Fluctuations in Nepal's GDP per capita (GGDPC) were primarily influenced by changes in the country's economic activities. Factors such as the growth in financial institutions, improved access to these institutions, monetary policy stability, and increased economic activities contributed to the steady rise in financial development. Meanwhile, variations and growth in foreign direct investment (FDI) in Nepal were attributed to heightened economic activities and political instability.

The analysis confirmed a cointegration among the variables, indicating a persistent long-term relationship. Significant findings include a positive correlation between GDP per capita growth and the financial development index, the positive impact of FDI on GDP per capita growth, and the role of government expenditure in promoting economic growth. The error correction model highlighted significant short-term effects, affirming the validity of these long-term relationships. The models consistently showed that after a short-term disturbance, equilibrium was regained within about 5 months through damped oscillations. Stability tests confirmed that the models were robust over both short and long terms, free from issues like heteroscedasticity, multicollinearity, and autocorrelation.

Granger causality tests identified a significant one-way causality from financial development indicators to GDP per capita growth, and a notable unidirectional causal relationship from both the financial development index and the financial institution index to FDI as indicated by other researchers (Bist, 2018; Durusu-Ciftci et al., 2017; Taddese & Abebaw, 2023; Tadesse & Abafia, 2019). However, the result from the study contrasts the outcomes from other studies where the researchers have found reverse unidirectional relationship (Adeyeye et al., 2015; Haque et al., 2022; Mengesha & Berde, 2023), bidirectional relationship (Nguyen et al., 2022; Nguyen & PHAM, 2021; Swamy & Dharani, 2019), and no relationship at all (Odhiambo & Nyasha, 2022; Okuyan, 2022).

These insights align with the research by Adhikari et al. (2023), Paudel (2020), Paudel and Acharya (2020), and Gautam (2015), all of which underscore the beneficial impact of financial development on economic growth in context of Nepal. Conversely, this research contrasts with Shrestha (2005), which found no significant link between financial development and economic growth in Nepal. Pradhan et al. (2019) observations of a consistent role of financial development and FDI in long-term economic performance, despite short-term inconsistencies, further corroborate the conclusions.

Conclusion and Implications

This study's findings highlight the pivotal roles of financial development and foreign direct investment (FDI) in fostering economic growth in Nepal. Drawing on Levine (1997) insights, it becomes evident that the synergy between financial development, FDI, and robust institutions is a key accelerator of economic progress. Consequently, it is imperative for Nepal's government and policymakers to formulate and implement strategies that bolster the financial sector and enhance financial development. Furthermore, efforts should be directed towards creating an environment conducive to FDI, as this is instrumental in driving economic development.

The government's role in crafting policies that not only strengthen the financial system but also attract foreign investment is crucial. By doing so, Nepal can harness the combined potential of these factors to catalyze economic growth and development. The findings of this study, therefore, underscore the urgency of policy interventions aimed at promoting financial development and encouraging FDI as means to stimulate economic advancement in Nepal.

Limitations and Future Research

This pioneering study explores the relationship between financial development, foreign direct investment (FDI), and economic growth in Nepal, marking a significant contribution to the literature. However, its findings carry certain limitations that warrant attention for future research. Primarily, the study's focus on Nepal means its conclusions may not directly apply to other developing nations. To broaden the applicability of these insights, subsequent analyses should encompass a range of developing countries, comparing and contrasting the dynamics of economic growth and financial development in varied contexts.

Moreover, while the study successfully uncovers the impact of FDI and financial development on economic growth, it does not account for other vital growth determinants, such as total factor productivity and institutional effectiveness, due to Nepal's data limitations. Future research should strive to include these variables, offering a comprehensive understanding of the myriad factors influencing economic development and refining policy recommendations.

Additionally, the study's reliance on a relatively small dataset of 41 data points may limit the robustness of its econometric analysis. Future studies could overcome this constraint by employing panel data from multiple countries with similar economic statuses, thereby expanding the dataset and enhancing the study's reliability and generalizability.

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