Dynamics of Financial Development and Foreign Direct Investment on Nepal's Economic Growth: A NARDL Analysis

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Abstract

This study explores the asymmetric effects of financial development and foreign direct investment (FDI) on economic growth in Nepal, employing the nonlinear autoregressive distributed lag (NARDL) model. The analysis reveals significant asymmetries in the effects of FDI and financial broadening in the economy by distinguishing between positive and negative shocks, the outcome indicates that positive shocks in financial sector growth significantly boost the economy, while negative shocks have a less pronounced and statistically insignificant effect. Similarly, positive shocks in FDI positively influence GDP per capita growth, whereas negative shocks are statistically insignificant. The robustness of these findings shows stable model parameters. The study underscores the importance of proactive policy measures to harness the positive impacts of financial development and FDI, thereby fostering sustained economic growth in Nepal. These insights contribute to the broader literature by highlighting the need for asymmetric analysis in understanding the complex dynamics of financial development, FDI, and economic growth in developing economies.

***Keywords*:** financial development, foreign direct investment, economic growth, NARDL model, asymmetric effects, developing economies

***JEL Classification*:** C22, E31, G10, O47

Introduction

The intricate relationship between financial development, foreign direct investment (FDI), and economic growth has been a subject of considerable academic interest, particularly for developing economies. Nepal, a South Asian country with a diverse economic landscape, provides a compelling case for examining these dynamics. The financial sector in Nepal has undergone significant reforms over the past few decades, aimed at enhancing its capacity to support economic development (Pandey, et al., 2022). Concurrently, the FDI inflow has been recognized as a critical driver for economic development, providing much-needed capital, technology transfer, and management expertise (Bhattarai, 2019).

However, the dynamics between financial sector growth, FDI, and GDP growth are not straightforward and may exhibit asymmetries. Traditional linear models using Autoregressive Distributed Lag (ARDL) in conjunction with the Error Correction Model (ECM) often fail to capture these nuances, leading to a growing interest in non-linear approaches Oskooee and Fariditavana (2016). The nonlinear autoregressive distributed lag

(NARDL) model has proven to be a powerful tool for examining asymmetric relationships, as it differentiates between the effects of positive and negative changes in independent variables on the dependent variable (Shin et al., 2014).

This study revisits the association between financial markets and institutions' growth, FDI, and the growth of the economy in Nepal by employing the NARDL approach. This approach seeks to offer a more detailed understanding of these variables' interactions and mutual influences over time. Specifically, the study seeks to address the following research questions: How do changes in financial development impact the Nepali economy? Does the FDI inflow have an asymmetric effect on the economy? How do these relationships evolve over different time horizons?

The results of this study are anticipated to enhance the existing literature in multiple ways. First, by providing empirical evidence from Nepal, it will add to the understanding of the financial development-FDI-growth nexus in developing countries. Second, the use of the NARDL approach will highlight the importance of considering asymmetries in economic relationships, which has significant policy implications. Policymakers in Nepal and similar developing economies can leverage these insights to design more effective strategies for fostering economic growth through financial development and FDI.

In the subsequent sections, we examine the relevant literature, describe the methodological framework, present the empirical findings, and discuss their policy implications and potential directions for future research.

Literature Review

The association between financial development, FDI, and growth has been extensively examined in the economic literature, with varying conclusions depending on the context and methodology used. The relationship between financial development, FDI, and economic growth has been extensively examined in the economic literature, with varying conclusions depending on the context and methodology used. This section reviews key studies that have contributed to understanding these dynamics, particularly focusing on the role of asymmetric effects in developing economies.

Financial Development and Economic Growth

The theoretical foundation for the association between financial development and growth in the economy is well established, with seminal works by Schumpeter (1911) and later by Goldsmith (1969), McKinnon (1973), and Shaw (1973). These studies argue that financial development facilitates economic growth by improving the efficiency of capital allocation, reducing transaction costs, and fostering innovation.

Empirical studies have provided mixed results. King and Levine (1993) showed a positive correlation of financial development with growth in the economy in a cross-section of countries. Similarly, Levine, Loayza, and Beck (2000) found a robust positive impact of growth in financial intermediaries on the acceleration of the economy. However, more recent studies, such as Aghion, Howitt, and Mayer-Foulkes (2005), highlight that the relationship may vary across different stages of economic development and institutional contexts.

Foreign Direct Investment and Economic Growth

FDI is considered a vital source of capital, technology transfer, and managerial expertise, which can spur economic growth in host countries. Borensztein, De Gregorio, and Lee (1998) demonstrated the positive impact of the influx of foreign investment on economic acceleration, contingent on the absorptive capacity of the recipient country, particularly its human capital. Alfaro et al. (2004) expanded this analysis by showing that the benefits of FDI are significantly influenced by the development of local financial markets.

However, literature also presents a nuanced argument. Carkovic and Levine (2005) demonstrated positive effects of foreign direct investment on the economy are not universal and depend on the quality of institutions and economic policies in the host country. Similarly, studies like that of Herzer, Klasen, and Nowak-Lehmann (2008) indicated that the influence of FDI on growth can vary, with the potential for both positive and negative outcomes depending on the particular context of each country.

Asymmetric Effects and NARDL Approach

Traditional linear models often fail to capture the complex and potentially asymmetric relationships among financial development, FDI, and economic development. The NARDL approach, introduced by Shin, Yu, and Greenwood-Nimmo (2014), provides a framework to model such asymmetries. This method allows for the differentiation between the effects of positive and negative changes in explanatory variables on the dependent variable, offering a more nuanced understanding of economic relationships.

Several studies have applied the NARDL model to explore asymmetries in economic relationships. For instance, Bahmani-Oskooee and Fariditavana (2016) employed NARDL to analyze the nonlinear impact of exchange rate changes on trade balances, revealing significant differences between the impacts of currency appreciations and depreciations. Similarly, Nkoro and Uko (2016) used NARDL to investigate the nonlinear dynamics among oil prices and growth in the economy of Nigeria, highlighting the importance of considering non-linear effects in economic analysis.

Empirical Studies in Nepal

Research on the relationship between financial development, FDI, and economic growth in Nepal is relatively sparse. Pandey et al. (2022) explained that various reforms in Nepal have taken place to boost the financial sector specifically highlighting the reforms taken by Nepal Government and Nepal Rastra Bank (NRB) to strengthen the banking and financial institutions in Nepal. Bista (2005) investigated the role of FDI in Nepal's economic growth, finding a positive but modest impact. Similarly, Acharya (2017) examined the impact of financial development on growth in the economy of Nepal, concluding the existence of a positive relationship with the underdevelopment of the financial sector limiting its potential growth-enhancing effects. Gajurel et al. (2022) found that financial sector development played a crucial role in driving economic growth in Nepal. However, significant negative asymmetrical effects presented challenges to sustained long-term growth. Along with financial sector progress, factors such as inflation and learning by doing also contributed to growth.

This study aims to build on these existing works by employing the NARDL approach to capture potential asymmetries in the relationship between financial development, FDI, and

economic growth in Nepal. By doing so, it seeks to bring a more holistic understanding of these dynamics offering insights for policymakers aiming to foster economic growth in the country.

Data and Methodology

Data

This study used data from the World Bank and IMF to analyze the asymmetric relationship among economic growth, financial development and foreign direct investment (Svirydzenka, 2016; World Bank, 2022). GDPPCG represents the annual growth in GDP per capita (in percentage), and FDI represents the financial development index ranging from 0 to 1 where 1 is the highest financial development index. FDI is taken as a ratio of foreign direct investment to GDP for normalization. GCF represents the ratio of gross capital formation to GDP. INF represents consumer price index inflation. TO represents the ratio of total exports and imports to GDP. GEGDP represents the ratio of government expenditure to the GDP. The data ranges from 1980-2021. GCF, INF, TO, and GEGDP are the control variables that have been used which have a positive impact on economic growth.

Methodology

Previous studies that explored the impact of financial sector improvement and inflow of foreign investment on the performance of the economy have involved symmetric effect analysis using ARDL, cointegration, ECM, and Granger causality analysis. These techniques are not sufficient to examine the asymmetric relationship among the dependent and independent variables (Shin et al., 2014). We used the method put forward by Shin et al. (2014) in conjunction with the methods used by Pesaran et al. (2001) and Pesaran et al. (1999).

Based on empirical studies within the Nepalese context, this study estimated the non-linear relationships among the variables of interest (Dangal et al., 2023; Gajurel et al., 2022). Equation 1 represents the asymmetric long-run relationship among growth in GDP per capita, financial development, and FDI is represented by equation 1.

$$GDPPCG_t = \alpha_0 + \alpha_1{}^{+}FDev_t{}^{+} + \alpha_1{}^{-}FDev_t{}^{-} + \alpha_2{}^{+}FDI_t{}^{+} + \alpha_2{}^{-}FDI_t{}^{-} + \alpha_3 CV_t + \varepsilon_t \quad (1)$$

where GDPPCG is GDP per capita growth rate, FD_Index is financial development index developed by IMF, FDI is the ratio of inflow of foreign investment to GDP, and CV is the control variables used in the analysis. The dependent variables and independent variables are integrated of level 0 or 1. $\alpha = (\alpha_0, \alpha_1{}^{+}, \alpha_1{}^{-}, \alpha_2{}^{+}, \alpha_2{}^{-}, \alpha_3)$ are long-run coefficients of independent variables. The $FD\_Index_t{}^{+}$, $FD\_Index_t{}^{-}$, $FDI_t{}^{+}$, and $FDI_t{}^{-}$ are the partial sum of the positive and negative variations in FD_Index and FDI, respectively which are mathematically shown in Equations 2-5.

$$FD_{Index_t}{}^{+} = \sum_{i=1}^{t} \Delta FDev_i{}^{+} = \sum_{i=1}^{t} \max(\Delta FDev_i, 0) \quad (2)$$

$$FD\_Index_t{}^{-} = \sum_{i=1}^{t} \Delta FDev_i{}^{-} = \sum_{i=1}^{t} \min(\Delta FDev_i, 0) \quad (3)$$

$$FDI_t{}^{+} = \sum_{i=1}^{t} \Delta FDI_i{}^{+} = \sum_{i=1}^{t} \max(\Delta FDI_i, 0) \quad (4)$$

$$FDI_t^- = \sum_{i=1}^{t} \Delta FDI_i^- = \sum_{i=1}^{t} \min(\Delta FDI_i, 0) \quad (5)$$

To run the ARDL or NARDL model, the variables of interest can be integrated of order zero or one or mixed among I (0) and I (1). However, the variables cannot be integrated in order two or higher. Thus, the unit root tests using augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were conducted for all the variables (Ahmad et al., 2018). It was found that the variables were either I (0) or I (1). This opened the path for further analysis. The above equations using the partial sum decomposition have been used to model the asymmetric cointegration between the unemployment and output examining the non-linear relationship (Schorderet, 2003). It has also been used to examine the non-linear relationship between unemployment and output in three industrialized countries.

$$\begin{aligned}\Delta GDPPCG_t = {} & \alpha_0 + \alpha_1{}^+ FDev_{t-1}{}^+ + \alpha_1{}^- FDev_{t-1}{}^- + \alpha_2{}^+ FDI_{t-1}{}^+ + \alpha_2{}^- FDI_{t-1}{}^- + \alpha_3 CV_{t-1} \\ & + \sum_{i=1}^{a} \beta_i \Delta GDPPCG_{t-i} + \sum_{i=1}^{b} \left(\gamma_i{}^+ \Delta FDev_{t-i}{}^+ + \gamma_i{}^- \Delta FDev_{t-i}{}^-\right) \\ & + \sum_{i=1}^{c} \left(\delta_i{}^+ \Delta FDI_{t-i}{}^+ + \delta_i{}^- \Delta FDI_{t-i}{}^-\right) + \sum_{i=1}^{d} \mu_i \Delta CV_{t-i} + \varepsilon_t \end{aligned} \quad (6)$$

$\sum_{i=1}^{b} \gamma_i{}^+$ evaluates the short-run impact of the increase in financial development on economic growth while $\sum_{i=1}^{b} \gamma_i{}^-$ provides the short-run impact of decrease in financial development in the economy. Similarly, $\sum_{i=1}^{c} \delta_i{}^+$measures the short-run impact of the increase in foreign direct investment on economic growth while $\sum_{i=1}^{c} \delta_i{}^-$ measures the short-run impact of the decrease in foreign direct investment on economic growth. Thus, this model and the asymmetric long-run model together capture the short-run and long-run asymmetric impact of variations in financial development and FDI on economic growth.

The ECM of the NARDL model is shown in Equation 7.

$$\begin{aligned}\Delta GDPPCG_t = {} & \sum_{i=1}^{a} B_i \Delta GDPPCG_{t-i} + \sum_{i=1}^{b} \left(Y_i{}^+ \Delta FDev_{t-i}{}^+ + Y_i{}^- \Delta FDev_{t-i}{}^-\right) \\ & + \sum_{i=1}^{c} \left(D_i{}^+ \Delta FDI_{t-i}{}^+ + D_i{}^- \Delta FDI_{t-i}{}^-\right) + \sum_{i=1}^{d} M_i \Delta CV_{t-i} + J_i ECT_{t-i} + \vartheta_t \end{aligned} \quad (7)$$

Where B_i and M_i are the short-run coefficients, J_i is the coefficient of short-run error correction term while Y_i^+, Y_i^-, D_i^+, and D_i^- are the adjustments for the short-run asymmetry.

The estimation process for the NARDL involved several key steps to ensure robustness and accuracy. Initially, the ARDL approach was employed due to its flexibility with variables that are integrated of order zero ($I(0)$) one ($I(1)$), or a combination of both. Crucially, it is imperative to conduct a unit root test to confirm that none of the variables were integrated of order two ($I(2)$), as the presence of an $I(2)$ variable would make the cointegration spurious. To address this, the ADF and PP unit root tests were commonly applied to determine the order of integration.

Following this, Equation 3 was estimated, using the ordinary least squares (OLS) method. To enhance the final model specification, the general-to-specific approach was adopted, which involved systematically reducing the model by eliminating insignificant lags (Katrakilidis & Trachanas, 2012). After estimating the NARDL model, the bounds testing

technique was employed to test for a long-run relationship among the variables. If cointegration is detected, the next step involves analyzing both long-run and short-run asymmetries in the relationships between economic growth, foreign direct investment, and financial development. This comprehensive analysis allows for drawing meaningful inferences about the dynamic interactions between these variables. By following these steps, the NARDL technique provides a robust framework for examining the complex and potentially asymmetric relationships in economic data.

Result and Analysis

Before conducting cointegration analysis for time series data, it is essential to perform stationarity tests to prevent spurious results when variables are non-stationary (Gujarati & Porter, 1999). Additionally, the bounds testing approach requires that none of the variables be integrated of order two; rather, they should display a mixed order of integration. To ensure this, the ADF and PP unit root tests are employed. The tests are conducted with consideration of constant and trend terms. The Schwarz Information Criterion (SIC) is utilized to determine the optimal lag order for the ADF test equation.

Cointegration analysis for time series data is always preceded by stationarity tests to avoid spurious results when dealing with non-stationary variables (Gujarati & Porter, 1999). Furthermore, a prerequisite of the bounds testing approach is that no single variable is integrated of order two; instead, they should exhibit a mixed order of integration. To fulfill this condition, augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are utilized. The findings of these tests are depicted, with both constant and trend terms included in the analysis. For the ADF test Equation, the Schwarz Information Criterion (SIC) was used to determine the optimal lag order.

Both the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests in Table 1 reveal that GDP per capita growth (GDPPCG), government expenditure to GDP (GEGDP), and inflation (INF) were integrated of order zero *I*(0). On the other hand, foreign direct investment (FDI) and gross capital formation (GCF) were found to be either integrated of order zero *I*(0) or one *I*(1). Financial development (FDEV) and trade openness (TO) were confirmed to be integrated of order one *I*(1). These results indicated a mixed order of integration between *I*(0) and *I*(1) variables, thereby necessitating the use of the bounds testing approach for further analysis.

Table 1

Unit Root Test at Levels and First Difference

Variables	ADF				PP			
	Level		First Difference		Level		First Difference	
	Constant	Constant and Trend	Constant	Constant and Trend	Constant	Constant and Trend	Constant	Constant and Trend
GDPPCG	-8.238***	-4.897***	-7.946***	-8.185***	-8.513***	-20.507***	-23.739***	-23.489***
FDev	0.447	-2.075	-7.796***	-8.104***	2.052	-2.075	-8.049***	-9.765***
FDI	-1.816	-4.260***	-10.346***	-10.218***	-3.052**	-4.260***	-13.396***	-13.281***
GCF	-1.789	-4.268***	-8.583***	-8.465***	-1.498	-4.249***	-20.811***	-20.452***
INF	-4.231***	-4.762***	-8.151***	-8.039***	-4.147***	-4.788***	-24.716***	-24.230***
TO	-1.580	-1.942	-5.688***	-5.686***	-1.491	-2.709	-5.675***	-5.658***
GEGDP	-4.064***	-4.148***	-6.984***	-7.024***	-4.070***	-4.088***	-7.582***	-7.024***

Note. *** indicates significance at 1%, ** indicates significance at 5%, and * Indicates significance at 10%.

In the initial stage of the NARDL analysis, the positive and negative factors of financial development and foreign direct investment are distinguished. Figure 1 illustrates the positive components of financial development on the left side, while the right side displays the negative components. Similarly, Figure 2 presents the decomposed elements of foreign direct investment, with the left graph indicating the positive components and the right graph depicting the negative components. This differentiation is crucial for understanding the asymmetric effects in the NARDL framework.

Figure 1

Decomposition of Financial Development

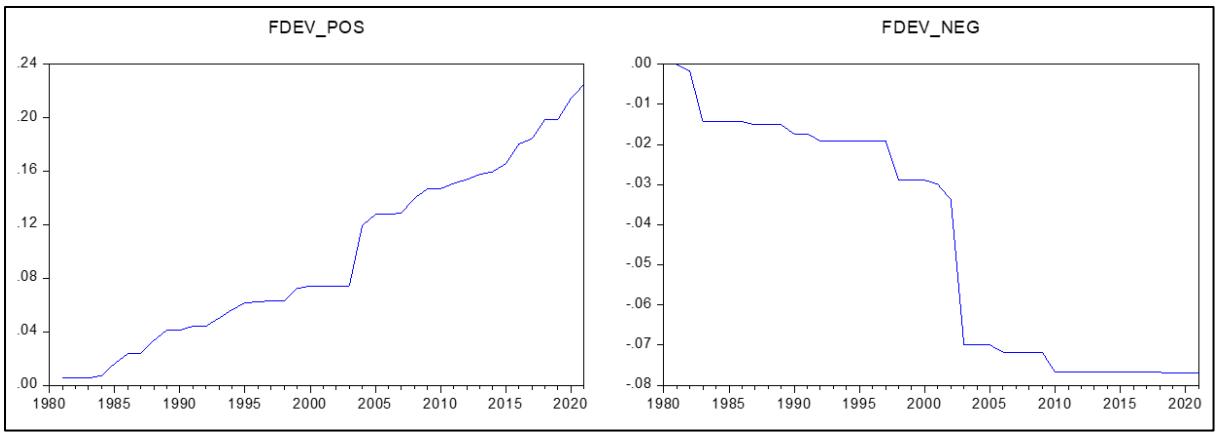


Figure 2

Decomposition of FDI

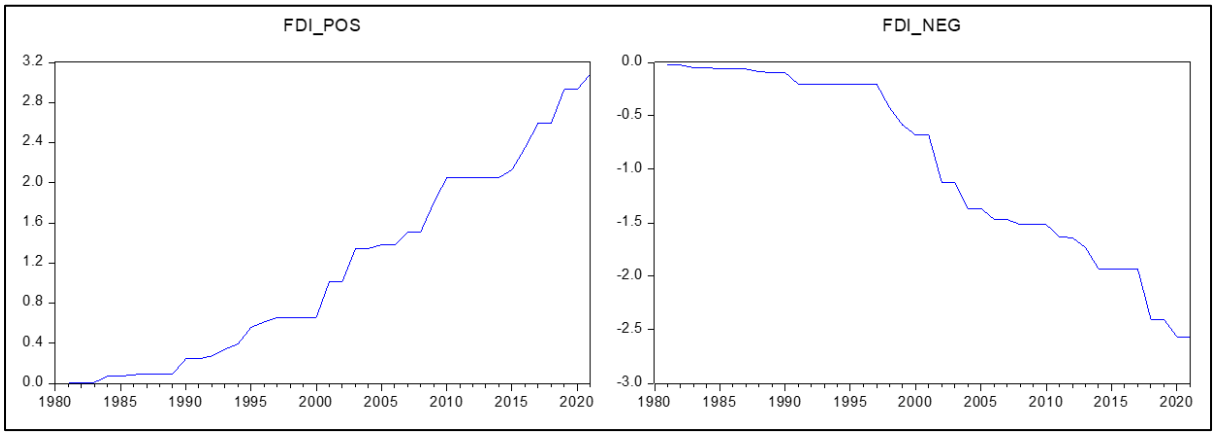


Table 2 presents the long-run coefficients from the NARDL analysis, which investigates the asymmetric effects of financial development and foreign direct investment on economic growth in Nepal. The results reveal that the positive component of financial development has a statistically significant positive impact on the economy. Additionally, the negative component of financial development also shows a positive coefficient, indicating that a decrease in financial development leads to a decline in GDP per capita growth.

Similarly, both the positive and negative components of FDI exhibit positive coefficients. This suggests that an increase in FDI boosts economic growth, while a decrease in FDI hampers it. The results for financial development are statistically significant at the 1% level, underscoring their robustness. In contrast, the positive component of FDI is significant at the 5% level, while the negative component of FDI is statistically insignificant. These

findings underscore the importance of financial development and FDI in driving economic growth, with asymmetric effects playing a crucial role in this dynamic. The significant positive impact of financial development highlights its pivotal role in Nepal's economic landscape.

Table 2

Long-run Relationship Analysis Using ARDL (2, 2, 2, 1, 1, 2, 1, 1, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDEV_POS	15.92029	5.435932	2.928751	0.0060
FDEV_NEG	1.098771	5.636310	3.080867	0.0039
FDI_POS	10.73467	7.532915	2.387395	0.0223
FDI_NEG	7.744277	6.812322	1.467186	0.1510
GCF	6.095027	0.620787	2.054793	0.0577
INF	-0.090133	0.037849	-2.381387	0.0309
TO	0.158669	0.024641	2.229621	0.0363
GEGDP	0.161436	0.201617	0.800709	0.4358
@TREND	0.821735	0.113317	3.637595	0.0015

The *F*-bound test was performed to verify the presence of cointegration between the dependent and independent variables over the long run. The *F*-statistic value of 5.90 exceeds the upper bound critical value at the 1% significance level. This result indicates a strong presence of cointegration among economic growth, financial development, and foreign direct investment, confirming that these variables are linked in the long term.

Table 3 highlights the model's short-term dynamics and underscores a substantial long-term relationship between the variables, as evidenced by the significantly negative error correction term (ECT) coefficient, significant at the 1% level. This indicates an effective mechanism for correcting short-term imbalances within the same period, with a notably rapid adjustment rate, as evidenced by coefficients greater than 0.5. Utilizing the error correction model (ECM), we analyzed both the short-term interactions and the enduring impacts of these relationships. The detailed results in Table 3 illustrate the immediate and persistent effects of financial development and foreign direct investment on economic growth, confirming the model's robustness in capturing these dynamics.

The result reveals that the first lag of the difference in GDPPCG has a positive and statistically significant impact on the current period's change in GDPPCG. Additionally, the current period's positive component of financial development positively influences GDPPCG, with this impact being statistically significant at the 5% level. Conversely, the negative component of financial development exerts a statistically significant negative effect on the change in GDP per capita growth rate.

Moreover, both the positive and negative components of foreign direct investment have statistically significant positive impacts on GDP per capita growth in the short run. A critical observation shows that the growth rate realigns to long-term equilibrium approximately nine months after a disturbance, following a pattern of damped oscillations. This demonstrates the model's robustness in quickly addressing short-term disequilibria and steering towards long-term stability.

Table 3

Short-run Relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.10823	0.471158	-4.059132	0.0005
D(GDPPCG(-1))	0.460740	0.050511	2.646014	0.0183
D(FDEV_POS)	16.89157	1.015083	2.623173	0.0129
D(FDEV_POS(-1))	1.955290	0.672910	0.344671	0.7325
D(FDEV_NEG)	17.04565	2.884595	3.689629	0.0022
D(FDEV_NEG(-1))	-9.72947	2.735060	-3.253532	0.0053
D(FDI_POS)	0.474137	1.133568	2.389427	0.0304
D(FDI_NEG)	-1.738802	1.163200	-2.772456	0.0142
D(GCF)	5.374801	0.439331	2.065543	0.0566
D(GCF(-1))	1.781816	0.402392	2.054793	0.0577
D(INF)	-0.143594	0.028213	-1.994994	0.0645
D(TO)	0.102714	0.037048	0.728768	0.4774
D(GEGDP)	0.037944	0.170263	2.471041	0.0259
D(GEGDP(-1))	0.420342	0.170107	-0.787474	0.4433
CointEq(-1)*	-1.361756	0.089687	-26.33344	0.0000
R-squared	0.985274	F-statistic		22.06623
Adjusted R-squared	0.976684	Prob(F-statistic)		0.000032
S.E. of regression	0.611742	Durbin-Watson stat		2.551239

* p-value incompatible with t-bounds distribution.

The structural stability of the model was assessed using the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) tests, with the outcomes illustrated in Figure 3 and Figure 4. For the model to be deemed stable, the CUSUM and CUSUMSQ plots must stay within the critical boundaries at the 5% confidence level. The plots consistently remained within these boundaries, confirming the model's stability and indicating that there were no significant structural shifts at the 5% confidence level throughout the study period.

Figure 3

CUSUM of Squares

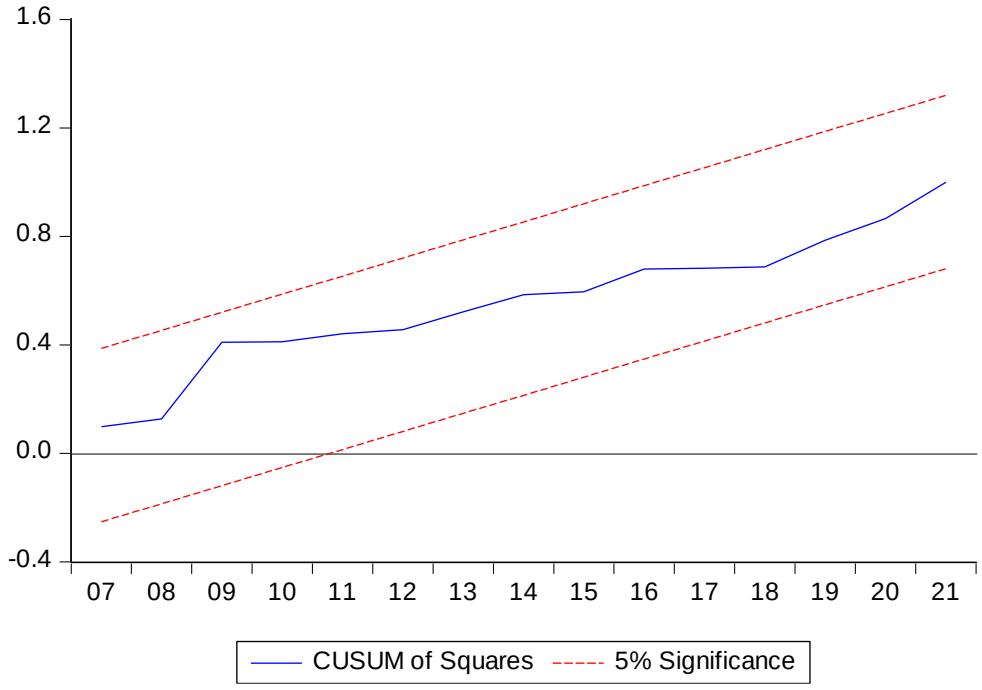
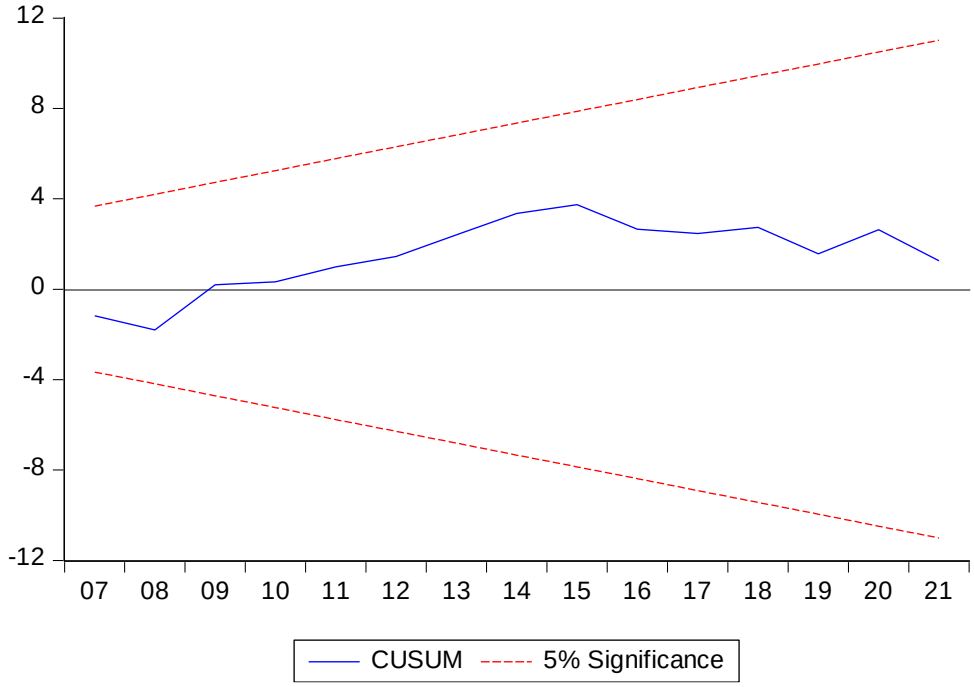


Figure 4

CUSUM Test



Asymmetric Multiplier

The dynamic multiplier graph in the NARDL model is plotted to assess how asymmetries adjust during the transition from the current long-run equilibrium to a new long-run equilibrium following positive and negative shocks (Shin, 2014). Figures 4 and 5 illustrate the linear combination of dynamic asymmetric multipliers resulting from positive and negative shocks in financial development and foreign direct investment (FDI). The horizontal axis represents the years from the shock, while the vertical axis indicates the magnitude of the impact on GDP per capita growth due to a unit shock in FDI and financial development.

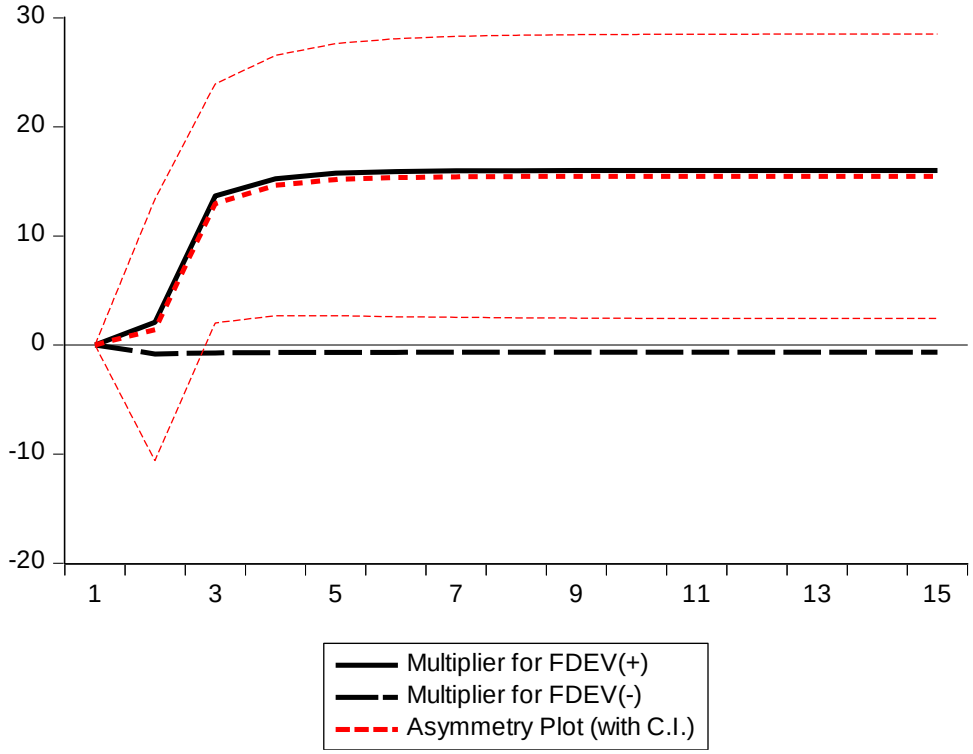
Figure 5 shows that the thick black line representing positive shocks in financial development remains well within the confidence interval for the asymmetric effect plot, indicating a significant impact of positive shocks on GDP per capita growth. Conversely, the graph reveals that the dotted black line for negative shocks in financial development lies outside the 5% confidence interval (depicted by thin red dotted lines), indicating no significant impact of negative shocks on GDP per capita growth. These results suggest that positive financial development shocks have a more substantial influence on GDP per capita growth in the long run compared to negative shocks, demonstrating a pronounced positive asymmetry.

This suggests that positive financial development shocks have a significant and lasting impact on GDP per capita growth in Nepal, indicating that improvements in the financial sector can substantially drive economic progress. The pronounced positive asymmetry implies that the economy benefits more from enhancements in financial development than it suffers from setbacks. This highlights the importance of policies aimed at strengthening the financial sector, as positive developments in this area can lead to sustained economic growth. Conversely, the limited impact of negative financial shocks suggests that

the economy is somewhat resilient to financial downturns, although continual improvement in financial regulations and practices remains crucial to maximize growth potential.

Figure 5

Dynamic Asymmetric Multiplier of FDEV on GDPPCG

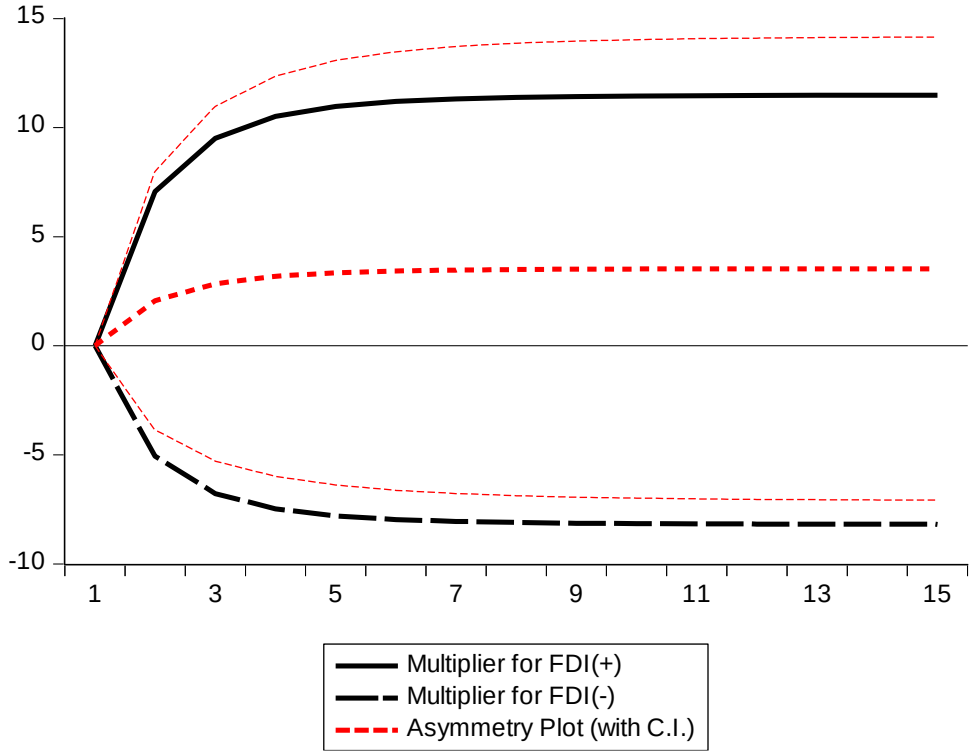


The dynamic asymmetric multiplier graph for FDI in Figure 6 shows that positive shocks in FDI, represented by the thick black line, have a statistically significant positive impact on GDP per capita growth. In contrast, the negative shocks in FDI, indicated by the thick black dotted line, lie outside the confidence interval (shown by light red dotted lines), signifying a statistically insignificant relationship. Overall, the dynamic multiplier graph for FDI indicates that positive FDI shocks have a more substantial impact on GDP per capita growth in the long run compared to negative FDI shocks, underscoring a significant positive asymmetry. These findings underscore the differential impacts of positive and negative shocks in both financial development and FDI on economic growth, with positive shocks having a more substantial and statistically significant effect in the long-run.

It suggests that positive shocks in FDI significantly boost GDP per capita growth in Nepal, demonstrating that inflows of FDI effectively contribute to long-term economic development. This underscores the critical role of FDI in enhancing productivity, technology transfer, and overall economic performance. Conversely, negative FDI shocks do not have a significant impact, indicating that the economy is somewhat insulated from the adverse effects of declining FDI. The pronounced positive asymmetry in the effects of FDI shocks highlights the greater importance and beneficial impact of attracting positive FDI inflows compared to the relatively muted effects of negative FDI movements. Consequently, policymakers should prioritize creating a favorable environment for FDI to maximize economic growth benefits.

Figure 6

Dynamic Asymmetric Multiplier of FDI on GDPPCG



Discussion and Conclusion

The results of this study offer valuable insights into the asymmetric effects of financial development and foreign direct investment (FDI) on economic growth in Nepal. Utilizing the NARDL model, we uncovered significant asymmetries in how positive and negative shocks in financial development and FDI impact GDP per capita growth. These findings align with the findings of Gajurel et al. (2021), Paudel and Acharya (2020), and Paudel (2020) and extend the existing literature on the economic dynamics of developing countries.

The analysis shows that positive shocks in financial development have a substantial and statistically significant positive impact on GDP per capita growth in the long run, while negative shocks are less influential and statistically insignificant. This result is consistent with the broader literature that emphasizes the critical role of financial development in economic growth. For instance, Levine (2005) highlighted that a well-developed financial sector enhances growth by improving resource allocation, reducing transaction costs, and fostering innovation.

The positive asymmetry observed in this study suggests that improvements in financial development, such as increased access to financial services, better regulation, and more robust financial institutions, are crucial for sustaining economic growth in Nepal. This aligns with the findings of King and Levine (1993) and Rousseau and Wachtel (2000), who demonstrated that financial development is particularly beneficial for growth in countries with evolving financial systems.

The impact of FDI on economic growth also exhibits significant asymmetry. Positive shocks in FDI have a pronounced and statistically significant positive effect on GDP per capita growth, while negative shocks do not significantly influence growth. This finding supports the notion that FDI plays a vital role in fostering economic development by bringing in capital, technology, and managerial expertise, as suggested by Borensztein, De Gregorio, and Lee (1998), and Alfaro et al. (2004).

The asymmetric impact of FDI highlights the importance of maintaining a conducive environment for foreign investors. Policies aimed at enhancing the investment climate, such as improving infrastructure, ensuring political stability, and providing fiscal incentives, can help attract and retain FDI, thereby driving economic growth. This perspective is reinforced by Hermes and Lensink (2003), who argued that the benefits of FDI are maximized in the presence of a well-developed financial sector.

The significant asymmetries observed in the effects of financial development and FDI underscore the need for targeted policy interventions. Policymakers should focus on enhancing the positive impacts of these variables while mitigating potential negative effects. For financial development, this could involve strengthening regulatory frameworks, promoting financial literacy, and ensuring broad access to financial services. For FDI, maintaining an attractive investment climate and fostering strong linkages between foreign and domestic firms are essential.

Furthermore, the findings suggest that positive shocks have a more substantial and lasting impact on economic growth compared to negative shocks. This implies that efforts to stimulate financial development and attract FDI can yield significant long-term benefits for the economy. The robustness of the model, as evidenced by the CUSUM and CUSUMSQ tests, further validates these conclusions, indicating that the model effectively captures the dynamics of economic growth in Nepal.

Overall, this study contributes to the existing literature by highlighting the asymmetric effects of financial development and FDI on economic growth in Nepal. The results underscore the importance of proactive policy measures to harness the positive impacts of these variables, thereby fostering sustained economic growth.

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