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Impact of Fiscal and Financial Dynamics on Shaping the Development in Nepal

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Abstract

This study attempts to explore the fiscal and financial dynamics of the economic development in Nepal. Employing robust ordinary least squares (OLS) with time series spanning from 1993 to 2022, this study examined the long-run impact of various fiscal and financial variables on Nepal's GDP. Before it, this study pretested cointegration between studied variables and failed to find any evidence of such a long relationship. Thus, the findings of OLS indicated that value-added tax (VAT) and investment significantly drive GDP growth, while income tax and remittances have no significant impact on GDP in Nepal. The study thus suggests that policymakers should focus on proper channelization of income tax and remittance inflows with VAT and investment for the economic development of Nepal.

Keywords: Taxation, Investment, Remittance, Nepalese economy, OLS

Introduction

The fiscal elements encompassing fiscal policies, such as taxation and government spending, along with financial elements such as investment and remittances, have been pivotal in shaping the economic landscape of developing nations (Keen & Mansour, 2018; Gajurel, et al., 2021; Pandey, et al. 2022; Adhikari, et al., 2023). These components have collectively influenced the allocation of resources, the distribution of wealth, and the overall economic productivity, which are essential for achieving sustainable growth. Taxation, particularly income tax and value-added tax (VAT) have served as a primary source of revenue for the government, enabling public investment in infrastructure, education, and social services (Keen & Mansour, 2018; Khadka, 2018; Keen & Mansour, 2018). Income tax is considered a major source of government revenues that has played a vital role in financing public services and infrastructure, which are essential for fostering economic development (Keen & Mansour, 2018). It has served as a primary source of government revenue in Nepal, facilitating public expenditure on infrastructure, education, health, and social welfare programs (Khadka, 2018). It is essential for funding public services and infrastructure projects, thus creating a foundation for economic development (Shrestha, 2022). However, the country's income tax system faces challenges including a narrow tax base, widespread tax evasion, and administrative inefficiencies, which hinder optimal revenue collection and equitable wealth distribution (Adhikari, 2020). Strengthening tax administration and broadening the tax base is essential to enhancing revenue mobilization and fiscal stability. VAT is a more reliable revenue source in these economies due to its broad-based nature. It has helped stabilize government revenues, even amid economic downturns, supporting sustained public investment and consumption (Bird & Gendron, 2020). Despite its benefits, can be regressive, disproportionately affecting lower-income households, and its implementation can be complicated by compliance issues in the informal sector (Ebrill et al., 2001). The effectiveness of taxation in driving GDP growth in developing economies is often limited by challenges such as a narrow tax base, tax evasion, and administrative inefficiencies (Fjeldstad & Heggstad, 2016). Additionally, in economies like Nepal, VAT provides a relatively stable revenue stream but also faces issues related to compliance and the regressive nature of consumption taxes, which disproportionately affect lower-income households (Adhikari & Pant, 2020).

The investment including domestic and foreign has another critical financial element that directly impacts capital formation, productivity, and employment. It has been playing crucial roles in capital formation, job creation, and productivity improvements, which are essential for sustained GDP growth. In developing economies, attracting and sustaining investment is often challenging due to political instability, inadequate infrastructure, and regulatory barriers (Asiedu, 2006). In Nepal domestic and foreign investments are crucial for fostering industrial growth, enhancing productivity, and generating employment, thereby directly impacting GDP growth (Poudel & Bhattarai, 2019). Nepal, in particular, struggles with creating a conducive environment for investment, which hampers its ability to achieve higher levels of economic growth (Poudel & Bhattarai, 2019).

Remittances, a significant financial inflow for many developing countries, have played a vital role in enhancing household incomes, driving consumption, and supporting small-scale investments (Ratha, 2013). While remittances contribute positively to GDP, overreliance on them can lead to economic vulnerabilities, particularly when these inflows fluctuate due to global economic conditions (Adams, 2011). Remittances have constituted a vital component of Nepal's economy, accounting for a significant portion of GDP and serving as a lifeline for many households (World Bank, 2021). They have contributed to poverty reduction, increased household consumption, and investment in health and education sectors (Pant, 2011). Remittances, which account for a substantial portion of Nepal's GDP, have become a lifeline for many households, driving consumption and investment at the grassroots level (Sapkota, 2018). Nonetheless, over-reliance on remittances exposes the economy to external shocks and may lead to labour shortages in domestic markets (Sapkota, 2013). Diversifying the economy and creating domestic employment opportunities are imperative to mitigate these vulnerabilities.

Nepal is a developing nation with a mixed economy and significant reliance on agriculture and remittances. This study has endeavored to understand the impact of these fiscal and financial elements that have formulated effective economic policies for long-term growth and development. This study has focused on income tax and VAT as fiscal elements, and remittances and investment as financial elements. Moreover, this study aimed to analyze the impact of such elements on the growth and development of Nepal, which is crucial in shaping the Gross Domestic Product (GDP) and development. For this, an effort has been made by the interplay between these complex elements, as each has distinct mechanisms that affect economic growth and development in the long run.

Reviewing these previous works of literature on income tax, VAT, remittances, and investment, this study has integrated to analyze Nepal's economic prosperity. Each element has been presenting unique opportunities and challenges. This study has focused on countries to maximize economic development and growth sustainability by addressing the significance and challenges in these fiscal and financial components. However, the effectiveness of these elements depends on how they are managed and integrated into the broader economic framework. Future policies should focus on optimizing taxation, improving the efficiency of government spending, attracting more investment, and channeling remittances into productive sectors to ensure sustainable development. Understanding their impact has been essential for policymakers and other stakeholders to design strategies that promote sustainable and inclusive economic growth and development in Nepal.

Literature Review

Theoretical perspectives on the impact of taxation, government spending, investment, and remittances on growth and development have evolved significantly from the previous works. The neoclassical growth theory posited that taxation and government spending influenced the economy by affecting capital accumulation and productivity (Solow, 1956). Recent studies extended this by examining the distortionary effects of high taxes on private investment, which dampened economic growth (Shrestha & Singh, 2017). Conversely, the Keynesian theory suggested that government investment, particularly during economic downturns, stimulated demand and drove growth (Keynes, 1936). These views were supported by empirical research, emphasizing the role of public investment in infrastructure, in fostering development (Bhusal & Sapkota, 2018). Investment including domestic and foreign, remained crucial for growth, with the endogenous growth theory highlighting the role of technological spillovers from FDI in enhancing productivity (Romer, 1990). Remittances were analyzed through the lens of development economics, seen as a vital source of external financing for developing countries, with theories emphasizing their role in poverty alleviation and income stabilization (Adhikari, 2018).

Aslam and Shah (2017) used a panel data approach across multiple developing countries to analyze the relationship between tax revenue and GDP growth. Their findings indicated that higher tax revenues improved public services and infrastructure, and excessive taxation hindered private investment, thus slowing economic growth. Conversely,

Ochieng and Ahmed (2019) employed a case study method focusing on sub-Saharan African countries and found that progressive tax systems contributed to income equality, indirectly fostering economic development. In Nepal, Shrestha and Singh (2017) utilized a time-series analysis to examine the impact of tax revenue on GDP growth. Their findings indicated that while tax reforms introduced post-2015 improved revenue collection, the high tax burden on businesses potentially discouraged private-sector investment. Similarly, Pandey (2019) utilized a regression analysis and found that indirect taxes, such as VAT, had a more significant positive effect on economic growth than direct taxes, and suggested that the contribution of taxation was highly influenced in Nepalese economic outcomes.

Chatterjee and Chakraborty (2018) used time-series analysis to examine the impact of government expenditure on economic growth in South Asian countries. Their results revealed that targeted government spending on education and health positively correlated with long-term economic growth. Similarly, Ali and Yusuf (2020) conducted a comparative analysis of government spending patterns in infrastructure and social welfare in Southeast Asia, concluding that investments significantly contributed to poverty reduction and economic development. Bhusal and Sapkota (2018) used a panel data approach to analyze the relationship between government expenditure and economic development in Nepal. Their study concluded that increased spending on infrastructure projects, post-earthquake, inspired economic recovery and growth.

Mwangi and Kimani (2016) employed a cross-sectional analysis to investigate the impact of foreign direct investment (FDI) on economic growth in East African countries. They found that FDI inflows significantly boost GDP growth by providing capital, technology, and managerial expertise. On the other hand, Awan and Ali (2019) used a mixed-method approach to explore the role of domestic investment in Pakistan, finding that domestic investments in the manufacturing and services sectors were critical for sustainable economic growth. Poudel and Dhungana (2020) employed a mixed-method approach, combining quantitative analysis with case studies, to investigate the impact of foreign direct investment (FDI) on Nepal's economic development. Their research highlighted that FDI inflows had a relatively low impact on sectors like hydropower and tourism. On the other hand, domestic investment, particularly in small and medium enterprises (SMEs), was hampered by a lack of access to finance and bureaucratic hurdles, as noted by Koirala (2016).

Ahmed and Zafar (2017) conducted a longitudinal study on remittances in South Asia, finding that remittances play a vital role in poverty alleviation and income stability. Their study utilized household surveys to analyze the socio-economic impact of remittances on recipient families. In contrast, Ratha et al. (2020) employed econometric modeling to assess the macroeconomic effect of remittances on economic growth in sub-Saharan Africa. Their findings indicated that while remittances contributed to immediate consumption and poverty reduction, their impact on long-term economic growth was contingent on the effective utilization of these funds in productive investments. Research by Adhikari (2018) used household survey data to examine the impact of remittances on poverty reduction and economic stability in Nepal. The study found that remittances were critical in improving household income and consumption levels, particularly in rural areas. However, Dahal and Sapkota (2021) pointed out that while remittances contributed to immediate economic relief, their long-term impact on sustainable development was limited due to the lack of productive investments in remittance-receiving households.

The literature concluded that taxation would have the foundation for economic growth if well-structured on the necessary public goods and services. Investments have been realized as essential for capital accumulation and technological advancement. Remittances, although found to be used for consumption, would have an impact on development if channeled into productive investments. The effectiveness of these factors depends on the governance structures and policy frameworks within these economies. Reviewing the previous literature, this study underscored that taxation, investment, and remittances have been central to Nepal's economic growth and development, providing a new gap in past analysis.

Research Methodology

Data and Its Sources

This study was based on empirical research to establish the relationship between economic development and fiscal and financial dynamics in Nepal, employing robust ordinary least square (OLS) after inspecting a two-stage Engle-Granger cointegration analysis regression model with 30 years annual series spanning from 1993 to 2022. This study was based on secondary data sources, collected via Nepal Rastra Bank (NRB) open database. The relationship between income tax, VAT, remittance, investment, and GDP was studied in this study. Descriptions of variables are presented in Table 1.

Table 1: Descriptions of Variables

Variables	Proxy	Measurements	Sources
GDP	Economic development	Rs. In million	NRB, 2022
REM	Remittance	Rs. In million	NRB, 2022
INV	Investment	Rs. In million	NRB, 2022
VAT	Value-Added Tax	Rs. In million	NRB, 2022
IT	Income Tax	Rs. In million	NRB, 2022

Model Specification of Data Analysis Tools

This study applied both descriptive and inferential tools to analyze data. Descriptive techniques were used to examine the fiscal and financial situation of the Nepalese economy. Similarly, an inferential technique was used to measure the relationship between the income tax, VAT, remittance, investment, and GDP, utilizing the time series data of the Nepalese economy by a two-step model. To construct long-run and short-run regression models, the variables were integrated of order one (i.e., they had a unit root and became stationary after first differencing), considering the residual unit root of the long-run regression at the first difference, proceeding as subsequently.

When variables were non-stationary at levels but became stationary after differencing a co-integration test was determined if a long-run relationship existed between them. If such a relation was found, the long-run regression model was formulated as:

$$GDP_t = \alpha_0 + \beta_1 IT_t + \beta_2 VAT_t + \beta_3 REM_t + \beta_4 INV_t + \epsilon_t \quad \ldots\ldots\ldots\ldots\ldots 1$$

Where GDP_t = Gross Domestic Product at time t, IT_t= Income Tax at time t, VAT_t = Value-Added Tax at time t, REM_t = Remittances at time t, INV_t = Investment at time t, and ϵ_t = Error term representing the long-run equilibrium residuals, and α_0, β_1, β_2, β_3, and β_4 = Long-run coefficients. The log transformation of (1) was as:

$$\log GDP_t = \alpha_0 + \beta_1 \log It_t + \beta_2 \log VAT_t + \beta_3 logREM_t + \beta_4 logINV_t + \epsilon_t \ldots\ldots\ldots (2)$$

The augmented Dickey-Fuller test (ADF) of the unit root for residual was employed to determine whether the long-run relationship or cointegration exists or not, allowing an error correction model (ECM)—called the Engel-Granger and the augmented Engel-Granger tests (Gujarati, et al., 2009) for short-run dynamics. The study, however, didn't find any evidence of cointegration between variables of interest. Thus, the study applied robust OLS techniques to avoid the sporous results based on the equation (3).

$$\Delta\log GDP_t = \alpha_0 + \beta_1 \Delta\log It_t + \beta_2 \Delta\log VAT_t + \beta_3 \Delta logREM_t + \Delta\beta_4 logINV_t + \epsilon_t \ldots (3)$$

Results and Discussion

Descriptive and Trend Analysis

This study started from the descriptive statistics of the variables of interest—GDP, IT, VAT, REM, and INV of the Nepalese economy, measured in millions of rupees from FY 1993 to 2022. The descriptive measure provided the nature of the time series in analysis to determine the trend and situation of the Nepalese economy in an eye short. The descriptive summary of the studied variables from FY 1993 to 2022 is in Table 2.

Table 2: Descriptive Summary of Gross Domestic Product, Income Tax, Value-Added Tax, Remittance, and Investment (FY 1993-2022) in Million Rupees

Descriptions	GDP	VAT	REM	INV	IT
Mean	1361259	68834.47	265888.5	333047.0	66145.70
Median	771742.5	27955.65	123419.5	165891.5	18436.90
Maximum	4105501	240121.3	853944.1	1164940.	361936.7
Minimum	171474.0	4007.700	223.0000	37278.00	1281.300
Std. Dev.	1243665	76165.90	296324.7	343722.5	93460.43
Skewness	0.959031	1.042611	0.749418	1.205069	1.806139
Kurtosis	2.590739	2.666046	2.030667	3.261412	5.495040
Jarque-Bera	4.808066	5.574595	3.982644	7.346377	24.09222
Probability	0.090353	0.061587	0.136515	0.025395	0.000006

Note. GDP = Gross Domestic Product, IT = Income Tax, VAT = Value-Added Tax, Rem. = Remittance, INV. = Investment, from Quarterly Bulletin of Nepal Rastra Bank (2022).

Table 2 reveals that the mean indicates the averages of all studied variables, while the median shows the mid-values during the study period. Similarly, the standard deviation depicts the dispersion from the mean values. Likewise, Skewness measures 0 for normal, while the maximum of 3 mirrors the Mesokurtik, and greater and less than 3 indicates Leptokurtic and Platokurtic respectively. Finally, Jarque-Bera test statistics measure the difference between Skewness and Kurtosis of these time series data with this form of normal distribution. The JB statistics are said to be normal if the probabilities are greater than 5%. Thus, GDP, VAT, and REM are normally distributed, while INV and IT are not normally distributed during the study period. Based on the trends of such macroeconomic data over the study period are depicted in Figure 1.

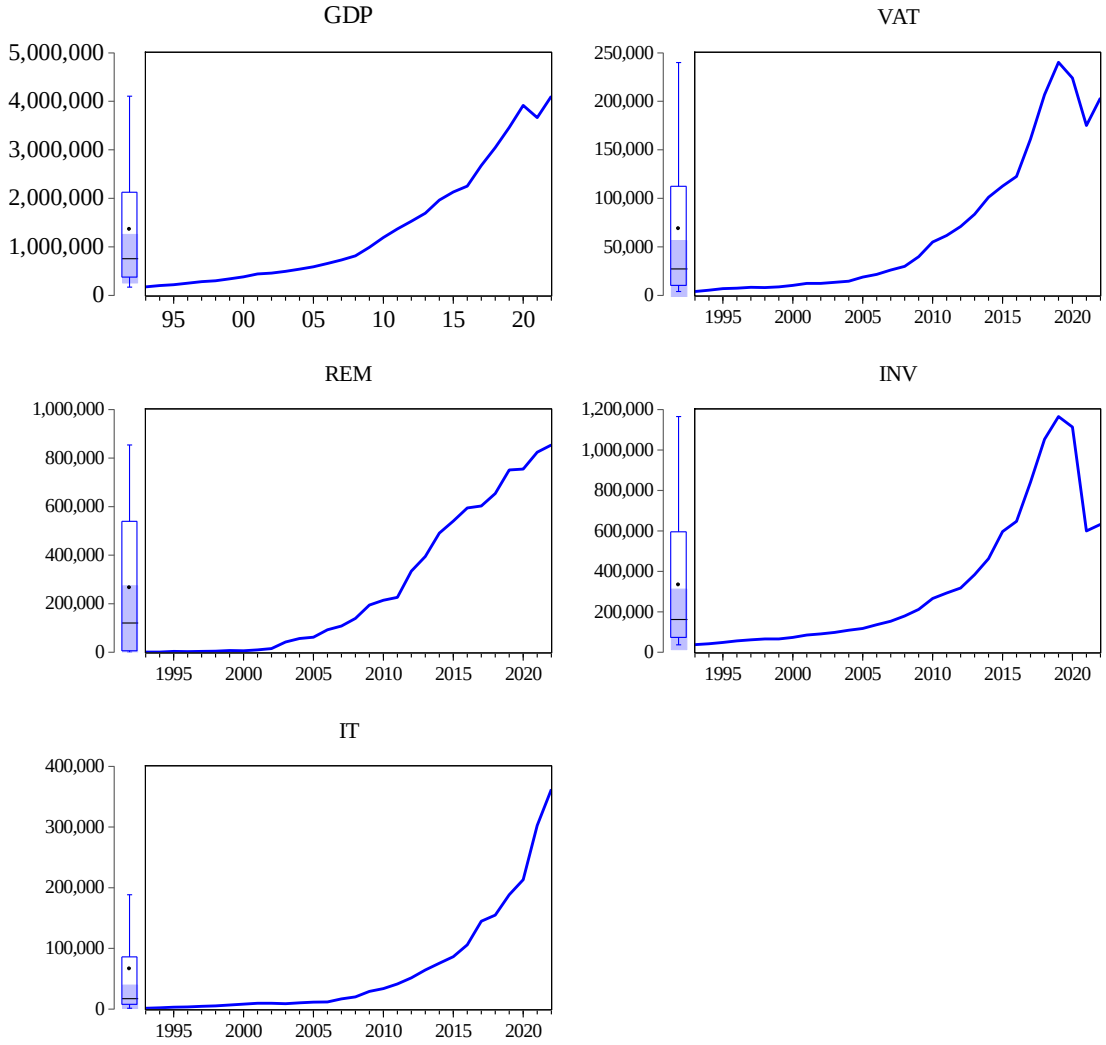

Figure 1: Macroeconomic Data

Figure 1 reveals that raw figures of the GDP, IT, VAT, REM, and INV, increased over the study period except in 2019/20 due to COVID-19. Later they were recovered. Among these variables, the country's economy has been highly dependent upon remittances, and income tax which have been increasing last two years. Similarly, investment and VAT were slugged in recent years. Furthermore, box plots were used to compare the mean and median through their thick lines and shadow areas, revealing that the mean G increased less than the median, indicating that the increase in GDP was a lower trend during the years. Likewise, with the others' elements, they were visualized as lower trends. In sum, all studied macroeconomic variables of the Nepalese economy performed worse performance during the study periods.

Unit Root Test of All Variables

Unit root tests of all variables were employed to determine whether this time series dataset was non-stationary and contained a unit root. This indicated that variables were affected by random shocks and tended to return to their mean over time, suggesting a lack of long-term trend or stability. ADF test of the unit root of all dependent and independent variables was utilized in this study, and the results were obtained in Table 3, underlying the hypothesis: H_0: The variable has a unit root.

Table 3: Augmented Dickey-Fuller Test of Unit Root

At Level with Constant			At First Difference with Constant		
Variables	t-test	p-value	t-test	p-value	Stationary
logGDP_t	-0.6253	0.8499	-4.8985	0.0005	I(1)
logIT_t	-6.6853	0.8352	-4.6852	0.0009	I(1)
Lnvat_t	-0.9954	0.7414	-3.837	0.007	I(1)
Lnrem_t	-1.8163	0. 3655	-8.6354	0.000	I(1)
Lninv_t	-1.1649	0.6756	-3.8116	0.0075	I(1)

Table 3 shows that the ADF test of the unit root of all dependent and independent variables was insignificant at level, they have unit root at level data, and all the series were stationary at first difference. Thus, the order of integration of variables is *I*(1), indicating regression at level data may lead to a spurious relationship.

Relationship wetween GDP and Fiscal and Financial Variables

The paper attempts to establish the relationship between GDP and intended fiscal and financial variables. The ordinary least square (OLS) estimation process is reported in Table 4.

Table 4: Relationship Between GDP and Fisal and Financial Variables

logGDP_t = 2.828 + 0.2902 logIT_t + 0.3236 logVAT_t + 0.0304 logREM_t + 0.0445 logINV_t

SE	= 0.1356	0.0440	0.1080	0.0119	0.0903
T-Stat.	= 20.846	6.593	2.983	2.545	0.492
P-value	= 0.000	0.000	0.006	0.0175	0.627

(R-squared = 0.99766, F-stat. = 2667.965 at p =0.000, and D-W = 0.9865)

The GDP_t estimation findings showed a mixed result in the first step model. The estimation showed that all variables have a positive relationship with GDP; however, only logIT_t, logVAT_t, and logREM_t significantly influenced the GDP in Nepal. The results show that income tax, value-added tax, and remittance may contribute to the productivity of Nepal thereby increasing GDP. On the flip side, the findings were found spurious, because of the R^2 standing at 0.997. Despite this, the F statistic was significant (F-stat. = 2667.965 at p =0.000), and the value of D-W (0.9865) was less than R^2, indicating a spurious for the estimation of GDP. To avoid spurious estimation, the paper has attempted to apply the residual stationarity test for cointegration to estimate the error correction model.

Test of Residual Based Cointegration Test

Engle-Granger two-stage cointegration test was applied to determine whether there was a long-run association between GDP and anticipated regressors or not. The residual series was exacted from the OLS estimations as estimated in Table 4 and testing for the null hypothesis is the residual has a unit root. The t-statistic of the residual ADF unit root test was -3.87403 and 5% critical is calculated when N = 5 and T = 30 as restated by MacKinnon (2010):

$$\text{Critical value} = \beta_\infty + \frac{\beta_1}{T} + \frac{\beta_2}{T^2} + \frac{\beta_3}{T^3}$$

$$= -4.71537 - \frac{17.3569}{30} - \frac{22.660}{30^2} + \frac{91.359}{30^3} = -5.31574$$

Now, the absolute value of the computed t-statistic is less than the absolute value of 5% critical value, indicating the null hypothesis is accepted, implying no long-run relationship or cointegration between variables of interest. The error correction mechanism thus cannot be allowed in this study. The paper, therefore, has applied the robust OLS model to estimate the relationship between GDP and fiscal and financial variables with stationary series by differencing each. Additionally, this estimation may help to minimize the spurious results in OLS.

Robust Estimation of Relationship between GDP and Fiscal and Financial Variables

Considering the first OLS results, the study applied another OLS regression with stationary series, allowing robust and non-spurious estimations. The results are presented in Table 5. The estimated OLS results are statistically fitted and well-estimated. Approximately 70% variation in GDP was explained by the regressors as indicated by R^2. Furthermore, the significant F-statistic revealed that the overall estimation was fitted and robust. On the flip side, DW

statistic (1.974572) was approximately 2, implying the model was free from autocorrelation. The overall results thus confirm that the OLS estimation is statistically robust.

Table 5: Robust Relationship Between GDP and Fisal and Financial Variables

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Δlog*INV*	0.139415	0.063974	2.179251	0.0394
Δlog*IT*	0.055306	0.055869	0.989925	0.3321
Δlog*REM*	-0.014885	0.010269	-1.449490	0.1601
Δlog*VAT*	0.174467	0.082716	2.109229	0.0455
C	0.028349	0.005355	5.294170	0.0000
R-squared	0.700781	Akaike info criterion		-5.748104
Adjusted R-squared	0.650911	Schwarz criterion		-5.512363
S.E. of regression	0.012641	Hannan-Quinn criteria		-5.674273
Log likelihood	88.34750	Durbin-Watson statistic		1.974572
F-statistic	14.05219	Prob(F-statistic)		0.000005

The OLS results of Table 5 revealed that only investment (INV) and VAT significantly influenced economic development (GDP) at a 5% level of significance in Nepal. Moreover, the OLS result indicated that a 1% increase in investment and VAT rose the GDP by 0.139415% and 0.174467% respectively. It is observed that investment is the main source of human and physical capital formation which enhances productivity, innovation, and technical progress thereby improving the GDP of the nation, which was similar to the previous studies (Dangal & Gajurel, 2022; Dangal et al., 2022; Milbourne et al., 2003). On the other hand, VAT is the major source of revenue for the government as found in previous studies (Simionescu & Albu, 2016; Zhuravleva et al., 2020); and through domestic resource mobilization, GDP can be increased. Thus, this study concludes that the value-added tax and investment are vital for the growth of Nepal. While, on the other hand, income tax and remittances are insignificant, indicating that these fiscal and financial sources of Nepal's income are used for otherwise purposes rather than channeling for GDP growth. However, with remittance and income tax, the VAT and investment may enhance productivity and thus might be vital for Nepal's development.

The Coefficient and Residual Diagnostic and Stability Test of the Model

Diagnostic and stability tests are essential to ensure the robust results of OLS and avoid econometric problems. The coefficient and residual diagnostic test results are demonstrated in Table 5.

Table 6: Diagnostic Test of OLS Results

Diagnostic test	Test statistic	p-value
Heteroskedasticity	2.520474	0.6410
Serial Correlation	0.526420	0.7686
Normality	1.171356	0.556728
Functional Form	0.784772	0.3849

The results of Table 5 reveal that the null hypothesis of the Breusch-Pagan-Godfrey heteroskedasticity test, the Breusch-Godfrey serial correlation LM test, the Ramsey RESET test, and the normality test (Jarque-Bera) is accepted. Thus, the model is free from heteroskedasticity, serial correlation, and functional form misspecification, and residual or series is normally distributed. The COSUM and CUSUM-squared were performed for stability of the model, and the result is presented in Figure 2. The plot of CUSUM and CUSUM of square lies between 95% confidence interval, implying the OLS model is stable and well-fitted.

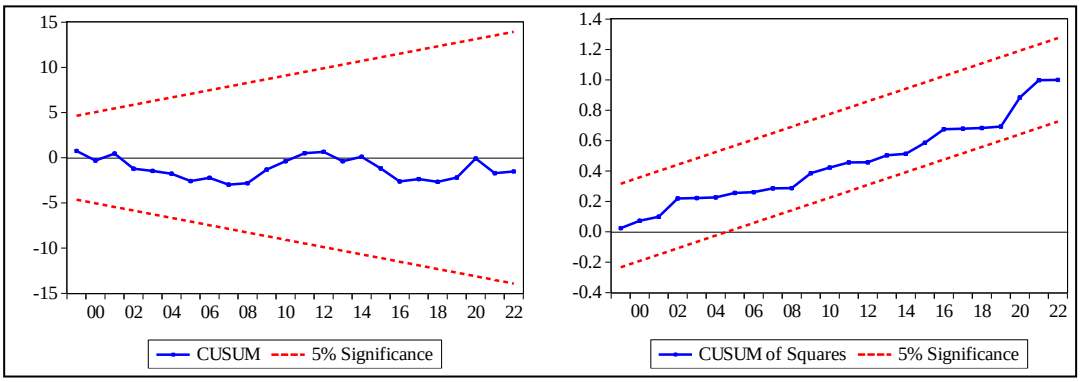

Figure 2: Plot of CUSUM and CUSUM of Square

Conclusion

Employing OLS techniques, the study concludes that value-added tax (VAT)—fiscal elements, and investment as financial elements are essential drivers of GDP growth in Nepal. Conversely, income tax and remittances show limited influence in the robust model, suggesting these resources might not be effectively utilized for immediate economic growth. The findings highlight the need for a more strategic allocation of income tax revenues and remittances to maximize their impact on GDP. This study, thus, suggested that the fiscal policy should be strengthened to better utilize income tax and remittance inflows for productive investments that contribute to GDP growth. Similarly, an investment-friendly environment should be promoted to investment to sustain long-term economic growth. Finally, monitoring and evaluation should be regularized to assess the effectiveness of VAT and investment policies to ensure they continue to drive economic growth and address any emerging challenges. These actions could enhance Nepal's economic resilience and growth trajectory.

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