

The Role of Remittances in Building Economic Resilience in Nepal: A Keynesian Analysis

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Abstract. This study uses a Keynesian framework to investigate the impact of remittances on Nepal's economic resilience. Employing secondary data from reliable government sources spanning the period 2000/01 to 2018/19, the research examines the relationship between remittances and key macroeconomic variables, including consumption, investment, imports, and Gross National Product (GNP). The study reveals a significant increase in remittances over the years, accompanied by growth in GNP, private consumption, government expenditure, imports, and disposable income. Using multiplier analysis, the study finds that a one-unit increase in remittances leads to a 0.89 unit increase in consumption, a 1.25 unit increase in imports, a 0.32 unit increase in investment, and a 2.14 unit increase in GNP. Multiple regression analysis confirms the positive and significant relationships between remittances and consumption, imports, and GNP. The findings underscore the crucial role of remittances in Nepal's economy and the potential for harnessing these inflows for sustainable economic development. However, the study also highlights the need for policymakers to recognize that while remittances provide short-term benefits, they should not be relied upon as a long-term solution for the country's economic challenges. The study contributes to the existing literature by comprehensively analyzing remittances' impact on Nepal's economy and offering valuable insights for policy formulation and future research.

Keywords: Consumption, Disposable income, Economic growth, Investment, Multiplier effects

1. Introduction

Remittances are typically cross-border person-to-person transfers that serve as a vital lifeline for many households around the world ([Ardic & Natarajan, 2021](#)). These cash inflows helped households move from poverty to more secure economic situations, reducing their vulnerability. The decision to migrate, which encompasses three distinct phases: pre-departure, stay at the destination, and return and reintegration, is significantly influenced by the saving and investment capabilities of migrants and recipient households ([Dhakal & Maharjan, 2018](#)). Often, a lack of local employment opportunities compels individuals to migrate, leaving basic needs such as food, education, and healthcare unmet ([Maharjan, 2010](#)). Some migrants also embarked on this journey to capital formation ([Maharjan et al., 2015](#)).

Migrants navigate several stages, including acquiring travel documents, securing employment contracts, and undergoing pre-departure training, incurring associated costs that lead to remittance earnings and savings. After these initial processes, migrants must manage various aspects of their finances, including living expenses and remittance allocations. Funds could be sent back to their home countries through wire-based or bank-based remittance services. Nepal heavily relied on remittances, significantly impacting the lifestyles of impoverished individuals and those with modest incomes ([Buch & Kucluleru, 2004](#)). The volume of remittances serves as a primary economic indicator of the country's performance.

The Nepalese economy faces several specific challenges, such as poverty, limited employment opportunities, and stability in the balance of payments ([Bhatta, 2013](#); [Maharjan, 2010](#)). Remittances play a crucial role in addressing these challenges by significantly contributing to Gross National Product (GNP) growth and acting as a financial buffer during economic crises ([Ojha, 2019](#)). However, despite their importance, research on the utilization of foreign remittances remains limited ([Tchantchane et al., 2013](#)). Existing research often reveals that most remittance income is directed towards consumption rather than business investments. However, this allocation varies across regions and demographics ([Barajas et al., 2009](#)). For instance, some studies suggest that remittances are primarily spent on status-oriented goods, while others indicate investments in housing, land, and ornaments, which may not always benefit the economy. A subset of returned migrants engages in business enterprises, which varies across countries and regions ([Ustubici & Irdam, 2011](#); [Karki et al., 2023](#)).

Despite the economic challenges faced by migrant host countries, remittances provide a significant source of foreign currency, contributing to the balance of payment stability and GNP growth. Additionally, remittances are a crucial financial support system for migrants' families and friends during economic hardship in their home countries. These financial inflows directly impact recipient households' income, but their influence extends beyond the individual level. As macroeconomic variables are found to be cointegrated in the long run ([Karki, 2018](#)), remittances have indirect multiplier effects on poverty, welfare, and credit constraints, which impact economic resilience. In some contexts, remittances finance education, healthcare, and increased investment, all contributing positively to economic growth. Remittances can ease credit constraints and compensate for financial system limitations in countries where banks exhibit lower liquidity ratios ([Karki, 2021](#)). However, an outflow of workers, particularly skilled workers, can hinder growth in the countries of origin, though Nepal has a large number of unskilled workers compared to skilled workers ([Rajbhandari et al., 2020](#)). Despite the challenges faced by migrants abroad, including reduced wages and challenging working conditions, many choose to remain rather than return home, often driven by substantial debts and limited employment opportunities in Nepal. Officially recorded remittances worldwide reached a record-breaking \$529 billion in 2018, estimated to rise to \$550 billion in 2019. Nepalese migrant workers remitted \$8.1 billion in 2018, making remittances the 19th largest source of funds sent by global migrants. Despite a decline in the number of Nepalese migrant departures, remittances continued to increase by 16.39 percent year-on-year, demonstrating their critical role in Nepal's economy. In 2018, Nepal ranked among the top five recipients of remittances in terms of GDP.

Notwithstanding the critical importance of remittances to the Nepalese economy, there is a lack of comprehensive research on their utilization and impact. This study aims to bridge this gap by focusing on four key macroeconomic variables: consumption, investment, imports, and GNP. The steady increase in remittance inflows over the last decade highlights the Nepalese economy's growing reliance on them. In the past ten months alone, remittances surged from Rs. 529 billion in 2017/18 to Rs. 550 billion in 2019, as reported by the Ministry of Finance. Additionally, the data from the World Bank revealed that inflows of remittances to Nepal totaled USD 8,064 million in 2018, ranking it 19th globally in terms of remittance receipts. According to the Central Intelligence Agency, Nepal's heavy dependence on remittances is evident as they accounted for 30 percent of GDP in 2018. Macroeconomic studies emphasize that migrants continue to provide a crucial source of foreign currency, supporting the balance of payments and contributing to GNP growth despite their host countries' economic challenges.

Additionally, remittances tend to be sent during times of financial crisis in migrants' home countries, providing essential support to their families and minimizing foreign exchange losses due to macroeconomic shocks, emphasizing the need to adapt new technology and innovation ([Dahal et al., 2020](#)). Leveraging the Keynesian Model as an analytical framework, this research seeks to answer three key research questions. First, how do remittances contribute to economic growth in Nepal? Second, to what extent do remittances impact macroeconomic variables in Nepal? Finally, can remittances be harnessed for productive sectors in Nepal? In this regard, the primary objective of this research is to explore the effect of remittances on macroeconomic variables in the Nepalese economy, focusing on consumption, investment, imports, and national income. Additionally, the study aims to determine the multiplier effect of remittances on these variables and propose effective policy measures to optimize their productive utilization. Through adequate analysis and empirical investigation, this study aims to contribute valuable insights into the role of remittances in building economic resilience and shed light on their multifaceted impacts.

The subsequent sections of this research are organized to address these objectives and assumptions: Section 2 provides context by reviewing relevant literature, Section 3 explains the research methods with a focus on the empirical approach, Section 4 outlines the results and discusses their implications, and finally, Section 5 concludes the study.

2. Literature Review

Nepal's history of international labor migration spans two centuries, with migrants initially venturing abroad for various reasons, including military service and economic opportunities ([Bhatta, 2013](#)). However, in recent decades, driven by economic and non-economic factors, a growing number of Nepalese youths began migrating annually for foreign employment due to globalization and liberalization ([Bhatta, 2013](#); [Dahal et al., 2023](#)). [Ojha \(2019\)](#) emphasized that total remittance inflow significantly affects Nepal's economic growth. Factors such as capital formation, broad money supply, foreign aid, and demand for imported goods also positively affected Nepal's per capita income and GDP. [Uematsu et al. \(2016\)](#) estimated that remittances primarily influenced economic growth by increasing savings, thereby contributing to higher levels of investment. These remittances are regarded as part of complemented national and foreign savings, increasing the total amount of money available for investment. [Cynthia et al. \(2015\)](#) and [Karki et al. \(2021\)](#) argued that the scarcity of credit, especially for seed and working capital, had hindered private sector growth in Nepal. Pooled remittances provided a potential source of credit, supporting enterprise growth, although the majority of people believe it is challenging to obtain a retail loan in Nepalese banking ([Bhandari et al., 2021](#)). Many Nepalese migrants expressed a desire to invest in domestic enterprises, reducing poverty and generating employment and income, particularly in small and medium-sized enterprises.

[Salahuddin and Gow \(2015\)](#) revealed that officially recorded remittances often fell short of the actual amounts transferred through official and unofficial channels, with informal channels potentially adding up to 50 percent to globally recorded flows. [Datta and Sarkar \(2014\)](#) found that migrants were

primarily interested in financial and economic self-regard when transferring remittances to their home country. Successful migrants often saved abroad and invested part of their assets in their country, such as purchasing properties and financial assets. Although riskier, these investments often offered higher returns than assets in host countries. Tchantchane et al. (2013) emphasized that the growth-enhancing influence of remittances depended on the receiver country's business climate. A favorable environment, including financial development and robust institutions, could amplify the positive effect of remittances on investment and growth. Shera and Meyer (2013) highlighted that remittances significantly reduced poverty, especially in impoverished countries. Stronger outcomes were observed when remittances exceeded 5 percent of GDP. Javid (2012) pointed out that the impact of migration on economic growth varied based on the migrant's skill level, labor market conditions, and productivity. Unskilled workers or those in areas with labor market slack often yielded limited growth effects.

Ustubici and Irdam (2011) suggested that remittance inflows could be hindered by the home country's economic policies and institutional factors, such as exchange rate restrictions and macroeconomic instability like high inflation. According to Anjum et al. (2011), there is a positive correlation between real GDP, workers' remittances, private investment, and overall consumption in Pakistan. Higher remittances are linked to faster economic growth, which is elevated private investment. Abdullaev (2011) demonstrated that remittance transfers positively impacted per capita income growth, with a doubling of remittances resulting in a significant increase in growth. Siddique et al. (2010) discovered various causality patterns among nations, with Bangladesh having a one-way causal relationship from remittances to economic growth, India having no causal relationship, and Sri Lanka having a two-way causal relationship. Mallick (2008) highlighted the positive influence of remittances on private consumption, indicating that they consistently contributed to increased consumer spending. Trako (2008) pointed out the potential of remittances to stimulate small business establishment and self-employment among returning migrants and their home communities, emphasizing the need for government incentives to encourage such investments.

Diaz (2007) concluded that remittances influenced growth indirectly through investment, with a significant positive relationship between remittances and investment. Kireyev (2006) emphasized the complex relationship between macroeconomic variables and remittances. He asserted that remittances stimulated the private sector and overall growth but had minimal negative spillovers in economies with high propensities for investment and import. Glytosis (2005) found that countries in the sample demonstrated uniform adjustments of consumption habits, with an almost identical marginal propensity to consume ratio. Buch and Kucluleru (2004) proposed a family-centric perspective of remittances, where implicit contracts among family members, including migrants and those at home, played a vital role in remittance. Nishat and Bilgarmi (1991) employed the Keynesian macroeconomic model to assess worker remittances' impact on Pakistan's economy. Their study demonstrated a substantial positive influence on GNP, with an increase in remittances corresponding to a significant increase in GNP, indicating positive impacts on consumption, investment, and imports.

Tuladhar et al. (2014) highlighted how high remittance inflows induced Dutch disease effects in Nepal, leading to real effective exchange rate appreciation and a shift in focus from the tradable to non-tradable sector. Remittances also created a cycle of policy complacency. The study emphasized the significant impact of remittances on both micro and macro levels of Nepal's economy, contributing to development goals like poverty reduction, exchange rate appreciation, and policy complacency. Dhakal and Phuyal (2012) underscored the importance of the 'remittance economy' in Nepal, highlighting its role as a source of foreign exchange and income for households and communities, particularly in the hill areas. Pant (2008) argued that remittances, whether channeled into consumption, housing, or other investments, invariably stimulated demand for goods and services, positively impacting the economy. Further, this industry has emerged as a significant source of revenue in a competitive free market environment characterized by the participation of both public and private entities (Bhandari et al., 2021).

The reviewed literature emphasized the significant impact of remittances on economic growth in

Nepal. However, it also highlights several limitations and inconsistencies in previous studies. While some researchers emphasize the positive effects of remittances on GDP growth and investment (Ojha, 2019; Uematsu et al., 2016), others point out challenges such as the scarcity of credit and institutional barriers hindering private sector growth (Cynthia et al., 2015; Karki et al., 2021). Moreover, evidence suggests that officially recorded remittances may underestimate the amounts transferred, with informal channels playing a significant role in remittance flows (Salahuddin & Gow, 2015). Additionally, the literature reveals the complex relationship between remittances and economic variables, with studies highlighting varying causal patterns among nations (Siddique et al., 2010). Despite the contributions of the existing literature, more recent studies are needed to focus on the Nepalese context and address these limitations and inconsistencies. The impact of remittances, which include stimulating investment, alleviating poverty, and shaping policy dynamics, is contingent upon factors such as economic policies, institutional environments, and the utilization patterns of migrant-sent funds. Based on the literature, the model depicted in Figure 1 has been developed.

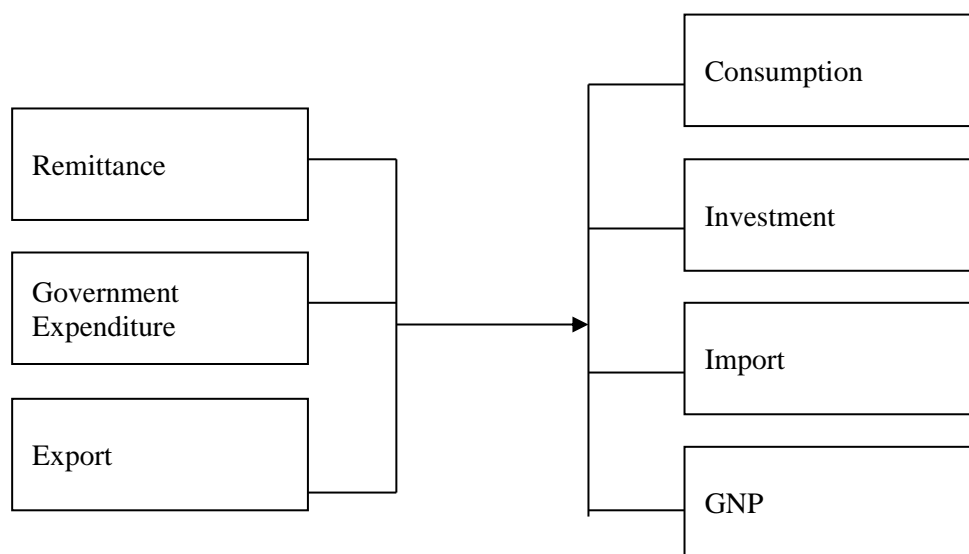


Fig.1 : Theoretical Framework of the Study

Source: Authors

2.1 Specification of variables

The study explores the relationships between remittances and various economic variables to better understand the dynamics of Nepal's economy. *Independent variables:* The study starts by considering the independent variables, each of which plays a key role in shaping economic growth.

Remittance: A cornerstone of this study, remittances constitute the primary independent variable. As defined by Tchantchane et al. (2013), remittances represent the transfer of money by migrant workers to individuals in their home country. These financial inflows have become a significant component of international capital flows, particularly for labor-exporting nations. Moreover, remittances have garnered increasing prominence in the economies of several countries. Their contribution extends to the livelihoods and economic growth of the receiving nations (Buch & Kucluleru, 2004). In some instances, remittances account for as much as one-third of a country's GDP. Beyond this, they play a crucial role in fostering financial development (Shera & Meyer, 2013) and contribute to mitigating consumption instability in developing countries (Dhakal & Phuyal, 2012).

Government Expenditure: Government expenditure, another independent variable, encompasses funds allocated to various sectors to meet the current demands and needs of a nation's citizens, ranging from healthcare and social services to education and justice. This allocation stimulates aggregate demand and promotes economic circulation within the country. Government expenditure

holds the potential to reduce economic disparities within a nation, contingent on the effectiveness of the policy in place. Notably, the past half-century has witnessed a stark rise in income inequality globally. Effective government expenditure policies can bridge the gap between the rich and poor ([OECD, 2016](#)).

Export: Export, the third independent variable, represents the goods and services produced within a country's borders and subsequently sold to foreign nations. This economic activity aims to secure a competitive advantage, indicating that the country's product is manufactured with superior efficiency compared to others. For any nation, crafting policies that facilitate a conducive environment for product export is of paramount importance. Not only do exports bolster foreign exchange reserves, allowing countries to manage their currency values competitively, but they also stimulate economic growth by expanding market reach.

Dependent variable: Dependent variables are those that are going to be impacted by an independent variable.

Consumption: Consumption, a crucial dependent variable, denotes an individual's ultimate acquisition of recently produced products and services for immediate use. According to [Maharjan et al. \(2022\)](#), People's consumption behaviors are influenced by their level of education, knowledge, and understanding. According to the renowned economist Keynes, the consumption function illustrates the relationship between disposable income and consumption. It is crucial in both macroeconomics and microeconomics. On a macroeconomic scale, studying aggregate consumption aids in determining aggregate saving, a powerful determinant of an economy's long-term productive capacity. It also offers insights into national output and macroeconomic fluctuations.

H₁: There is a significant relationship between remittance and consumption.

Investment: Investment, a vital dependent variable, represents the acquisition of assets not consumed immediately but used in the future to generate wealth. It has been widely demonstrated that sound investments in businesses can stimulate economic growth. When companies invest in production equipment to increase output, the nation's gross domestic product rises, propelling economic growth. Interestingly, studies indicate that households receiving remittances tend to save and invest more than those without such inflows and that during this process, individual sentiments have the greatest influence on investment decision-making ([Karki, 2017](#)). Furthermore, remittance-induced expenditures have a high multiplier effect, positively impacting investment ([Lucas, 2005](#)).

H₂: There is a significant relationship between remittance and investment.

Imports: Imports, the second dependent variable, signify foreign goods and services procured by a nation's residents. Imports are essential as they allow a country to access products or services that are scarce, unavailable domestically, or offered at a high cost or low quality. They address the needs of a nation's market with products from abroad ([Raj et al., 2022](#)). The balance between imports and exports influences a country's trade balance, leading to trade deficits or surpluses, consequent effects on debt levels and the economy's overall stability.

H₃: There is a significant relationship between remittance and imports.

National Income: National Income embodies the monetary value of all commodities and services generated within its boundaries over a given time frame, usually a year. It serves as a pivotal macroeconomic variable, reflecting a nation's financial health and economic standing. National income profoundly influences aggregate demand for goods and services, which, in turn, shapes an economy's overall performance and its distribution.

H₄: There is a significant relationship between remittance and GNP.

3. Research Method

This study employs a descriptive and causal-comparative research design. It draws on secondary data from trustworthy sources such as the Nepal Rastra Bank, World Bank, Central Bureau of Statistics (CBS), and the Ministry of Finance.

A wide range of statistical tools and models were used to analyze the dynamics of remittance

utilization and its impact on various macroeconomic variables. Descriptive statistics were critical in determining the central tendencies and variances among the variables under consideration, allowing for the calculation of means and standard deviations. Linear regression analyses were used methodically to examine the impact of remittances on macroeconomic factors. This aided in determining remittance multipliers, providing insight into the significant impact remittances have on the economic context. The significance of the correlations between remittance and the selected macroeconomic factors of interest was examined further using multiple regression analysis. The Variance Inflation Factor (VIF) test statistics were carefully employed to evaluate the effect of multicollinearity on the regression models, confirming the findings' integrity. Furthermore, the presence of autocorrelation in the regression model was closely evaluated, further enhancing the reliability of the regression analysis.

Population and sample size: The study included macroeconomic data over a longer period, encompassing 19 years of economic activity in Nepal spanning from 2000/01 to 2018/19. The rationale behind selecting a pre-COVID data period stems from the motive to mitigate potential disruptions and structural breaks in the dataset. The study's exclusion of the COVID-19 pandemic period ensures analysis of more stable economic conditions and remittance trends, enabling a clearer understanding of long-term patterns. Covering two decades of data provides a robust sample size for trend identification. By focusing on pre-COVID data, the study establishes a baseline understanding of remittance dynamics, which is crucial for future research and policy development. The data instrumentation was based on the widely used macro-Keynesian econometric model, which provided a systematic framework for the research investigation.

Reliability and validity: Appropriate measures were taken to confirm the validity and reliability of this study. The data used were obtained from authoritative reports and publications issued by government bodies with stringent quality control processes. Consultative discussions with professionals and dedicated experts enhanced this research's general reliability and validity throughout the research process, ensuring that its findings hold practical and academic merit.

Nishat and Bilgrami's (1991) seminal study serves as the foundational work upon which the methodical framework of this research is constructed. Their model, based on the standard Keynesian framework, provides a solid foundation for approximating the dynamics of the Nepalese economy. The model is summarized as follows:

$$CON_t = C_0 + C_1 YD_t + e_{ct} \quad (1)$$

$$INV_t = i_0 + i_1 GNP_t + e_{it} \quad (2)$$

$$IMP_t = m_0 + m_1 GNP_t + e_{mt} \quad (3)$$

$$TAX_t = t_0 + t_1 GNP_t + e_{tt} \quad (4)$$

$$YD_t = GNP_t - TAX_t \quad (5)$$

$$GNP_t = CON_t + INV_t + GEX_t + EXP_t + REM_t - IMP_t \quad (6)$$

On the left side of the equations, there are six endogenous variables: private consumption (CON_t), investment (INV_t), imports (IMP_t), tax revenue (TAX_t), disposable income (YD_t), and national income (GNP_t). Furthermore, the model takes into account three exogenous variables: remittances (REM_t), government spending (GEX_t), and exports (EXP_t).

It follows economic theory by depicting a positive link between private investment and income, governed by the size of i_1 . Similarly, Equation (3) shows that the value of imports (IMP_t) is positively related to income, with m_1 being the marginal propensity to import. Taxation is established as a function of income in Equation (4), with t_1 denoting the tax rate. The parameters c_0 , i_0 , m_0 , and t_0 determine the autonomous components of consumption, investments, imports, and taxes, respectively. The random disturbances in the model are denoted by the terms e_{it} , e_{mt} , e_{ct} , and e_{tt} , which reflect the unexplained factors of private investment, imports, consumption, and taxes, respectively. In Equation (5), disposable income is computed as income less taxes. Equation (6) emphasizes the identity that the worth of revenue

created inside the economy equals the sum of government spending, private consumption and investment, exports and remittances, and remittances minus imports.

The reduced form equations (7) through (10) derive from solving the model and provide the link between endogenous variables and exogenous factors while accounting for stochastic disturbances. These equations allow us to assess the impact of exogenous variables, such as remittances, exports, and government expenditure, on private consumption, private investment, imports, and overall national income.

$$\text{CON}_t = \alpha_0 + \alpha_1 \text{REM}_t + \alpha_2 \text{EXP}_t + \alpha_3 \text{GEX}_t + e_{it} \quad (7)$$

$$\text{INV}_t = \beta_0 + \beta_1 \text{REM}_t + \beta_2 \text{EXP}_t + \beta_3 \text{GEX}_t + e_{it} \quad (8)$$

$$\text{IMP}_t = \gamma_0 + \gamma_1 \text{REM}_t + \gamma_2 \text{EXP}_t + \gamma_3 \text{GEX}_t + e_{it} \quad (9)$$

$$\text{GNP}_t = \delta_0 + \delta_1 \text{REM}_t + \delta_2 \text{EXP}_t + \delta_3 \text{GEX}_t + e_{it} \quad (10)$$

In particular, the coefficient of remittances in Equation (7) plays a pivotal role. It serves as a measure of the remittance multiplier, allowing us to quantify the effect of a variation in remittances on output in Nepalese rupees. This multiplier captures the dynamics of remittances within the broader economic landscape and forms a cornerstone of this research's analytical framework.

4. Results and Discussions

Several statistical techniques, including descriptive analysis, correlation, linear regression, and multiple regression, were employed to investigate the impact of remittances on imports, investment, consumption, and national income. The multiplier effect of remittance was calculated using the coefficient on remittances in the output equation.

Table 1. Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
REM	9798.00	944531.28	326675.24	291550.70
GEX	35785.00	399992.00	150418.21	112936.75
EXP	77280.00	313404.00	153942.15	75161.81
PVTCON	364641.00	2298747.00	1089515.47	640634.31
INV	93019.00	2157178.00	542383.16	592241.76
IMP	130912.00	1761253.00	563091.47	471000.92
GNP	443220.00	3506731.00	1435604.63	950077.00

Table 1 summarizes the statistical characteristics of the key variables analyzed in this study. It's worth noting the wide range of values observed within each variable, which offers insight into the significant variations in these economic factors over the years. Regarding remittances, it is clear that the recorded statistics range from a low of 9,798 to a high of 944,531. This vast range of variation shows the dynamic nature of remittance flows, with migrant workers' contributions to the economies of their home nations varying significantly. This may be related to the study conducted by [Bhattarai et al. \(2020\)](#), which discovered a negative correlation between employees' psychological contracts and their professional commitment for a variety of reasons. The average remittance value of 32,667.24, along with a standard deviation of 291,550.70, highlights the significant volatility in these vital financial inflows.

4.1 Correlation Analysis

This study's correlation analysis provides important insights into the relationships between remittances and various macroeconomic indicators in the context of Nepal (see Table 2).

Table 2. Pearson Correlation

	REM	GEX	EXP	PVTCON	INV	IMP	GNP
REM	1	.985**	.979**	.992**	.935**	.972**	.988**
GEX		1	.974**	.989**	.966**	.991**	.998**
EXP			1	.971**	.949**	.972**	.978**
PVTCON				1	.923**	.968**	.993**
INV					1	.987**	.961**
IMP						1	.990**
GNP							1

.**Correlation is significant at 0.01 level (2-tailed), Cronbach's Alpha 0.9252 and P-value 0.000

The analysis, first and foremost, demonstrates a strong and positive association between remittances and private consumption ($r = 0.992$). This means that as remittance inflows increase, private consumption in Nepal tends to rise dramatically as well. This finding is consistent with previous research by [Lucas \(2005\)](#), which found that remittance-receiving households save and invest more, hence increasing consumption. This discovery has far-reaching consequences for Nepalese households' well-being, as remittances play a critical role in increasing their purchasing power and improving their quality of life. Second, there is a positive association ($r = 0.935$) between remittances and investment. This means that greater remittance levels correspond to increased investment activity in Nepal. This finding backs up [Lucas's \(2005\)](#) research, which found a strong multiplier effect of remittance-induced expenses leading to additional investment. The inference here is that remittances not only assist households but also help to strengthen the nation's economy by encouraging investment, which can lead to economic growth.

Third, the results documented a favorable relationship between remittances and imports ($r = 0.972$). Imports of foreign goods and services rise in tandem with remittances. This finding backs up previous research by [Tuladhar et al. \(2014\)](#), who found that remittances contribute to real effective exchange rate appreciation, enhancing the competitiveness of Nepalese imports. This study suggests that remittances may influence consumption patterns by allowing access to a broader range of foreign products, affecting domestic businesses and trade balances. Finally, a positive association ($r = 0.988$) between remittances and GNP is found. This suggests that remittances substantially impact Nepal's overall economic output. This finding is consistent with [Abdullaev's \(2011\)](#) research, which found that remittance transfers favorably influence per capita income growth. The implication is that remittances can drive Nepal's economic progress, helping the country prosper.

4.2 Linear Regression Analysis

The proposed model subjected to linear regression is

$$CON_t = C_0 + C_1 YD_t + e_{ct} \quad (1)$$

$$INV_t = i_0 + i_1 GNP_t + e_{it} \quad (2)$$

$$IMP_t = m_0 + m_1 GNP_t + e_{mt} \quad (3)$$

$$TAX_t = t_0 + t_1 GNP_t + e_{tt} \quad (4)$$

Table 1. Linear Regression Estimation of Coefficients

Model		Unstandardized Coefficients		Std. Coefficients	T	Sig.
Dep. V.	Indep. V.	B	Std. Error	Beta		
PVTCON	(Constant)	174785.988	27657.099		6.320	0.000
(1)	YD	0.500	0.013	0.995	39.960	0.000

INV	(Constant)	-317325.561	71689.714		-4.426	0.000
(2)	GNP	0.599	0.042	0.961	14.265	0.000
IMP	(Constant)	-141188.996	29573.237		-4.774	0.000
(3)	GNP	0.491	0.017	0.990	28.328	0.000
TAX	(Constant)	-62288.570	11177.085		-5.573	0.000
(4)	GNP	0.151	0.007	0.984	23.065	0.000

Table 3 presents the linear regression estimation of coefficients, illustrating the relationships between various economic variables. The results show:

Disposable Income and Private Consumption: Disposable income has a significantly positive impact on private consumption (0.500, $p < 0.05$). This implies that as disposable income increases, private consumption also increases. This finding aligns with the idea that higher income leads to increased spending on consumption goods. This result supports previous research (Datta & Sarkar, 2014), indicating that migrants tend to invest part of their assets in their home country, potentially increasing consumption.

Gross National Product (GNP) and Investment: GNP also has a positive and significant impact on investment (0.599, $p < 0.05$). This implies that as the national income (GNP) grows, investment increases. This aligns with the notion that a growing economy attracts more investment. This result supports prior studies (Javid, 2012) highlighting the connection between economic growth and investment.

GNP and Imports: GNP similarly has a significantly positive impact on imports (0.491, $p < 0.05$). As the national income (GNP) rises, the demand for imports also increases. This finding suggests that a growing economy tends to rely more on imported goods. This result supports prior research (Siddique et al., 2010) showing varying causality patterns across countries.

GNP and Tax Revenue: GNP has a positive but less significant effect on tax revenue (0.151, $p < 0.05$). This indicates that as the national income grows, tax revenue increases, but the effect is not as pronounced. This result supports the idea that economic growth can lead to increased tax revenue, but other factors may also influence taxation levels.

Table 4. Linear Regression Model Fitness (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
PVTCON (1)	Regression	7.31x10 ¹²	1	7.31x10 ¹²	1596.839	0.000
	Residual	7.78x10 ¹⁰	17	4.58x10 ⁹		
	Total	7.39 x10 ¹²	18			
INV (2)	Regression	5.82 x10 ¹²	1	5.82x10 ¹²	203.480	0.000
	Residual	4.87 x10 ¹¹	17	2.863x10 ¹⁰		
	Total	6.31 x10 ¹²	18			
IMP (3)	Regression	3.91 x10 ¹²	1	3.91x10 ¹²	802.465	0.000
	Residual	8.28 x10 ¹⁰	17	4.87x10 ⁹		
	Total	3.99 x10 ¹²	18			
Tax (4)	Regression	3.70 x10 ¹¹	1	3.70x10 ¹¹	531.998	0.000
	Residual	1.18 x10 ¹⁰	17	6.96 x10 ⁸		
	Total	3.82 x10 ¹¹	18			

Table 4 assesses the model fitness (ANOVA) for each of the four economic variables. The results indicate that all four models can statistically significantly predict the respective outcome variables as p

values are all less than 0.05. This suggests that the selected independent variables are relevant in explaining changes in private consumption, investment, imports, and tax revenue.

Table 5. Testing Robustness of the Model

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
PVTCON (1)	0.995	0.989	0.989	67657.569
INV (2)	0.961	0.923	0.918	169219.635
IMP (3)	0.990	0.979	0.978	69806.003
Tax (4)	0.984	0.969	0.967	26382.896

Table 5 evaluates the robustness of the models by examining the coefficient of determination (R-squared) for each regression. The high R-squared values in all models (above 92%) indicate that a major portion of the variation in the dependent variables can be explained by the independent variables. This reinforces the models' reliability in explaining changes in private consumption, investment, imports, and tax revenue based on disposable income and GNP.

Hence, the regression analysis results support the notion that disposable income and GNP play crucial roles in shaping various aspects of the Nepalese economy, including private consumption, investment, imports, and tax revenue. These findings align with prior research and highlight the importance of economic growth and income levels in driving economic outcomes, which align with prior research (Uematsu et al., 2016; Siddique et al., 2010; Javid, 2012). However, it's important to consider that economic policies and institutional factors may also influence these relationships, as suggested by Ustubici and Irdam (2011) and Tchanchane et al. (2013).

4.3 Multiplier Effect of Remittances

The study explores the multiplier effect of remittances on a few factors of Nepal's national income, including consumption and investment. This analysis provides valuable insights into how remittances influence these economic aspects over time. The study employs multiplier formulas for estimating the effect of remittances on key economic variables:

$$d(\text{GNP})/d(\text{REM}) = 1/1 - c_1(1 - t_1) - \text{INV} + \text{IMP}$$

$$d(\text{CON})/d(\text{REM}) = c_1(1 - t_1) * d(\text{GNP})/d(\text{REM})$$

$$d(\text{INV})/d(\text{REM}) = d(\text{INV})/d(\text{GNP}) * d(\text{GNP})/d(\text{REM})$$

$$d(\text{IMP})/d(\text{REM}) = d(\text{IMP})/d(\text{GNP}) * d(\text{GNP})/d(\text{REM})$$

where,

c_1 = marginal propensity to consume

t_1 = marginal propensity to tax

i_1 = marginal propensity to invest

m_1 = marginal propensity to import

These formulas allow for a comprehensive examination of how remittances affect Nepal's economic landscape.

Consumption Multiplier: The multiplier of remittances on private consumption ($d(\text{CON})/d(\text{REM})$) is found to be 0.89. This means that for every unit increase in remittances, private consumption increases by 0.89 units. The study then analyzes the historical data (as presented in Table 1) to assess the growth of consumption induced by remittances over the years.

Table 6. Multiplier Effects of Remittance on Consumption

Years	REM	PVTCON	Consumption Induced by Remittance	% Induced to Actual Consumption
01	9798	364641	8720.22	2.391
02	47536	387986	42307.04	10.904
03	54203	418715	48240.67	11.521
04	59604	439725	53047.56	12.064
05	65541	486676	58331.49	11.986
06	97688	558222	86942.32	15.576
07	105444	612635	93845.16	15.3186
08	122403	680474	108938.67	16.0096
09	172483	825204	153509.87	18.603
10	231033	978712	205619.37	21.009
11	257448	1089958	229128.72	21.022
12	341661.3	1167861	304078.5926	26.037
13	421592.3	1318561	375217.1292	28.457
14	548895.7	1493375	488517.1641	32.712
15	585896.6	1662962	521447.9829	31.357
16	715735.5	1861157	637004.595	34.226
17	702260.5	1968898	625011.8628	31.744
18	723075.4	2086285	643537.0704	30.846
19	944531.3	2298747	840632.8392	36.569

Notably, the consumption induced by remittances has seen substantial growth, increasing from 2.40 percent in 2000/01 to 36.56 percent in 2018/19. This indicates that remittances are increasingly significant in driving private consumption in Nepal. This finding aligns with prior studies (Cynthia et al., 2015) highlighting the potential of remittances to stimulate consumption and reduce poverty.

Investment Multiplier: The multiplier of remittances on investment ($d(INV)/d(REM)$) is estimated at 1.25. This suggests that for every unit increase in remittances, private investment increases by 1.25 units. This result indicates that remittances have a pronounced positive effect on investment in Nepal. The induced component of investment due to remittances has steadily increased over time. While this multiplier effect is not explicitly compared with prior studies, it underscores the potential of remittances to bolster investment, which is crucial for economic growth (Uematsu et al., 2016).

Import Multiplier: The study calculates the multiplier of remittances on imports ($d(IMP)/d(REM)$) to be 0.32. This means that for every rupee increase in remittances, imports increase by 0.32 rupees. The analysis highlights the substantial role of remittances in driving import demand in Nepal. These findings align with prior studies (Tuladhar et al., 2014), which emphasize the influence of remittances on the real effective exchange rate and import patterns.

GNP Multiplier: The multiplier of remittances on GNP ($d(GNP)/d(REM)$) is estimated to be 2.10. This suggests that for every rupee increase in remittances, GNP increases by 2.10 rupees. The analysis emphasizes the significant contribution of remittances to Nepal's GNP growth, aligning with prior research (Nishat and Bilgarmi, 1991) highlighting the positive influence of worker's remittances on GNP.

4.4 Multiple Regression Analysis Results

The study employed a multiple regression model to investigate the relationships between remittances (REM), exports (EXP), government expenditure (GEX), and four key economic variables: private consumption (PVTCON), investment (INV), imports (IMP), and Gross National Product (GNP) as

shown in model (7) to (10).

Table 7. Multiple Regression regarding Private Consumption

Model	Unstandardized Coefficient (B)	t	Sig.	V.I.F
(Constant)	376062.2	4.437	0.000	-
REM	1.4936	3.738	0.002	2.4755
EXP	-.8263	-0.704	0.492	3.1256
GEX	2.3451	2.518	0.024	2.7570
<hr/>				
R ² = 0.9677	F – Value =149.746	P-Value =0.000		

Private Consumption (PVTCON): In the case of private consumption, the model is defined as follows:

$$PVTCON = \alpha_0 + \alpha_1 * REM + \alpha_2 * EXP + \alpha_3 * GEX + e_{it}$$

The estimated Equation;

$$PVTCON = 376062.2 + 1.4936 * REM - 0.8263 * EXP + 2.3451 * GEX$$

The multiple regression analysis for private consumption, as shown in Table 7, reveals that **remittances** ($\alpha_1 = 1.4936$) exhibit a significantly positive effect on private consumption, with a p-value of 0.002 (less than 0.05). This result supports the rejection of the hypothesis that remittances have no significant impact on consumption, aligning with several prior studies, including [Bhatta \(2013\)](#), [Ojha \(2019\)](#), and [Uematsu et al. \(2016\)](#), which emphasize the substantial contribution of remittances to household consumption and economic growth. Exports ($\alpha_2 = -0.8263$) have a negative and insignificant effect on consumption, with a p-value of 0.492 (greater than 0.05). This result is consistent with the findings of previous research, such as [Datta and Sarkar \(2014\)](#), suggesting that exports might not directly boost domestic consumption. Government expenditure ($\alpha_3 = 2.3451$) has a significantly positive impact on consumption, with a p-value of 0.024 (less than 0.05), which resonates with the findings of [Ojha \(2019\)](#), underlining the role of government policies in stimulating consumer spending. The model's R² value is 0.9677, indicating that 96.77 percent of the variance in private consumption is explained by the independent variables. Similar analyses were conducted with other variables, too.

Investment (INV): The analysis estimated the multiple regression coefficients for investment as:

$$INV = -530144.4 - 1.7331 * REM + 3.7879 * EXP + 7.0175 * GEX$$

Remittances ($\beta_1 = -1.7331$) have a negative but significant effect on investment, with a p-value of 0.042 (less than 0.05). This implies that remittances negatively influence investment. Exports ($\beta_2 = 3.7879$) have a significantly positive effect on investment, with a p-value of 0.119 (less than 0.05). Government expenditure ($\beta_3 = 7.0175$) also has a positive and significant impact on investment, with a p-value of 0.002 (less than 0.05). The model's R² value is 0.9081, indicating that 90.81 percent of the variance in investment is explained by the independent variables. The negative impact of remittances on investment, as revealed in the multiple regression analysis, may stem from several factors. Firstly, remittances often serve as direct household income, which may lead to increased consumption rather than investment in productive assets or ventures. Individuals receiving remittances may prioritize immediate needs or desires over long-term investment opportunities, thereby diverting funds away from investment channels. Additionally, remittances may create a sense of financial security for recipient households, reducing the perceived need for investment in income-generating activities. This finding aligns with previous research, such as the study by [Uematsu et al. \(2016\)](#), which echoes the idea that remittances, while boosting consumption, might reduce funds available for investment in other sectors. Conversely, the positive and significant effects of exports (EXP) and government expenditure (GEX)

on investment align with the conclusions of earlier studies by [Ojha \(2019\)](#) and [Anjum et al. \(2011\)](#), emphasizing the stimulatory role of these variables in promoting investment.

Imports (IMP): For imports, the model's multiple regression coefficients are estimated as:

$$\text{IMP} = -179606.4 - 0.5423 \cdot \text{REM} + 1.6031 \cdot \text{EXP} + 4.4745 \cdot \text{GEX}$$

The analysis shows that remittances ($\gamma_1 = -0.5423$) have a negative and insignificant effect on imports, with a p-value of 0.119 (greater than 0.05). This suggests that remittances do not significantly impact imports. Exports ($\gamma_2 = 1.6031$) have a positive but insignificant effect on imports, with a p-value of 0.116 (greater than 0.05). Government expenditure ($\gamma_3 = 4.4745$) has a positive and significant effect on imports, with a p-value of 0.000 (less than 0.05). The model's R² value is 0.9583, indicating that 95.83 percent of the variance in imports is explained by the independent variables. The analysis indicates a negative and insignificant impact of remittances on imports (IMP), consistent with prior research like [Datta and Sarkar \(2014\)](#), suggesting that remittances may not significantly affect import patterns. The positive but insignificant influence of exports (EXP) on imports mirrors the findings of previous studies such as [Anjum et al. \(2011\)](#), highlighting that exports alone might not dictate import levels. Meanwhile, the significant and positive relationship between government expenditure (GEX) and imports echoes the conclusions of [Datta and Sarkar \(2014\)](#), emphasizing the role of government spending in driving imports.

Gross National Product (GNP): For GNP, the model's multiple regression coefficients are estimated as:

$$\text{GNP} = 145700.821 + .4289 \cdot \text{REM} + .9058 \cdot \text{EXP} + 6.7169 \cdot \text{GEX}$$

Analysis shows that remittances ($\delta_1 = 0.4289$) have a positive and significant impact on GNP, with a p-value of 0.012 (less than 0.05). This rejects the hypothesis that remittances have no significant impact on GNP. Exports ($\delta_2 = 0.9058$) have a positive but insignificant impact on GNP, with a p-value of 0.340 (greater than 0.05). Government expenditure ($\delta_3 = 6.7169$) has a positive and significant impact on GNP, with a p-value of 0.000 (less than 0.05). The model's R² value is 0.9757, indicating that 97.57 percent of the variance in GNP is explained by the independent variables. The analysis reveals a positive and significant impact of remittances on GNP, in line with the findings of prior research by [Ojha \(2019\)](#) and [Abdullaev \(2011\)](#), which underscore the substantial contribution of remittances to national income. The positive but insignificant effect of exports (EXP) on GNP aligns with the conclusions of [Datta and Sarkar \(2014\)](#), suggesting that exports may not be the sole driver of national income. Additionally, the significant and positive relationship between government expenditure (GEX) and GNP resonates with the findings of [Ojha \(2019\)](#) and [Anjum et al. \(2011\)](#), highlighting the role of government policies in boosting national income.

Table 8. Hypotheses Testing

List of Hypothesis	P-value	Remarks
H ₁ : There is a significant relationship between Remittance and Private Consumption	0.002	Accepted
H ₂ : There is a significant relationship between Remittance and Investment	0.042	Accepted
H ₃ : There is a significant relationship between Remittance and Import	0.119	Rejected
H ₄ : There is a significant relationship between Remittance and GNP	0.012	Accepted

The results highlight the need for targeted policies to channel remittances into productive sectors. While remittances positively impact private consumption, their negative effect on investment underscores the challenge. Policymakers should promote financial literacy, facilitate SME investments, and encourage entrepreneurship.

5. Conclusion

This study provides a comprehensive analysis of the impact of remittances on Nepal's economic resilience using a Keynesian framework. The findings reveal the significant role of remittances in driving consumption, investment, imports, and overall economic growth in Nepal. The multiplier analysis highlights the substantial positive effects of remittances on key macroeconomic variables, with a one-unit increase in remittances leading to notable increases in consumption, imports, investment, and GNP. The multiple regression analysis further confirms the positive and significant relationships between remittances and consumption, imports, and GNP, emphasizing the importance of these financial inflows in Nepal's economic landscape. However, their effect on investment takes a cautious approach, with a negative impact. The study contributes to the existing literature by providing a nuanced understanding of remittances' impact on Nepal's economy, utilizing robust econometric techniques and reliable data sources. The findings have important implications for policymakers, as they underscore the need for strategies to harness remittances for sustainable economic development. While remittances provide short-term benefits and support the livelihoods of millions of households, policymakers should recognize that they are not a panacea for Nepal's long-term economic challenges. Efforts should be directed towards channeling remittances into productive sectors, such as education, health, and infrastructure, to foster inclusive and sustainable growth.

However, the study also has some limitations that should be acknowledged. The analysis is based on secondary data, which may have potential biases or inconsistencies. Additionally, the study focuses on a specific time period and does not capture the impact of recent events, such as the COVID-19 pandemic, on remittances and Nepal's economy. Future research could address these limitations by utilizing primary data and qualitative approaches as suggested by [Devkota et al. \(2023\)](#). Comparative studies with other countries and including additional variables would enhance our understanding of remittances' role in economic resilience. Collaboration between policymakers, researchers, and stakeholders is crucial for developing and implementing effective strategies to leverage remittances for sustainable economic development in Nepal.

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