

AN ANALYSIS OF REMITTANCE INFLOWS AND INFLATION IN A SMALL DEVELOPING ECONOMY OF FIJI: AN ARDL APPROACH

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ABSTRACT

Remittance serves as an important lifeline for many developing and emerging economies. Despite its positive role, the surge in remittance inflows in these economies also bring in economic challenges such as inflation. The aim of this study is to investigate the impact of remittances on the Consumer Price Index (headline inflation), and its components including food, alcoholic drinks and tobacco, durable household goods, and clothing and footwear inflation in Fiji. The study applies autoregressive distributed lag (ARDL) bounds testing estimation proposed by Pesaran et. al (2001) and encompasses the sample period 1986-2021. The result suggest that remittances help to mitigate inflation including other components of inflation in Fiji.

Keywords

Fiji, remittance, inflation, food inflation, alcoholic drinks and tobacco, durable household goods, clothing and footwear

INTRODUCTION

Remittance is defined as the flow of funds by the families working abroad to their loved ones back home, have noted a substantial increase. The flow of these funds contributed immensely towards economic development, poverty reduction,

and welfare improvement for the recipient economies (Alhassan, 2023; Chowdhury et al., 2022; Khan, 2023; Meyer & Shera, 2017; Oluwafemi & Ayandibu, 2014). Given the fact that remittance inflows continue to rise, both researchers and policymakers have raised their concern regarding its potential impact on macroeconomic variables, such as inflation (Narayan et al., 2011; Ngoc & Nguyen, 2014; Sbia & Hamdi, 2020; Upadhyay & Upadhyaya, 2011; Youssef, 2021).

This study investigates the impact of remittance inflows on inflation and its subcomponents. The surge in remittances' have contributed towards GDP of many developing and emerging economies, which can lead to macroeconomic challenges such as inflation (Barajas et al., 2009; Jansen et al., 2012). On one hand, when remittances are primarily directed towards household expenditure, they have the potential to stoke inflation (Anghel et al., 2015; Guha, 2013; Koc & Onan, 2004). Such inflationary pressures, spurred by demand arising from remittances, can have profound ramifications for price stability, income distribution, and overall social welfare in recipient nations. Conversely, remittances might not necessarily lead to inflationary pressures within recipient countries (Hien et al., 2020; Rivera & Tullao, 2020). Given the absorptive capacity of the receiving economies in terms of institutional quality, financial sector, monetary policy can collectively channel the remittances into productive sector of the economy (Russell, 1986). Hence, gaining a better knowledge with regards to the relationship between remittances and inflation is essential for formulating effective monetary policies and driving interventions that bolster macroeconomic stability and sustainable economic growth and development

Given the differing views on the effect of remittances on inflation, this study seeks to add the existing body of literature by analyzing how remittances influences overall inflation as well as sub-categories, including food, alcoholic drinks and tobacco, durable household goods and clothing and footwear in Fiji over the period from 1986 to 2021.

Through this research, we aim to bolster the body of knowledge essential for sustainable economic development, poverty reduction, and improved welfare, with a specific emphasis on the context of remittance-receiving nations, notably the Pacific

Island Countries (PICs). Migration and the flow of remittances are notably high and exhibit a rising trend in PICs. Given the escalating socio-economic challenges faced by the region, the magnitude of remittances is projected to further amplify. Recently, several Pacific Island Countries (PICs) have been actively promoting international labor migration and seeking agreements for both short-term and long-term labor migration with the governments of Australia and New Zealand.

During the period from July 1, 2022, to June 30, 2023, a combined total of nearly 48,000 visas were issued to workers engaged in Australia's PALM (Pacific Australia Labour Mobility) scheme and New Zealand's RSE (Recognised Seasonal Employer) scheme. This figure represents nearly half the 24,975 visas that were issued in 2018-19, which was the last full year of recruitment before the start of the COVID-19 pandemic (Bedford, 2023).

Furthermore, while remittances are also allocated for consumption purposes, including housing construction, the inherent dynamics of PICs must be considered. Given their heavy reliance on international markets and their status as price-takers, surges in demand might not necessarily translate to higher prices for tradable goods. Hence, the link amid remittances and inflation in the PICs likely diverges from other global patterns, presenting a unique economic landscape.

The rest of the study is as follows. Literature review is discussed in Section 2. Section 3 covers the data and methodology while section 4 presents the analysis and discussion. Section 5 concludes the study with policy implications.

LITERATURE REVIEW

Theoretical Review

Remittance Can Increase Inflation

The link between remittances and inflation is well established in the theoretical literature. The income effect theory proposes that remittance inflows escalates the purchasing power and disposable income of recipients causing to higher aggregate demand and possibility of inflationary pressures (Khan & Islam, 2013; Narayan et al., 2011; Perez-Saiz et al., 2019). According to

this theory, remittances directly contribute to increased consumption and investment that acts as a catalyst to stimulate economic growth (Barajas et al., 2009). As household consumption rises, the demand for goods and services increases, potentially pushing prices upward. This effect may be amplified if the supply of goods and services is unable to keep pace with the sudden surge in demand, leading to inflationary pressures (Narayan et al., 2011). In addition, income effect theory also suggest that remittance can have an indirect impact on inflation through their influence on the labor market. Higher remittance inflows can diminish the motivation for domestic labor force engagement, as individuals might choose unemployment or accept lower-paying jobs since they have access to remittance income. This decline in labor supply can result in wage inflation, contributing to an overall increase in the price level within the economy (Glytsos, 1993; Taylor, 1999; Taylor & Wyatt, 1996).

Liquidity preference theory suggests the role of remittance in influencing the domestic money supply which can have implications for inflation (Narayan et al., 2011). According to this theory, remittances introduce foreign currency into the financial system of the recipient country. As these remittances are converted into domestic currency, the money supply expands, potentially generating inflationary pressures (Bayangos & Jansen, 2011; R. Roy & M. Rahman, 2014; Vacaflares, 2012).

Remittance Can Decrease Inflation

In theory, remittances are a credible way to mitigate or decrease inflation through different avenues.

First, recipient of the remittance might also choose to save part of their funds, which impedes immediate consumption. Savings can lower the aggregate demand, thereby mitigating inflationary pressures (Hien et al., 2020; Nersisyan & Wray, 2021).

Second, remittance can also be used to finance investments in dynamic areas of the economy, such as infrastructure or education. This can lead to enhanced productivity, increased supply capacity, and a moderation of inflation (Hien et al., 2020; Rivera & Tullao Jr, 2020).

Third, remittance inflows can also potentially add to the growth of the financial sector in recipient countries. When remittances are channeled through formal financial institutions, it promotes the evolution of banking systems, encourages financial intermediation, and facilitates access to credit and capital for productive investments (Abida & Sghaier, 2014; Giuliano & Ruiz-Arranz, 2009). A well-organized financial sector is directly related to the efficiency of resource allocation, promote investment in productive sectors, and contribute to overall economic stability, thereby reducing inflationary pressures (Al Nasser & Gomez, 2009; Anyanwu, 2010; Ehigiamusoe & Samsurijan, 2021; Stiglitz, 1998; Voghouei et al., 2011).

Empirical Literature

The empirical literature on the impact of remittance on inflation is mixed. Out of the various studies that aimed to show the connection between inflation and remittance, the outcome displays a positive relationship (Abdul-Mumuni & Quaidoo, 2016; Bourdet & Falck, 2006; Dilanchiev et al., 2021; Elahi & Rahman, 2021; Haderi et al., 1999; Hai & Doan, 2017; Iqbal et al., 2013; Jain & Mathur, 2022; Jansen et al., 2012; Joshi, 2022; Khan & Islam, 2013; Narayan et al., 2011; Ngoc & Nguyen, 2014; Nisar & Tufail, 2013; R. Roy & M. Rahman, 2014; Caceres & Saca, 2006). However, there are other studies that found the relationship to be insignificant or negative and it depends on the country of study, methodology and time under investigation (Ball et al., 2013; Durguti et al., 2021; Ghauri et al., 2019; Khurshid et al., 2016; Rivera & Tullao Jr, 2020).

Narayan et al. (2011) investigates the impact of remittance on inflation using a panel dataset of 54 developing countries by employing GMM estimators. The authors found that remittances is positively associated with inflation in the long-run, while the short-run effect is not significant.

Nisar and Tufail (2013) using Johansen cointegration test with a Vector Error-Correction Model (VECM) to evaluate the impact of inflation including food inflation, clothing and housing for the case of Pakistan. The results reported that remittance affects increase all categories of inflation and the coefficient is

highest under food inflation category. R. Roy and M. M. Rahman (2014) also finds that remittances affect food inflation two-half time more than general inflation for the case of Bangladesh.

Khan and Islam (2013) find that remittances cause long-run inflationary pressures in Bangladesh during the period 1972-2010, while the short run effect is insignificant. Similarly, Abdul-Mumuni and Quaidoo (2016) notes that impact of remittances on inflation is positive and significant in the long run while in the short run the effect is insignificant for the case of Ghana.

Le Thanh et al. (2015) utilizes Panel Generalized Method of Movements (PGMM) and data from 32 Asian and Pacific developing countries spanning from 1985 to 2013 and finds that remittance inflow has a significant positive impact on inflation.

Basnet et al. (2021) studies the effect of remittances on inflation in South Asian countries namely, Bangladesh, India, Pakistan and Sri Lanka covering the period 1975 to 2017. In the short term, the inflow of remittances tends to decrease inflation, but in the long term, it has an increasing effect.

Joshi (2022) utilizes Ordinary least Squares (OLS) estimation technique and finds that remittances have positive effect on inflation for the case of Nepal. While Jain and Mathur (2022) finds positive effect of remittances on inflation for the case of India.

Khurshid et al. (2016) using 58 developing and emerging countries as the sample size, finds that the effect of remittances on inflation differs based on the income level of the country. Specifically, with low and lower-middle income countries the effect of remittances on inflation is negative and significant while positive effect is noted in middle-income countries.

Adhikari and Guru-Gharana (2014) establish no significant effect of remittances causing inflation for the case of India. While Yussuff (2018) examine the effect of remittances on inflation using Johansen Cointegration technique and error correction model for the case of Nigeria and finds that remittances causing deflationary effect in the short run and long run. The implication is that a large amount of the remittances sent by migrants to Nigeria are predominantly utilized for investment on productive activities rather than consumption purposes. Similarly, Rivera and Tullao Jr (2020) using VAR, finds weak evidence of

remittances causing inflation for Philippines for the sample period of 2000-2019.

Petkovski et al. (2022) examine the impact of remittance inflows on inflation in Central and Eastern European countries from 1994 to 2019 using the SGMM and Dumitrescu-Hurlin Granger causality approach. The research findings indicate that remittances have a negative and significant influence on inflation in non-EU countries, while a positive impact in EU member countries and in the overall sample. The Granger causality test reveals a unidirectional relationship between remittances and inflation in all country groups.

While the impact of remittances on inflation for the case of Fiji is scarce there are some recent studies which has examined the importance of remittances in their studies. Chen et al. (2020) investigated the effect of remittance on private sector credit in the Pacific Island countries including Fiji and showcases solid evidence that the effect of remittance inflows on private sector credit for PICs is positive. Chand et al. (2021) finds that remittances increase bank stability for Fiji.

BACKGROUND: REMITTANCE AND INFLATION PATTERNS IN FIJI

Remittance¹

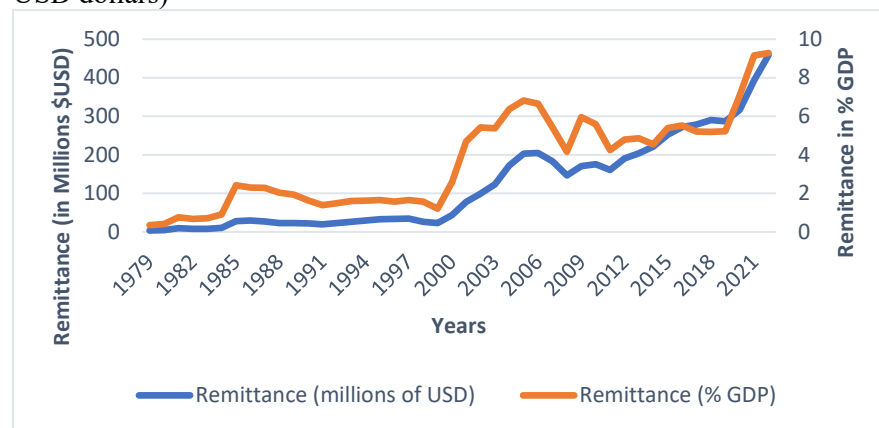
Remittance inflows in Fiji have undergone significant changes over the years. As seen in Figure 1, until 1999, the contribution of remittances to GDP was less than 2%. However, from 2000 until 2006, there was a notable increase in remittances, both in absolute terms and relative to the GDP, averaging around 6% of GDP and \$205 million USD respectively. The years 2007 and 2008 saw a decline in remittances, accounting for 5.42% and 4.16% of GDP, respectively, with a decrease of almost \$60 million USD compared to 2006². From 2009 until 2019, remittance growth remained steady at an average of 6%. However, after 2019,

¹ The empirical study captures data from 1986 to 2021 for Remittance because other categories of CPI data is only available from 1986.

² The decline in remittances for years 2007-2008 is mainly due to Global Financial crisis.

there was a significant increase in remittances, averaging 9% of GDP. In 2022, Fijians received approximately \$450 million USD in remittances, a substantial growth of over 1946% since 1990 when it was only \$22 million USD. This accounted for 9.37% of GDP in 2022, a considerable rise from the 2% recorded in 1990. These figures demonstrate a substantial increase in remittances received by Fijians over time, both in absolute terms and relative to the country's GDP. The growth in remittances since 2019 has been particularly noteworthy, contributing to a higher percentage of GDP compared to previous years. The outcome suggest that factors such as income of migrants, acquisition of higher education prior to migration and the intent to inherit assets from kin in Fiji add to continuous flow of remittances. The increased immigration and the increasing supply of labor both temporary, seasonal and permanent from Fiji to migration destinations are also contributing in the increasing flow of remittances.

Figure 1 Remittance (both in percent of GDP and in millions of USD dollars)



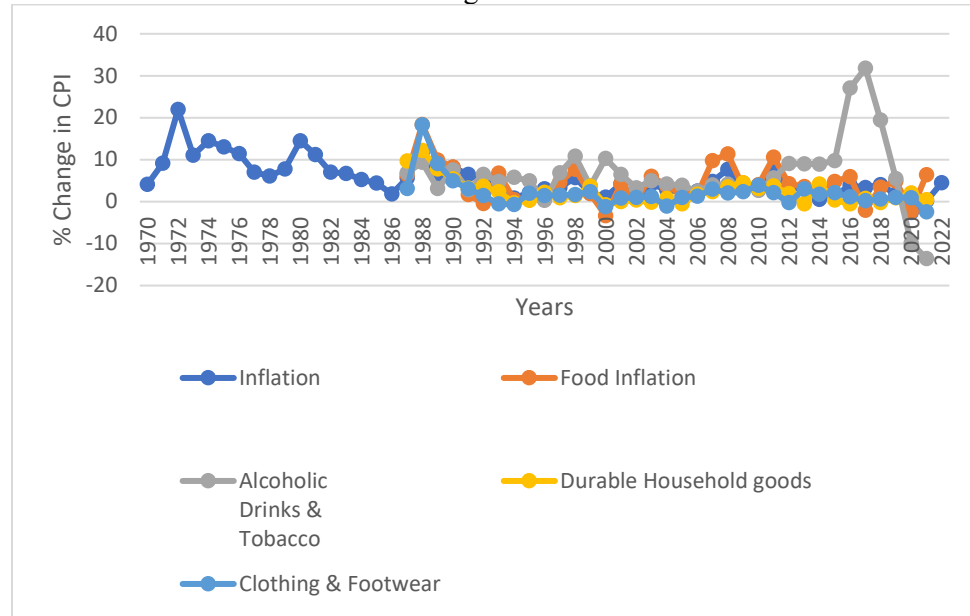
Source: World Development Bank (2023)

Inflation

As seen in **Figure 2** inflation trends in Fiji closely resembled those observed in developed countries and certain developing nations in the region over the past five decades. Like many other countries, Fiji experienced an initial increase in

inflation starting from the mid-1960s, which was further exacerbated by the oil price shocks in the mid-to-late 1970s. Subsequently, inflation declined significantly in the early 1980s. However, unlike several other countries during the latter half of the 1980s, Fiji encountered a substantial rise in inflation, primarily driven by two significant devaluations that occurred in 1987. In the early 1990s, inflation in Fiji followed a downward trajectory in line with the majority of other countries. In 1998, a 20 percent devaluation led to a temporary sharp increase in inflation. There was another temporary increase in inflation in 2007 and 2008 which was caused due to global financial crisis. While Fiji rounded off 2011 with another temporary rise in inflation due to Euro-zone financial crisis and unstable international market. Inflation continued to decrease from there and onwards and recorded negative in 2020 led by lower native demand and decline in import and excise duties and lower global crude oil prices. However, inflation slowly started to increase from 2021. Other categories of inflation followed the same trend apart from alcoholic drinks and tobacco which showed a sharp increase in inflation from 2016 to 2019 due to increase in Yaqona price.

Figure 2 Inflation, Food Inflation, Alcoholic Drinks & Tobacco, Durable Household Goods and clothing and textile



Source: World Development Bank (2023)

METHODOLOGY

In this study, the impact of remittance on inflation and major categories of inflation in Fiji is examined using the autoregressive distributed lag (ARDL) bounds testing approach. The selection of the ARDL approach is motivated by several advantages it offers. First, it demonstrates robustness in small sample sizes, as evidenced by previous research. Second, the ARDL approach does not really need all variables to be incorporated in the same manner before further analysis can be conducted, as highlighted by Pesaran et al. (2001). Third, the ARDL bounds testing approach outlines impartial estimates of the long-run model, even when the variables are endogenous, as indicated by Odhiambo (2009). Considering these advantages in data analysis, the ARDL approach has been chosen for this study.

Variables

Dependent Variables

To explore the effects of remittance on inflation, we utilize consumer price (CPI) index for general items to proxy headline inflation (INF), CPI for food to proxy inflation on food (FI), CPI for alcoholic drinks and tobacco to proxy for inflation on alcoholic and tobacco (ADT), CPI for durable household goods to proxy for inflation on durable household goods inflation (DHG) and CPI for clothing and footwear to proxy for inflation on clothing and footwear (CF) in Fiji.

Independent Variables

Our main variable of interest is remittance (REM) which is expressed as percentage of GDP. Following standard literature, we considered several control variables. Such as Money supply (MS), Real per capita income (RGDPP), Real effective exchange rate (REER) and Trade openness (TOPN)

Theoretical justification of control variables

MS is an important component of monetary policy and plays a significant role in influencing inflation. The impact of increasing the money supply on the price level operates through two transmission mechanisms. The first mechanism is indirect and encompasses variations in the interest rate, while the second mechanism is direct and operates through the channel of aggregate demand. It is imperative to note that the effect of money supply can vary across various consumption categories, resulting in diverse effects on different types of inflation. This observation was highlighted in studies conducted by Nisar and Tufail (2013).

RGDPP another crucial variable on the demand side that can influence inflation. It is anticipated that there is a positive relationship between real per capita income and inflation, once again operating through the channel of aggregate demand (Narayan et al., 2011).

REER can also affect inflation and its effect can differ on different categories of inflation. A change in the real effective exchange rate can affect the prices of imported goods and services. If the value of the domestic currency depreciates, imported goods as a result will become more unaffordable, which can result in

higher inflation (Acosta et al., 2009). Conversely, if the domestic currency appreciates, imported goods become cheaper, possibly causing lower inflation. The extent of this impact depends on the openness of the economy and the share of imported goods in the overall consumption basket (Acosta et al., 2009; Ahmed et al., 2018).

TOPEN according to the hypothesis proposed by Romer (1993), inflation tends to be low in small and open economies. The reason behind this is that trade openness brings about increased efficacy by decreasing expenses through transition in the utilization of inputs both domestically and internationally. This leads to a more efficient distribution of resources and enhances the capacity for utilization. Additionally, trade openness results in an increase in foreign investment, which expands production and leads to higher output. As a result, this helps alleviate pressure on prices.

The discussion above confirms that the control variables employed can significantly impact inflation and different categories of inflation.

Model Specification

The model specification follows Nisar and Tufail (2013). The general model specification takes the following form:

$$\ln INF_t = \beta_0 + \beta_1 \ln REM_t + \beta_2 \ln MS_t + \beta_3 \ln RGDP_t + \beta_4 \ln REER_t + \beta_5 \ln TOPEN_t + \varepsilon_t \quad (1)$$

Where INF_t is headline inflation, food inflation, alcoholic drinks and tobacco, durable household goods or clothing and footwear used interchangeably. These inflation proxies enter the regression equation one at a time, however, it does not have any significant impact on the control variables which in this context remain the same. β_0 is the intercept growth rate. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 represents the coefficients on remittance as a percentage of GDP, MS (broad money) as a percentage of GDP, RGDP (per capita GDP constant 2015 US\$), REER (is the real effective exchange rate (this is a measure of the value of a currency alongside a weighted average of numerous foreign currencies) divided by a price deflator or index of costs), TOPEN

is the trade as a percentage of GDP and the dummy variable captures the structural breaks identified by break-unit root test and finally ε_t is the error terms. All the variables are altered into its natural logarithm form (ln).

So as to carry out bounds testing, we transform equations (1) into a conditional error correction model (ECM) portrayed below:

$$\begin{aligned} \Delta \ln INF_t = & \alpha_1 + \gamma_1 \ln INF_{t-1} + \gamma_3 \ln REM_{t-1} + \gamma_4 \ln MS_{t-1} + \\ & \gamma_5 \ln RGDP_{t-1} + \gamma_6 \ln REER_{t-1} + \gamma_7 \ln TOPN_{t-1} + \\ & \sum_{i=1}^p \varphi_i \Delta \ln INF_{t-i} + \sum_{i=1}^p \phi_i \Delta \ln REM_{t-i} + \sum_{i=1}^p \vartheta_i \Delta \ln MS_{t-i} + \\ & \sum_{i=1}^p \omega_i \Delta \ln RGDP_{t-i} + \sum_{i=1}^p \rho_i \Delta \ln REER_{t-i} + \\ & \sum_{i=1}^p \psi_i \Delta \ln TOPN_{t-i} + \varepsilon_{1t} \end{aligned} \quad (2)$$

where Δ represents the first difference operator, α_1 is the constant, $\gamma_i S$ are coefficients on the lagged levels of the independent variables, $\varphi_i, \phi_i, \vartheta_i, \omega_i, \rho_i, \psi_i$ are the coefficients on the lagged dependent and independent variables, respectively, whereas β_6 denotes the coefficient of the dummy variable which shows structural breaks, ε_{1t} represents the error terms and p represents the maximum lag length.

The ARDL/bounds testing approach consists of dual phases. In the first stage, the focus is on testing the presence of a long-run relationship or cointegration among the variables under examination. If long-run relationship is found through cointegration test, the second stage then comprises estimating the coefficients of the long-run relations. Cointegration indicates that short-term hindrances will not become a barrier in the long-term equilibrium relationships between the variables.

To examine the prevalence of a long-run relationship, the F-statistic is employed as a bounds test. Specifically, the F-test is used to assess the joint significance of the coefficients of the lagged levels in Equations (2).

The null hypothesis that signifies the absence of a long-run relationship is represented as $\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = \gamma_6 = 0$. As per Pesaran et al. (2001) critical values for the F-statistic are determined based on the assumption that all variables are I(0),

which establishes the lower bound values. While the upper bound values assume all variables are $I(1)$. If the computed F-statistic surpasses the upper bound, it signifies a significant long-run relationship. Consequently, the null hypothesis of no cointegration is rejected. Conversely, if the F-statistic lies within the bounds, the inference remains inconclusive. In such cases, a thorough understanding of the time series properties of the variables is necessary before drawing any conclusions. To determine the order of the ARDL model, we employ the Akaike Information Criterion (AIC). The AIC takes into consideration the trade-off between model complexity and goodness of fit, providing a measure for selecting the most suitable model.

Subsequently we moved to estimate the Error Correction Model (ECM) along with the short-run parameters. It is important that the Error Correction term is negative and significant at the conventional level to ensure that the long-run relationship exists. The value of the EC coefficient indicates the rate at which the system returns to equilibrium. It generally falls between -1 and 0. A value of -1 signifies immediate and complete adjustment, while a value of 0 implies no adjustment following a disturbance in the system

Data Sources

This study utilizes annual time series data spanning from 1986 to 2021 to investigate the impact of remittances on overall inflation and its subcategories. Inflation data, including general inflation (INF), food inflation (FI), inflation for alcoholic drinks and tobacco (ADT), durable household goods (DHG), and clothing and footwear (CT), were obtained from the Reserve Bank of Fiji's website. Data for the remaining variables—remittances (REM), money supply (MS), real GDP per capita (RGDPP), real effective exchange rate (REER), and trade openness (TOPN)—were sourced from the World Development Indicators Database. The analysis was conducted using EViews 13 software

EMPIRICAL ANALYSIS

Descriptive Analysis

Table 1 shows the descriptive statistics and pairwise correlation. The growth rates range from a high of 8.65 per cent (RGDP) to a low of 0.18 per cent (REM). Volatility also ranges from a high of 0.61(REM) to a low of 0.09 (REER). The strongest pairwise correlation is between INF and FI of 0.99³ and the weakest between REER and CF of -0.72.

Table 1 Descriptive Statistics and Pairwise Correlation

Variables/Statistics	INF	FI	ADT	DH G	CF	REM	MS	GDP P	REE R	TOP N
Descriptive Statistics										
Mean	4.22	4.15	1.78	4.39	1.92	1.22	4.06	8.32	4.74	4.72
Maximum	4.75	4.81	2.36	4.64	2.03	2.08	4.50	8.65	5.08	4.91
Minimum	3.47	3.34	1.34	3.86	1.71	0.18	3.67	8.02	4.61	4.27
Std.Dev	0.37	0.42	0.29	0.19	0.08	0.61	0.24	0.16	0.09	0.15
Observations	36	36	36	36	36	36	36	36	36	36
Correlation										
INF	1									
FI	0.99	1								
ADT	0.96	0.96	1							
DHG	0.98	0.97	0.91	1						
CF	0.98	0.97	0.91	1.00	1					
REM	0.76	0.74	0.77	0.66	0.66	1				
MS	0.86	0.88	0.84	0.83	0.83	0.74	1			
GDPP	0.94	0.92	0.94	0.90	0.90	0.71	0.73	1		
REER	-0.72	-0.71	-0.60	-0.78	-0.78	-0.52	-0.52	-0.56	1	
TOPN	-0.12	-0.18	-0.31	-0.04	-0.03	-0.22	-0.33	-0.12	-0.25	1

Source: Authors' own computation using EViews 13.

³ The high correlation is noted mainly because both are dependent variables.

Unit Root Test

We begin by examining the presence of unit roots to assess the properties of the time series using three tests: the Dickey-Fuller generalized least squares (DF-GLS) test (Elliott et al., 1996), the Phillips-Perron (PP) test, and the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test. The DF-GLS and PP tests hypothesize that the series is non-stationary (i.e., contains a unit root) under the null hypothesis, while the KPSS test assumes the series is stationary (i.e., does not contain a unit root). The results of these tests provide strong evidence that most of the variables are non-stationary at their levels (indicating the presence of unit roots) but become stationary after first differencing. (see Table 2).

In the presence of structural breaks within a time series, the reliability of conventional unit root tests becomes unstable (Perron, 1989). Table 3 reports the Perron (1989) breakpoint unit root test. The findings indicate that, when the variables are in their original level form, the null hypothesis of a unit root cannot be rejected for most variables. However, when the variables are analyzed in terms of their first differences, the null hypothesis can be rejected for all variables. Thus, we settled with ARDL model for estimation.

Cointegration test

The bounds test shows that a long-run relationship exists for all the series as reported in Table 4. According to the rule of thumb, if the F-statistic exceeds the critical value associated with the upper bound $I(1)$, it can be inferred that cointegration exists (Nkoro & Uko, 2016). Based on the results presented in Table 4 the null hypothesis is rejected as the F-statistic equals 8.49, 6.79, 4.21, 12.12 and 9.12 respectively, surpassing all critical values for the upper bound $I(1)$. To proceed with the analysis and establish the impact of remittance on inflation and different categories, an optimal length for respective models is selected using Akaike information criteria (AIC) and are also reported in Table 4 for the respective models

Table 2 Results for Unit Root Test

Variable	Deterministic Term	DF-GLS	PP	KPSS
Levels				
lnINF	Constant, Trend	-1.920	-2.469	0.123*
lnFI	Constant, Trend	-2.061	-2.773	0.089
lnADT	Constant, Trend	-4.528***	-1.821	0.138
lnDHG	Constant, Trend	-2.139	-4.623***	0.101
lnCF	Constant, Trend	-2.109	-3.164**	0.104
lnREM	Constant, Trend	-1.953	-2.186	0.089
lnMS	Constant, Trend	-1.764	-2.080	0.083
lnRGDPP	Constant, Trend	-3.127*	-2.073	0.080
lnREER	Constant, Trend	-2.834	-4.538***	0.113
lnTOPN	Constant, Trend	-2.255	-2.846	0.227***
First Difference				
lnINF	Constant, Trend	-4.262***	-4.142**	0.108
lnFI	Constant, Trend	-4.756***	-4.643***	0.108
lnADT	Constant, Trend	-2.89*	-4.421***	0.105
lnDHG	Constant, Trend	-4.234***	-4.262***	0.107
lnCF	Constant, Trend	-4.623***	-4.144***	0.104
lnREM	Constant, Trend	-4.863***	-4.734***	0.100
lnMS	Constant, Trend	-4.901***	-4.761***	0.070
lnRGDPP	Constant, Trend	-4.262***	-4.885***	0.087
lnREER	Constant, Trend	-4.150***	-5.962***	0.075
lnTOPN	Constant, Trend	-7.263***	-9.510***	0.114

Source: Authors' own computation using EViews 13. Note: ***, ** and * denotes significant level at 1%, 5% and 10% respectively.

Table 3 Unit Root Test with Breakpoints

Variable	Deterministic Term	Fiji	Break Date
Levels			
lnINF	Constant, Trend	-3.536	2019
lnFI	Constant, Trend	-5.519***	2010
lnADT	Constant, Trend	-5.071**	2016
lnDHG	Constant, Trend	-7.512***	2008
lnCF	Constant, Trend	-4.400	2020
lnREM	Constant, Trend	-6.776***	1999
lnMS	Constant, Trend	-3.861	2015
lnRGDPP	Constant, Trend	-4.671*	1999
lnREER	Constant, Trend	-3.912	2017
lnTOPEN	Constant, Trend	-4.147	2013
First Difference			
lnINF	Constant, Trend	-5.118***	2005
lnFI	Constant, Trend	-5.397***	2006
lnADT	Constant, Trend	-6.971***	2015
lnDHG	Constant, Trend	-4.812**	2005
lnCF	Constant, Trend	-5.620***	
lnREM	Constant, Trend	-5.746***	2005
lnMS	Constant, Trend	-5.253***	2000
lnRGDPP	Constant, Trend	-8.975***	2019
lnREER	Constant, Trend	-7.066***	1999
lnTOPEN	Constant, Trend	-7.214***	2006

Source: Authors' own computation using EViews 13.

Note: ***, ** and * denotes significant level at 1%, 5% and 10% respectively; we utilize augmented Dickey-Fuller test in conducting the breakpoint unit root test.

Table 4 Bounds test results for Model 1(INF) and Model 2 (FI)

Model 1 (INF)	Model 2 (FI)	Model 3 (ADT)	Model 4 (DHG)	Model 5 (CF)
ARDL optimal	ARDL optimal	ARDL optimal	ARDL optimal	ARDL optimal
Lag structure	lag structure	lag structure	lag structure	lag structure
(1,3,2,3,3,3)	(1,3,0,3,2,2)	(1,0,0,3,3,3)	(1, 3, 3, 0, 3, 2)	(1,2,0,1,1,1)
F-statistics	F-statistics	F-statistics	F-statistics	F-statistics
8.490***	6.787***	4.212***	12.123***	9.124***

Critical Values and significance level		
Significance level	Lower bound, I(0)	Upper bound, I(1)
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: Authors' own computation using EViews 13.

*Statistically significant at 10% level, ** statistically significant at 5% level, ***statistically significant at 2.5% level, ****statistically significant at 1% level

Table 5 reports the results for the five models respectively. We note that the effect of remittance on inflation, food inflation, durable housing goods and clothing and footwear is negative and statistically significant both in the long and short run. More importantly the highest negative coefficient is on food inflation, followed by clothing and footwear, durable household goods and then general inflation. Our findings differ from some of the earlier studies (Jain & Mathur, 2022; Joshi, 2022; Narayan et al., 2011; Nisar & Tufail, 2013; Youssef, 2021). However, it is consistent with Rivera and Tullao Jr (2020). This finding is not unique for Fiji, as Prakash and Mala (2016) also argued in their study that remittance is diverted to productive and investment purpose for the case of Fiji and not necessarily causing Dutch disease. Moreover, result is not surprising for Fiji as most of the inflation in Fiji is imported inflation and consistent inflow of remittances helps to keep interest rate low (Narayan et al., 2006). Since remittance in Fiji does not lead to inflation, families who receive remittances may invest in productive activities, such as starting businesses or expanding existing ones. This can stimulate economic growth, enhance employment opportunities, and contribute to increased domestic production of goods, including

food. With higher domestic production, there is a reduced reliance on imported food, which can help stabilize food prices and alleviate food inflation (Ratha, 2007).

Meanwhile money supply has positive and statistically significant coefficient in long run under inflation, food inflation, durable housing goods and clothing and footwear models. While the effect of money supply on short run is insignificant in most instances. The positive effect of money supply is consistent with theory of money supply and is also consistent with the findings of earlier studies (Hai & Doan, 2017; Narayan et al., 2011; Youssef, 2021).

Moreover, real GDP per capita reports positive and significant relationship with inflation and all categories of inflation apart from food inflation. The significant associations between real GDP per capita and different categories of inflation underline the broad-based nature of this relationship. It implies that as the population's purchasing power increases, the prices of goods and services across various sectors, excluding food, tend to rise. This could be attributed to factors such as increased consumer spending, higher wages, and improved overall economic activity. However, it is important to highlight that this relationship does not hold true for food inflation, which suggests that factors other than real GDP per capita play a more dominant role in shaping food prices within the economy. In the short run period, the effect is mostly insignificant except for Alcoholic Drinks & Tobacco whereby it has positive effect.

The impact of real effective exchange rate on inflation and different categories mainly remains negative irrespective to the time frame. Fiji is a small country whereby our import to GDP stands more than 50% (Kumar & Patel, 2022). If a country is heavily dependent on imports for its supply, changes in the real effective exchange rate can have a significant impact on food or general prices. A depreciated currency can increase the cost of imported food items, leading to higher food inflation. On the other hand, an appreciated currency can lower import costs and contribute to lower food and overall inflation (Liu & Chen, 2017).

Finally, the effect of trade openness on inflation is positive under inflation, alcoholic drinks & tobacco and clothing and footwear in long run. The benefits of trade may be

accompanied by increased price pressures (Narayan et al., 2011). The positive effect of trade openness on overall inflation suggests that as a country engages in international trade and opens up its markets, it can lead to an increase in the general price level. This could be due to various factors such as increased competition, changes in supply and demand dynamics, and fluctuations in exchange rates. The positive relationship between trade openness and inflation implies that a more open economy tends to experience inflationary pressures over the long term. Furthermore, the positive impact of trade openness on inflation within the categories of alcoholic drinks and tobacco, as well as clothing and footwear, suggests that these sectors are particularly susceptible to price increases when trade barriers are reduced. The entry of foreign goods, competition from international producers, and changes in import/export dynamics can contribute to inflation within these specific sectors.

Diagnostic and Stability Test

The final step in the empirical analysis is to perform the diagnostic tests. Table 6 reports that the both the models are satisfied with no serial correlation and heteroskedasticity problems. The models are also satisfied with normality test. Figure 2 reports the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) for all five models and it is found to be stable at 5% level of significance.

Table 5 Empirical Results for Model 1- Model 5

Model	Model 1: INF		Model 2: FI		Model 3: ADT		Model 4: DHG		Model 5: CF	
Regressor	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
Panel 1: long-run results										
C	-0.009	-3.532***	0.004	6.986***	-0.006***	8.129***	0.013	9.029***	-0.119	-2.023**
REM	-0.004	-1.940*	-0.034	-2.592**	-0.017	-0.671	-0.059	-5.914***	-0.026	-2.606**
MS	0.434	2.612**	0.130	1.482*	-0.023	-0.222	0.166	5.151***	0.027	2.921***
RGDPP	1.475	2.592**	-0.163	-1.478*	1.659	3.989***	0.026	2.929***	0.074	1.929*
REER	-1.738	-2.898***	-0.599	-2.998***	-1.034	-	-0.463	-7.561***	-0.115	-2.924***
						2.806***				
TOPEN	0.071	1.613*	-0.060	-0.549	-0.658	-2.633**	0.013	0.413	0.026	2.074**
Panel 2: short run results										
ΔREM	-0.045	-3.624***	-0.120	-3.998***	-0.011	-0.663	-0.011	2.121*	-0.016	-3.914***
ΔREM(1)	0.033	2.021*	0.086	3.213***	-	-	-0.042	-3.669***	0.007	1.821*
ΔREM(2)	-0.023	-1.764*	-0.066	-2.727**	-	-	-0.003	-0.383	-0.008	-2.176**
ΔREM(3)	0.0460	3.219***	0.069	2.923***	-	-	-0.024	-2.722**	-	-
ΔMS	-0.036	-0.956	-0.119	-1.449	-0.014	0.661	-0.058	-2.123**	0.016	1.250
ΔMS(1)	0.105	2.399**	-0.038	-0.456	-	-	0.066	2.291**	-	-
ΔMS(2)	0.209	4.260***	0.194	2.456**	-	-	0.148	4.486***	-	-
ΔMS(3)	-	-	0.109	1.891*	-	-	0.072	2.119**	-	-
ΔRGDPP	-0.089	-1.518*	-0.182	0.141	0.251	3.027***	0.036	0.921	0.001	0.062
ΔRGDPP(1)	0.383	4.203***	-	-	0.366	3.141***	-	-	0.045	1.986*
ΔRGDPP (2)	0.321	2.859**	-	-	0.202	1.479*	-	-	-	-
ΔRGDPP (3)	0.327	3.288***	-	-	0.118	1.256	-	-	-	-

$\Delta REER$	-0.412	-4.398***	0.146	1.921*	-0.218	-2.282**	-0.117	-2.857***	-0.031	-1.822*
$\Delta REER(1)$	-0.229	-3.466***	-0.126	-1.000	0.058	0.733	-0.296	-5.560***	-0.040	-2.269**
$\Delta REER(2)$	-0.222	-3.677***	-0.399	-3.221***	-0.212	-	-0.136	-2.493**	-	-
						2.722***				
$\Delta REER(3)$	-0.212	-2.592**	-	-	-0.252	-	-0.085	-1.990*	-	-
						3.211***				
$\Delta TOPEN$	0.121	3.445***	-0.002	1.971*	-0.017	-0.328	-0.056	-2.486**	-0.007	-0.073
$\Delta TOPEN(1)$	-0.010	-0.299	0.034	0.569	-0.141	-	0.026	1.056	-0.023	2.147**
						2.909***				
$\Delta TOPEN(2)$	-0.107	-3.184***	-0.099	-1.729*	-0.176	-	0.048	2.118**	-	-
						3.466***				
$\Delta TOPEN(3)$	0.04	1.562*	-	-	-0.061	-1.403	-	-	-	-
ECM	-0.638	-9.583***	-1.114	-7.582***	-0.601	-	-1.360	-8.632***	-0.721	
cointEq						5.879***				

Source: Authors' own computation using EViews 13.

Note: ***, ** and * denotes significant level at 1%, 5% and 10% respectively

Table 6 Results of Diagnostic Tests.

Model 1 (INF)	Model 2 (FI)	Model 3 (ADT)	Model 4 (DHG)	Model 5 (CF)
ARDL optimal	ARDL optimal	ARDL optimal	ARDL optimal	ARDL optimal
Lag structure	lag structure	lag structure	lag structure	lag structure
(1,3,2,3,3,3)	(1,3,0,3,2,2)	(1,0,0,3,3,3)	(1, 3, 3, 0, 3, 2)	(1,2,0,1,1,1)
F-statistics	F-statistics	F-statistics	F-statistics	F-statistics
8.490***	6.787***	4.212***	12.123***	9.124***

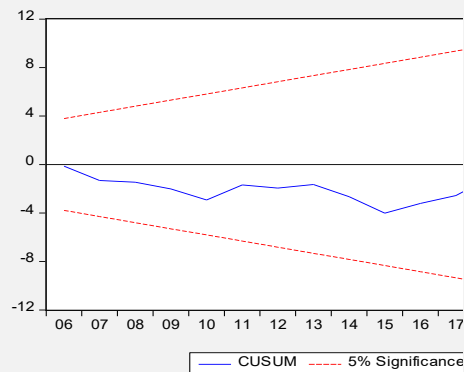
Critical Values and significance level		
Significance level	Lower bound, I(0)	Upper bound, I(1)
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: Authors' own computation using EViews 13.

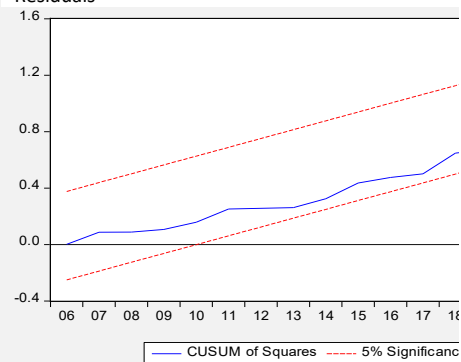
Figure 2 Model Stability Test

Model 1: Inflation

Plot of Cumulative Sum of Recursive Residuals



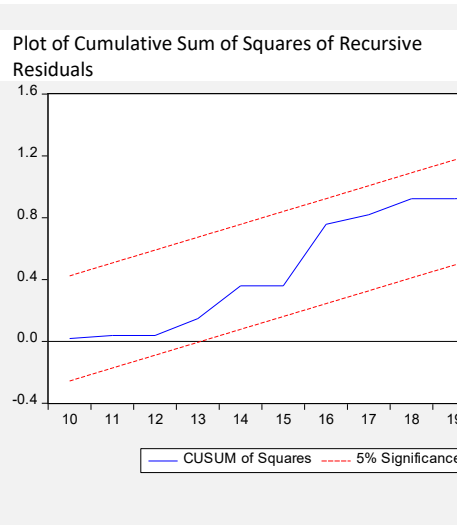
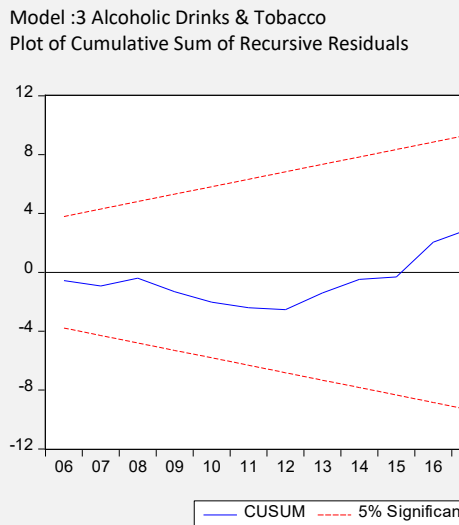
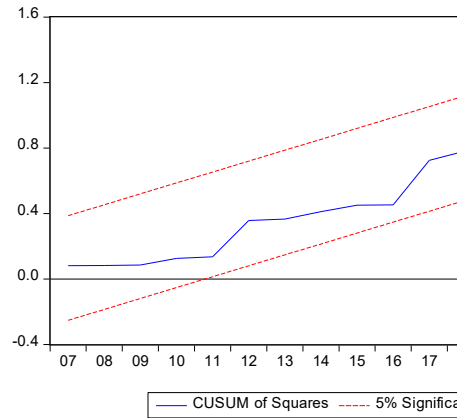
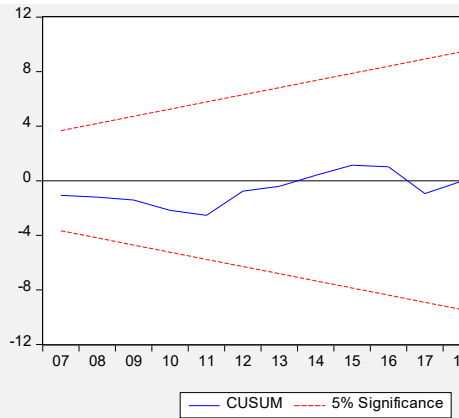
Plot of Cumulative Sum of Squares of Recursive Residuals

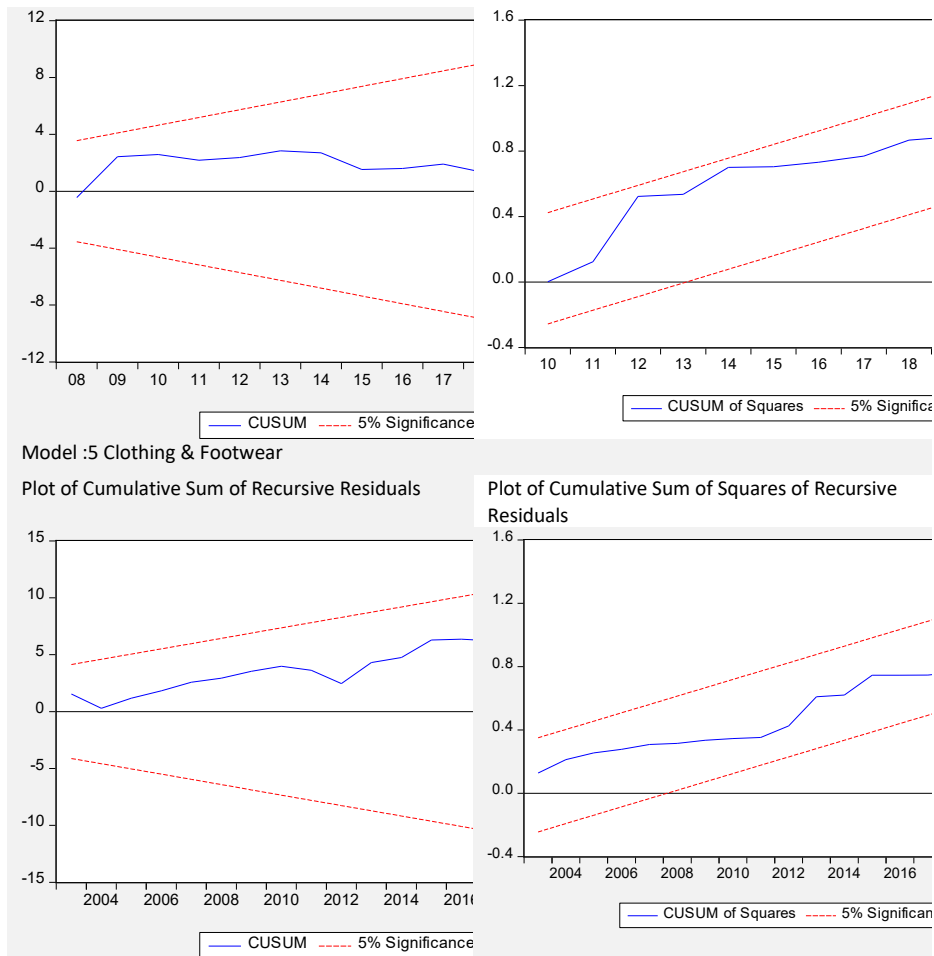


Model :2 Food inflation

Plot of Cumulative Sum of Recursive Residuals

Plot of Cumulative Sum of Squares of Recursive Residuals





CONCLUSION

Remittances play a crucial role in providing foreign exchange earnings and income support for many developing and emerging economies. However, the inflow of remittances can also have adverse effects, such as contributing to inflation. This study examines the impact of remittances on overall inflation and its subcategories—including food inflation, alcoholic drinks and tobacco, durable household goods, and clothing and footwear—using annual time series data from 1986 to 2021 for Fiji. The

ARDL bounds testing approach was employed to explore the relationship. The findings indicate that an increase in remittances has a negative effect on inflation, with these results being consistent across various inflation categories, including food inflation, durable household goods, and clothing and footwear. Notably, the effect was most significant in the case of food inflation.

The findings suggest that remittances in Fiji do not directly cause inflation, as other factors such as money supply, trade openness, and real per capita income play a more dominant role. Based on these results, we can challenge existing literature by arguing that remittances may be relatively beneficial to the economy. It is recommended that future studies explore the remittance-inflation relationship using alternative methodologies and gather empirical evidence from different economies. Consistent with the findings of Khurshid et al. (2016) and Rivera & Tullao (2020), the impact of remittances on inflation may vary depending on the prevailing economic conditions

Despite significant progress in understanding the role of remittances, the varied and economy-specific evidence regarding their impact on macroeconomic variables like inflation highlights the need for further studies using alternative approaches. Our findings provide empirical evidence that challenges the common belief that remittances destabilize the macroeconomy. As a result, policymakers should continue to promote strategies and programs that direct remittance funds toward productive investments—such as small businesses, education, and healthcare—rather than non-productive consumption. To maximize the benefits of remittances for poverty reduction and economic development while minimizing inflationary pressures and other potential drawbacks, a thoughtful, multifaceted approach is necessary. Governments should tailor their policies to the unique needs and conditions of their country, considering factors like the size and stability of remittance inflows.

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