Term Paper (Consumption & Investment Dynamics)

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International remittances versus Tax bonuses amid the COVID-19 pandemic.Different sources, same results?

Abstract

International remittances is now an important source of private external funding. This study aims to test if remittances can act a substitute for government tax bonuses in developing economies in periods of economic shock.

1 Introduction

The role of international remittances as a vital source of private external funding has surged in significance for developing and emerging economies in recent years. Existing literature highlights various benefits associated with remittances, including their function as insurance against risky activities, their role in reducing income inequality, their capacity to smooth household consumption against adverse shocks, their influence on increasing household propensity to save, and their contribution to poverty alleviation. Moreover, studies have shown that remittances play a pivotal role in reducing output volatility, fostering financial sector growth, and ultimately boosting economic development [1][2].

Against this backdrop, this study aims to explore how changes in consumption elasticity to income, induced by tax bonuses in developed economies, compare with changes in consumption elasticity to income resulting from international remittance inflows in developing countries, particularly in the context of the COVID-19 pandemic. Additionally, the paper seeks to assess the validity of the Permanent Income Hypothesis (PIH) amidst the COVID-19 crisis, both for developed and developing economies. The findings of this study will be compared to those of Broda and Parker (2014), Parker (1999), and Shapiro and Slemrod (2003, 2009) to ascertain whether the influence of remittances on consumption in developing countries aligns with the impact of government tax bonuses on consumption in developed nations.

The PIH states that individuals do not adjust their consumption levels in response to temporary fluctuations in income but rather modify their consumption patterns based on expectations of future income changes, aiming for consumption smoothing. However, the assertion of the PIH has faced scrutiny in the literature. While some studies provide evidence supporting the PIH, others suggest the presence of excess sensitivity and excess smoothness, contradicting the assumptions of the hypothesis.

This study aims to contribute to the existing literature by underscoring the critical role of international remittances in driving economic growth in developing economies, particularly during times of aggregate economic shocks. Furthermore, it seeks to add to the discourse on the importance of integrating macroeconomic details into life-cycle models like the PIH. By examining the dynamics of consumption behavior in response to income changes and remittance inflows, the study endeavors to provide valuable insights into the mechanisms shaping economic resilience and growth in both developed and developing economies, especially in the face of global crises such as the COVID-19 pandemic.

The rest of the paper is structured into three (3) sections. The second (II) section provides an extensive literature review that covers both theoretical and empirical reviews of the topic. The third (III) section provides a description of the data sources and the methodological approach that is used in this paper. The last section (IV) concludes the paper.

2 Literature Review

2.1 Theoretical Review

Following the work of Parker (1999), I assume the following Euler equation[3]:

$$u'(c_t)v(z_t) = \beta R_t E_t[u'(c_{t+1}v(z_{t+1}] \ldots\ldots (1)$$

where, E_t represents the expectation operator; $u'(c_t)$ and $u'(c_{t+1})$ is the marginal utilities for current and future non-durable consumption respectively; z_t is a vector of deterministic variables that can change the marginal utilities of non-durable consumption; β is the discount factor; R_t is the gross after-tax real interest rate between t and $t+1$.

By assuming that consumption is log-normally distributed and the utility function exhibits constant relative risk aversion. We can rewrite the Euler equation above as:

$$\Delta ln(c_{t+1}) = \sigma ln(\beta R_t) + \sigma ln(\frac{v(z_{t+1})}{V(z_t)}) + \frac{1}{2\sigma} E_t[Var(\Delta ln(c_{t+1}))] + \epsilon_{t+1} \ldots\ldots (2)$$

where $\epsilon_{t+1} \equiv ln(c_{t+1} - \mathrm{E}_t[ln(c_{t+1})]$. σ is the intertemporal elasticity of substitution which given by the inverse of the coefficient of relative risk aversion.

According to the Permanent Income Hypothesis, if expectations are formed rationally and variations in the conditional variance term are unpredictable, then factors known to the household at time t apart from R_t and $\frac{v(z_{t+1})}{v(z_t)}$, such as income fluctuations generated by receiving remittances, should not change the growth rate of consumption in equation (2)

The reasons why predictable changes in income might affect consumption can be deduced from the log-linearized version of the Euler equation.

First of all, expectations might not be formed using all available information, so that ϵ_{t+1} is not uncorrelated with all factors known to the household at time t.

Second, marginal utility smoothing does not mean consumption smoothing because there might be predictable variations in the conditional variance term due to the precautionary saving motive.

Finally the Euler equation might not hold for some households, for example due to difficulties in borrowing at R_t.

2.2 Empirical Review

2.2.1 Permanent Income Hypothesis

Broda and Parker (2014)[4] analyzed data from AC Nielsen's scanner to explore how the issuance of the 2008 rebates affected consumer behavior in the United States. They discover a substantial positive impact of this disbursement on the purchase of non-durable goods. Specifically, they observe that within the quarter immediately following the receipt of the rebate, consumer spending sees a significant rise, amounting to an increase of approximately 60 to 90 dollars. This suggests that households tend to allocate a considerable portion of the rebate towards the acquisition of items such as groceries, personal care products, and other essentials, contributing to a boost in overall consumption during this period.

In contrast, Aisbett et al. (2024) conducted research using data akin to Broda and Parker's (2014) during the same time frame, yet their findings in Australia differed from those observed in the United States. Aisbett et al. utilized weekly data from the AC Nielsen Homescan panel to investigate how fiscal transfers influenced non-durable consumption expenditures among Australian households. Contrary to expectations, their analysis revealed that, on average, Australian households did not significantly alter their non-durable consumption expenditures during or after receiving the one-time transfer[5].

The authors identified two main reasons for this discrepancy between Australia and the United States. Firstly, unlike the U.S., Australia was not undergoing a macroeconomic downturn when the stimulus payments were disbursed. Secondly, Australian households faced fewer liquidity constraints, particularly concerning housing. Unlike in the U.S., where homes are often considered illiquid assets, Australian households had access to mortgage offset accounts and redraw facilities in the mortgage market, providing greater liquidity.

Aisbett et al. suggested that incorporating institutional and macroeconomic details into life-cycle models is essential for a comprehensive understanding of consumption behavior. Their findings underscored the importance of considering aggregate economic factors and institutional frameworks when assessing the impact of fiscal policies on household spending patterns

Shapiro and Slemrod (2003, 2009) analyzed survey data to estimate the influence of tax rebates on consumer spending. Their analysis of the 2008 rebate revealed that households typically allocate around one-third of the rebate amount towards expenditures, aligning with their earlier findings from the 2001 rebate study. In a different study, they also they compared the effects of the 2008 rebate with the continuous payments throughout 2009 resulting from reduced withholding [6]. The study indicated that the one-time payment in 2008 had a more significant impact on consumption. They attribute this difference primarily to the heightened visibility of the 2008 rebate compared to the gradual and less noticeable nature of the 2009 payments dispersed over time. This suggests that the timing and visibility of rebate distributions play crucial roles in influencing consumer spending behaviors. Essentially, when households receive a lump-sum rebate that is easily noticeable, they are more inclined to allocate a larger portion of it towards immediate spending compared to payments distributed over an extended period[7][8].

2.2.2 Remittances, Consumption & Income Smoothing

Amuedo-Dorantes and Pozo (2010)[9] conducted a study to investigate the role of remittances in stabilizing income volatility in developing countries, focusing on Mexico. They argued that factors such as the absence of reliable social insurance programs, insufficient liquid savings, and constraints on borrowing, particularly among impoverished households, contribute to a decline in living standards and diminish the likelihood of escaping poverty. In this context, remittances emerge as a significant factor in mitigating the income volatility experienced by these households. The researchers utilized household-level data spanning from 2000 to 2008 from the Mexican Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH), which provides comprehensive information on the composition and distribution of income and expenditure among Mexican households. Their findings indicated that remittances have the potential to partially stabilize household income volatility, despite income smoothing not being the primary motive behind remittance transfers. Notably, Amuedo-Dorantes and Pozo (2010) observed that households headed by females, households with larger family sizes, fewer educated or employed members, and those residing in rural areas were particularly susceptible to higher income volatility. This emphasizes the importance of understanding the demographic and socioeconomic factors influencing household income dynamics. The authors stressed the importance of policymakers designing remittance-related policies aimed at stabilizing household incomes in developing countries. Their study provides valuable insights into the potential of remittances to alleviate income volatility and improve economic resilience among vulnerable households, highlighting the significance of targeted interventions in this regard.

Combes and Ebeke (2011) conducted an analysis on the impact of remittances on household instability in developing countries. Their study, based on econometric analysis of a large cross-sectional panel dataset spanning 87 developing countries from 1975 to 2004, yielded several noteworthy findings that underscore the importance of remittances in such contexts. Firstly, they discovered that remittances play a significant role in reducing household consumption instability. This suggests that households receiving remittances are better equipped to maintain stable levels of consumption, even amidst various economic and environmental shocks. Additionally, they found that remittances act as a form of insurance, mitigating the effects of diverse shocks such as natural disasters, agricultural fluctuations, fiscal policy changes, financial crises, and exchange rate volatility on household consumption stability. This highlights the resilience-building function of remittances in cushioning households against adverse events [10]. Another intriguing result of their analysis was the observation that the stabilizing impact of remittances is more pronounced in countries with less developed financial systems. This suggests that remittances serve as a crucial safety net in regions where formal financial institutions may be less accessible or reliable. Furthermore, their study revealed a threshold effect regarding the proportion of remittances to GDP. They found that the stabilizing effect of remittances diminishes once remittance inflows exceed 6% of a country's GDP. This implies that while remittances provide stability up to a certain level, excessive reliance on remittances may lead to dependency and undermine overall economic resilience. In a nutshell, their findings highlight the multifaceted role of remittances in bolstering household stability and resilience in developing countries, while also pointing to potential limitations and challenges associated with their excessive reliance.

2.2.3 Remittances & Economic Growth amid COVID-19

Economic growth can be ascribed to a myriad of factors, encompassing both economic and non-economic drivers. Among these are foreign direct investment, technological advancements, the development of human capital, foreign aid, and political stability. However, in recent years, remittances sent by nationals residing abroad have emerged as a significant contributor to economic growth, particularly in developing countries. These remittance inflows have become increasingly vital for sustaining economic development and often constitute a major source of financial support for recipient nations.

The World Bank claims that migrant transfers to low- and middle-income countries (LMICs) have exceeded foreign direct investment (FDI), marking an important milestone in the monitoring of the resource flows to developing countries. Remittance flows to Latin America and the Caribbean, East Asia and the Pacific, Europe and Central Asia, the Middle East and North Africa, South Asia, and Sub-Saharan Africa will be $136 billion, $56 billion, $103 billion, $56 billion, $147 billion, and $42 billion in 2020, respectively, according to a regional remittance trend [11]. India received $83 billion from remittances in 2020, followed by China ($60 billion), Mexico ($43 billion), the Philippines ($35 billion), and Egypt ($30 billion), according to the Migration Statistics Portal.

In 2020, notwithstanding the detrimental effects of COVID-19 on economies, remittance flows to low-income and low-middle-income countries are likely to surpass foreign direct investment ($258 billion) and overseas development assistance ($179 billion) (WB, 2021). Despite a global health crisis, remittances to developing countries fell by only 1.6 percent in 2020, from $548 billion in 2019 to $540 billion [11].

As COVID-19 continues to affect families around the world, remittances continue to provide an essential lifeline for the poor and vulnerable," said Michal Rutkowski, Global Director of the World Bank's Social Protection and Jobs Global Practice. He continued, "Supportive policy solutions, in conjunction with national social protection systems, should continue to be inclusive of all populations, including migrants." [11].

The persistence of remittance flows is astounding. Remittances are assisting in meeting families' rising demand for financial assistance. They can no longer be dismissed as minor adjustments. For nearly two decades, the World Bank has been tracking migration and remittance flows, and we are working with governments and partners to develop timely data and make remittance flows more productive." Dilip Ratha, the principal author of the migration and remittances report and the head of KNOMAD, made this statement (WB, 2021).

Figure 1 shows the flow of remittances, foreign direct investment (FDI), and net development assistance to sub-Saharan Africa from 2014 to 2022 with data from the World Development Indicators (WDI). The remittance flow to the region has shown less volatility over the period as compared to FDI. Despite its relatively low reduction during the pandemic from 2019 to 2020, it recovered swiftly even during the pandemic, proving its resilience amid an economic crisis.

In recent years, the planet has experienced pandemics and crises like the 2014 Ebola epidemic and the 2008 financial crisis, but the COVID-19 pandemic's scenario and ramifications are unprecedented (Bisong et al., 2020). According to Devermont (2020), the COVID-19 problem is special. It began as a health crisis and has since developed into an economic one that is disrupting financial flows, with certain countries may be also going through a political crisis[12]. The indirect economic effects of the crisis are not yet known. The current epidemic will also, according to the International Monetary Fund, produce a worldwide recession that will be much worse than the 2008 financial crisis and will be the biggest since the Great Depression (IMF 2020a).

Kitenge (2020) had predicted that African nations would experience a more severe impact from the ongoing crisis compared to previous downturns. This projection was rooted in the fact that these nations had become more deeply intertwined with the global economy through intricate value chains and financial markets. Unlike earlier crises, the COVID-19 pandemic had unfolded suddenly and unexpectedly, catching governments unprepared and limiting

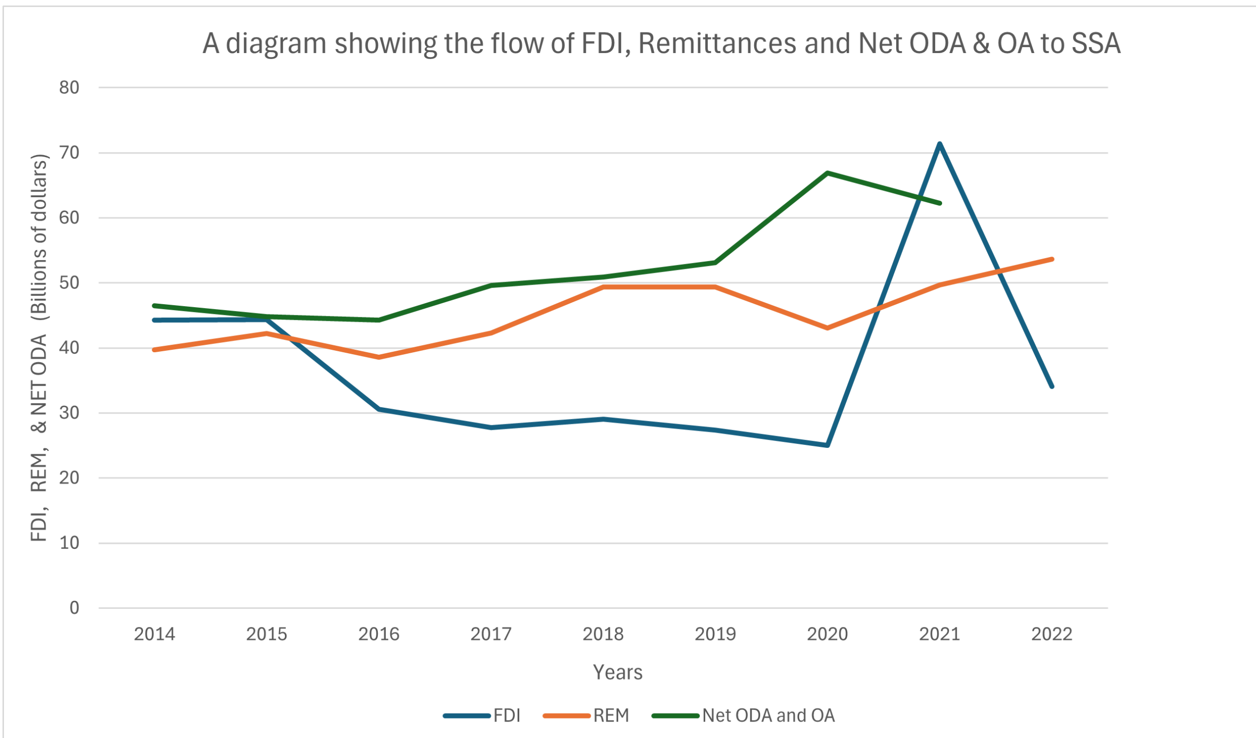
A diagram showing the flow of FDI, Remittances and Net ODA & OA to SSA
FDI, REM, & NET ODA (Billions of dollars)
80
70
60
50
40
30
20
10
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Years
FDI
REM
Net ODA and OA

Figure 1:

their ability to adequately brace for economic shutdowns[13].

As highlighted by Danielsson et al. (2020), the rapid spread of the virus to every corner of the globe had necessitated widespread lockdowns, resulting in an abrupt halt to economic activities. This sudden cessation of economic operations had posed significant challenges for businesses, households, and individuals worldwide, including those in African nations. The unprecedented nature of the pandemic and its profound impact on global economic systems had exacerbated the difficulties faced by African countries, which often lacked the resources and infrastructure to swiftly adapt to such crises[14].

Ultimately, the COVID-19 pandemic had presented unparalleled challenges for African nations, magnifying the negative economic impact due to their deep integration into the global economy and the unforeseen nature of the crisis. Addressing these challenges had required concerted efforts at both national and international levels to mitigate the economic fallout and support recovery efforts across the region.

In recent literature, various authors have examined the unique characteristics and repercussions of the COVID-19 pandemic in comparison to previous crises. Bisong et al. (2020)[15] highlighted the unprecedented nature of the COVID-19 scenario, distinguishing it from past pandemics and economic downturns such as the 2014 Ebola epidemic and the 2008 financial crisis. Additionally, Devermont (2020) [12] emphasized the distinctiveness of the COVID-19 crisis, noting its transition from a health emergency to an economic crisis, disrupting financial flows and potentially precipitating political instability in some regions.

Furthermore, the International Monetary Fund (IMF) have assessed the magnitude of the economic impact of the COVID-19 pandemic. They warned of a global recession of unprecedented scale, surpassing the severity of the 2008 financial crisis and possibly rivaling the magnitude of the Great Depression. This literature review highlights the consensus among researchers regarding the unparalleled nature of the COVID-19 crisis and the urgent need for coordinated international efforts to address its far-reaching consequences and facilitate economic recovery [16].

Indeed, declining remittance flows are exerting significant pressure on Sub-Saharan Africa's economic growth and development amid the COVID-19 pandemic. As remittances constitute a substantial source of external funding for many countries in the region, their reduction has profound implications for economic stability and household welfare. Ataguba (2020) and Damak and Bahtia (2020) have highlighted the adverse effects of low remittance flows on remittance-dependent countries in Sub-Saharan Africa[17][18].

The decrease in remittance inflows translates into diminished household incomes, thereby reducing consumption levels and undermining overall welfare. Moreover, the decline in remittances poses a risk of pushing individuals and families back into poverty, reversing years of progress in poverty alleviation efforts. The economic development effects are particularly pronounced in countries heavily reliant on remittances as a source of income and foreign exchange, exacerbating existing vulnerabilities and challenges.

In essence, the reduced flow of remittances exacerbates the economic challenges faced by Sub-Saharan African countries, exacerbating poverty, limiting economic growth prospects, and impeding progress towards development goals. Addressing the decline in remittance flows is crucial for mitigating the adverse effects on household welfare and promoting sustainable economic development in the region.

Ambrosius et al. (2023)[19] conducted a study to examine the elasticity between remittances and employment conditions for Mexican migrants, both in their home country and in the destination countries, particularly in light of the COVID-19 pandemic. Their research revealed that the economic conditions in the destination country significantly influenced migrant remittances flowing into Mexico. They observed that as economic conditions deteriorated in the destination countries, remittance levels to Mexico decreased accordingly.

The findings of Ambrosius et al.(2023) underscore the vulnerability of remittance flows to external economic shocks, such as those induced by the COVID-19 pandemic. With reductions in remittances, they noted a corresponding decrease in consumption levels within Mexico. This suggests that the economic well-being of households in the recipient country is intricately linked to the employment conditions and economic stability of migrants in the destination countries.

Overall, the study highlights the importance of understanding the dynamics of remittance flows in response to external economic factors, particularly during times of global crisis. The findings underscore the need for policies and interventions aimed at enhancing the resilience of both migrant communities and recipient economies to mitigate the adverse effects of economic downturns on remittance-dependent households[19].

2.2.4 Remittances and Economic growth

Empirical studies consistently highlight a positive association between remittances and economic expansion. When all other factors are held constant, an economy is more inclined to witness growth and development when the overall volume of remittances it receives from its citizens residing abroad is greater. This favorable association extends across various economic indicators, including consumption, savings, investment, and to some extent, the performance of the financial sector.

Remittances play a crucial role in driving economic activity by augmenting household incomes, which in turn, stimulates consumption and boosts overall demand within the economy. Additionally, remittances contribute to savings and investment, thereby fostering capital accumulation and fueling productive activities. Moreover, the injection of remittance funds into the financial system can enhance its performance, facilitating greater access to credit and promoting financial inclusion.

The empirical evidence underscores the beneficial impact of remittances on economic growth and development, highlighting their significance as a vital source of external funding that can catalyze economic expansion and improve the welfare of recipient countries.

In his work, Hugo, G. (2012)[20] proposes that migration, facilitated by remittances and other diaspora influences, could play a vital role in fostering adaptive capacity and resilience in areas impacted by climate change. He argues that rather than solely being perceived as a protective response, migration should be viewed as an active intervention to promote economic growth and development in regions grappling with climate change effects. Hugo suggests that by harnessing the potential of migration, policymakers can initiate proactive measures to bolster economic prosperity and uplift local communities in climate-affected areas. Implementing strategic migration policies, according to him, can not only assist the local population in coping with environmental challenges but also stimulate sustainable economic growth. His perspective emphasizes the transformative impact that well-managed migration can have on vulnerable regions, positioning migration as a proactive strategy for enhancing adaptive capacity and resilience in the face of climate change. By leveraging remittances and diaspora connections, migration can serve as a catalyst for economic development, ultimately improving the livelihoods of individuals and communities affected by climate-induced disruptions.

In a study by Cooray, A. (2012)[2], the impact of migrant remittances on the size and efficiency of the financial industry in 94 non-OECD countries was examined. The research findings indicated that migrant remittances contribute to the expansion and enhancement of the financial sector. Using pooled ordinary least squares (OLS) and system generalized method of moments (GMM) estimations, the study demonstrated that remittances positively influence both the size and effectiveness of the financial industry. These conclusions are consistent with previous research by Aggarwal et al. (2006), Giuliano and Ruiz-Arranz (2009), and Gupta et al. (2010), which also found a positive relationship between migrant remittances and the development of the financial sector. Furthermore, Cooray's study delved deeper into the interaction between government ownership of banks and migrant remittances. The analysis revealed that the impact of remittances on the financial system varies depending on the level of government ownership of banks. Specifically, the study found that remittances enhance the efficiency of the financial sector in countries where government ownership of banks is higher. Conversely, in countries with lower levels of government ownership of banks, remittances contribute to the expansion of the financial industry. This interaction underscores the nuanced relationship between remittances and the financial sector, highlighting the importance of considering institutional factors in understanding their impact on economic development.

Qayyum et al. (2008) conducted a study to assess the impact of remittances on economic growth and poverty reduction in Pakistan. Their investigation led them to argue that there exists a positive and significant association between worker remittances and both economic growth and poverty reduction in the country. This suggests that remittance inflows contribute not only to overall economic expansion but also to alleviating poverty by boosting household incomes and consumption levels[21]. Moreover, Ratha (2003)[22] emphasized the multiplier effect of remittances on the economy, particularly in rural areas. Rural households, which often receive a significant portion of remittance inflows, tend to spend the majority of their income on domestically produced goods and services. As a result, remittances have the potential to stimulate demand for local products, thereby generating additional economic activity and creating a ripple effect throughout the economy. Overall, the findings of both Qayyum et al. (2008) and Ratha (2003) highlight the positive role of remittances in fostering economic growth and poverty reduction in Pakistan. By injecting additional income into households, remittances not only enhance individual well-being but also contribute to broader economic development through increased consumption and investment, particularly in rural areas where remittance recipients reside.

Cooray (2012)[23] conducted an empirical study to investigate the impact of migrant remittances on economic growth in South Asia. By incorporating migrant remittances alongside other relevant factors in a growth model and utilizing panel data spanning from 1970 to 2008, the study revealed a positive and statistically significant association between migrant remittances and economic growth. Importantly, this relationship was found to be particularly robust when educational attainment levels and the expansion of the financial industry were high. Furthermore, the findings of Cooray's study were supported by several other researchers. Cox et al. (2003), Martin et al. (2007), and Ranasinghe (2007) all provided corroborating evidence for the positive impact of migrant remittances on economic growth in South Asia. This convergence of findings across multiple studies lends further credibility to the notion that migrant remittances play a beneficial role in fostering economic development in the region. The empirical evidence presented by Cooray (2012) and supported by subsequent studies underscores the importance of migrant remittances as a driver of economic growth in South Asia. These findings highlight the potential of remittances to contribute positively to various facets of economic development, particularly in contexts where educational attainment levels are high and financial markets are expanding.

Indeed, some research studies offer contradictory evidence, suggesting a potentially negative correlation between remittance inflows and economic growth. For instance, Meyer and Shera (2017)[24] conducted empirical analysis supporting the theory that remittances can lead to a phenomenon known as "Dutch disease." This condition occurs when an increase in remittances prevents or delays a currency's depreciation, potentially slowing down economic growth. In essence, if remittance inflows are substantial enough to cause the exchange rate to appreciate, they can hinder economic expansion.

Moreover, research by Chami and Jahja (2003) has highlighted the adverse impact of remittances from migrant workers on per capita income growth. They observed that a significant portion, often the majority, of remittances is directed towards consumption rather than saving or investment. Furthermore, they argued that the methods typically employed for saving and investing remittances are not sufficiently productive for the overall economy. Consequently, the reliance on remittances for consumption rather than productive investment may limit the potential for economic growth in the long term [25].

These findings present a contrasting perspective on the role of remittances in economic development, suggesting that while they may provide immediate relief to recipient households, their long-term impact on economic growth could be constrained by factors such as exchange rate dynamics and allocation towards consumption rather than investment. As such, policymakers and researchers should carefully consider the potential trade-offs associated with remittance inflows when formulating strategies for economic development in recipient countries.

3 Methodology

3.1 Data

This study uses a quarterly panel data set consisting of 60 developing countries from the period 2016 to 2023. The countries were chosen based on their availability. Data on consumption, GDP growth rate, remittances, unemployment, population, and other control variables are sourced from the World Development Indicators (WDI), FRED, and other sources. A dummy variable is used to account for the COVID-19 pandemic, where 1 indicates the period when COVID was present (2020–2023) and zero otherwise (2016–2019).

3.2 Explanation of Variables

3.2.1 Dependent Variable

Consumption: This term refers to the total quantity of goods and services consumed within a country. It encompasses both durable items, such as cars and appliances, and non-durable goods, like food and clothing, as well as services. In this study, the focus is specifically on consumption expenditures related to non-durable goods and services. This distinction allows for a more targeted analysis of the immediate spending patterns and consumption behavior of households, particularly in relation to factors such as migrant remittances and their impact on consumption smoothing.

3.2.2 Explanatory Variable

Remittances (REM): This is the main regressor for this research. The study followed the World Bank's lead and defined this variable as the total of worker remittances and employee remuneration. According to Bugamelli and Paterno (2009)[26], the sum of these two variables because of the statistical difference between the two might be difficult for many poor nations. Dilip Ratha of the World Bank stipulated those workers or migrant remittances are made when migrants return home a portion of their earnings in the form of cash or products to assist their family. He emphasized that because many remittances are sent through unauthorized routes, it is difficult to assess their exact size.

Remittance flows are steadier than capital flows, and they are counter cyclical, rising during recessions or after natural disasters, while private capital flows are falling. They are typically an economic lifeline for the impoverished in nations where political strife exists. Remittances are expressed as a ratio of remittances to GDP. Being more emphatic, I expect the current pandemic to have a negative impact on the transfer of migrants' remittances, causing a reduction in remittances to result in lower levels of economic growth across developing countries. This preliminary expectation is due to the long periods of lockdowns which led to high rates of unemployment and a reduction in productivity in host countries.

3.2.3 Control Variables

1. **GDP growth rate (GDP)**: In this research, the GDP growth rate is used to gauge economic expansion. A common way to determine the value of the final commodities and services produced by a nation over time is to use its gross domestic product (GDP) (OECD, 2009). Specifically, citizens of a nation produce goods and services. Data on the GDP growth rate will be sourced from the World Development Indicators (WDI).

2. **Unemployment**: The International Labor Organization (ILO) defines unemployment as the percentage of people of working age who are either employed or jobless compared to those who are neither working nor actively looking for work (aged 15 to 64). Unemployment hampers the economies of both developed and developing nations. The economic growth of a nation with a higher unemployment rate will be significantly slower.

3. **Terms of Trade**: The terms of trade are the proportion between the export and import price indices. When export prices increase more rapidly than import prices, a country's terms of trade improve because it can purchase more imports for every export. On the GDP growth rate, this variable is anticipated to have a favorable effect.

4. **Population growth rate**: Population, according to the World Bank, is the total number of people inhabiting a country, regardless of their nationality or legal standing. An increase in population is idealistically anticipated to have a beneficial impact on economic growth because it expands the labor force in the nation. It is determined as the percentage difference between the population of the current period and the population of the previous period.

5. **Net Official Domestic Assistance**: The World Bank defines it as the disbursements of grants and concessional loans (net of principal repayments) made by official organizations of DAC members, multilateral organizations, and non-DAC countries

to advance economic development and welfare in nations and territories on the DAC list of ODA recipients. It includes loans having a minimum grant component of 25% which is estimated at a 10% discount rate. This variable is anticipated to increase aggregate consumption; hence, it is anticipated to have a positive coefficient.

6. **Foreign Direct Investment**: The World Bank defines them as the net inflows of capital used to create a long-term management holding with 10% or more voting shares in an organization that conducts business outside of the investor's home country. It is also the sum of equity capital, reinvestment of earnings other than long-term capital, and short-term capital, as shown by the balance of payments. However, FDI does not give a complete picture of foreign investment in each economy. It is anticipated that the coefficient will be positive.

3.3 Model Specification

The model below is used to assess the impact of remittances on consumption smoothing during the COVID-19 pandemic.Three models are considered in my investigation, in addition to random-effects and fixed-effects Ordinary Least Squares (OLS) models . To specific, we first of all consider average effect of remittances on consumption from 2016 to 2023. Then we assess this effect for the period prior to the health pandemic, thus from 2016 to 2019, and the period after the emergence of the pandemic i.e 2020 to 2023.

3.3.1 main model

$$\Delta lnC_{i,t} = \alpha_0 + \alpha_1 lnREM_{i,t} + \alpha_3 COVID * lnREM_{i,t} + \phi' Z_{i,t} + \eta_i + \gamma_t + \epsilon_{i,t} \ldots\ldots (1)$$

Where $C_{i,t}$ is consumption of non-durable goods, $REM_{i,t}$ is remittance flows (as a share of GDP), COVID is a dummy variable for the COVID-19 pandemic, $Z_{i,t}$ denotes a matrix for controlled variables, η_i represents country fixed effects, and γ_t represents year fixed effects. Whilst $Z_{i,t}$ controls for common shocks at each period among countries in the sample, and $\epsilon_{i,t}$ is the error term.

H_0 : Remittances have a significant effect on consumption growth respective of the presence of the global health pandemic.

In order to address the issue of endogeneity in the remittance variable, the study adopts the use of instrumental variable by employing 2sls estimation approach. The instrument considered in this research is the average cost of remittance ($ACR_{i,t}$) to the selected developing countries [27][28]. This variable satisfies all the conditions for a valid instruments; it has a significant impact on remittance sent and it is exogenous to economic growth.

3.3.2 DAG's

$$\begin{tikzcd}
& & A_{it} \arrow[dl, dashed] \arrow[d, dashed] \\
ACR_{i,t} \arrow[r] & REM_{i,t} \arrow[r] & C_{i,t} \\
& \boxed{X_{i,t}} \arrow[u] \arrow[ur] &
\end{tikzcd}$$

The diagram above presents a graphical representation of the relationships between the variables considered in this study. From the diagram, $X_{i,t}$ is a known confounder that represents any factor that could affect both explanatory variable ($REM_{i,t}$) and the dependent variable ($C_{i,t}$) like unemployment, which could cause our estimates to bias.If this issue is not addressed, their will be a correlation between $REM_{i,t}$ and the error term ($\epsilon_{i,t}$) which will lead to an endogeneity problem due to omitted variable bias. To correct this, I introduce an instrumental variable ($ACR_{i,t}$) which can only influence $C_{i,t}$ through $REM_{i,t}$, and it is as good as random because it is determined by the demand and supply of remittances. $A_{i,t}$ is an unknown confounder, like family investment or the innate ability of the populace, which represents any unobserved factors.

3.3.3 first-stage regression

$$lnREM_{i,t} = \beta_0 + \beta_1 lnACR_{i,t} + \eta_i + \gamma_t + \nu_{i,t} \ldots\ldots\ldots (2)$$

The first-stage regression allows us to obtain the predicted values for the explanatory variable ($REM_{i,t}$), which helps eliminates the endogenous part of $REM_{i,t}$.

3.3.4 second-stage regression

$$\Delta lnC_{i,t} = \alpha_0 + \alpha_1 lnREM_{i,t} + \alpha_3 COVID * lnREM_{i,t} + \phi' Z_{i,t} + \eta_i + \gamma_t + \epsilon_{i,t} \ldots\ldots (3)$$

Here, we run the main model using the predicted values of remittances, $REM_{i,t}$ as the explanatory variable and $GDP_{i,t}$ as the dependent variable. The estimates from this model are not biased because the issue of endogeneity has been eradicated by using the predicted values of the remittance variable.

4 Conclusion & Policy Implication

The impact of migrant remittances on consumption smoothing is a significant subject within developmental studies. This study seeks to examine this phenomenon in the context of the COVID-19 pandemic. While previous research, such as that by Combes and Ebeke (2011), has explored similar topics in the presence of aggregate shocks, the unique nature of the COVID-19 shock, affecting both migrant-sending and migrant-receiving countries, emphasizes the importance of investigating its effects.

Given the detrimental effects of this recent global pandemic, like long periods of lockdown, it is expected that the effect of remittances will dwindle amid the pandemic, which is in line with the results found in Ambrosius et al. (2023)[19].

The findings of this study will be compared to those of Broda and Parker (2014), Parker (1999), and Shapiro and Slemrod (2003, 2009) to ascertain whether the influence of remittances on consumption in developing countries aligns with the impact of government tax bonuses on consumption in developed nations. This comparative analysis aims to shed light on the similarities or differences in consumption behavior across different economic contexts and the role of remittances in shaping household consumption patterns.

The policy implications of this research are significant in informing policymakers, migrant recipients, and other stakeholders about the importance of remittances to developing and emerging economies. By establishing the crucial role of remittances in fostering economic development, this study underscores the need for implementing policies aimed at reducing transaction costs and ensuring the smooth and efficient transfer of migrant remittances to developing nations.

Policymakers in developing countries can use the evidence provided by this research to design and implement policies that facilitate the inflow of remittances and maximize their impact on economic growth and poverty reduction. Measures such as reducing remittance transfer fees, improving access to financial services for remittance recipients, and promoting financial literacy among migrant populations can enhance the effectiveness of remittance flows.

Similarly, migrant recipients can benefit from understanding the significance of remittances and the potential positive effects on their communities and countries of origin. This knowledge can empower them to make informed decisions regarding remittance sending methods and encourage them to explore options that minimize costs and maximize the value of their remittances.

All in all, the findings of this research will emphasize the importance of policy interventions aimed at creating an enabling environment for remittance flows. By implementing measures to lower transaction costs and enhance the efficiency of remittance transfers, policymakers, migrant recipients, and other stakeholders can contribute to sustainable economic development and poverty alleviation in developing nations.

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