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Analyzing the impact of remittance inflows on Tanzania's social development and economic growth

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ABSTRACT

This journal article analyses the impact of remittance (REM) inflows on Tanzania's social development and economic growth (Egrow) spanning from 1990 to 2022 data from the World Bank (WB), International Monetary Fund (IMF) and World Economic Outlook (WEO) were used. The purpose of this article was to measure the relationship between EGrow and REM by using the following variables: Investment (INV), Population growth (POP Grow), Exchange rate (EXCHR), Government Expenditure (GOVEXP) and Inflation (INFL). The study aimed to examine the impact of these factors on REMs on the EGrow concept by integrating it into REM studies in Tanzania. The selected factors on REMs have not been included in most REM studies conducted in Tanzania; thus, their inclusion in the study expands our knowledge of REM utilization in Tanzania. Utilizing the Fourier Stationarity Test and applying the general to a specific technique, this research findings unveil REMs' positive and notable impact on Tanzania's EGrow. Additionally, POP Grow, INV, EXCHR, GOVEXP and INFL exert a robust and substantial influence on REM. In conclusion, the empirical findings underscore the pivotal role of REMs in driving EGrow in Tanzania. The journal article recommended that decision-makers create proactive measures to encourage REM inflows.

IMPACT STATEMENT

This study investigates the dramatic impact of remittance inflows on Tanzania's socioeconomic environment between 1990 and 2022. The study examines the complex relationship between remittances and key economic indicators such as investment, population growth, exchange rates, government spending, and inflation by combining data from reputable sources such as the World Bank, International Monetary Fund, and World Economic Outlook. By include these variables in the research, the study not only improves our understanding of remittance dynamics, but also sheds light on hitherto unknown aspects of their impact on Tanzanian economic growth. The findings show a significant and positive relationship between remittance inflows and economic progress, highlighting remittances' critical role in driving Tanzania's growth trajectory. Furthermore, the study reveals the subtle linkages between remittances and other socioeconomic indicators, revealing their strong and significant impact on one another. This detailed analysis not only contributes to the academic conversation on remittances, but it also recommends policymakers to focus more on policies that encourage the diaspora to contribute to the country's development. In this sense, the government should devise novel strategies to capture the diaspora's funds. The study emphasizes the need of taking proactive efforts to promote and exploit remittance inflows for Tanzania's long-term socioeconomic growth.

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1. Introduction

Remittances (REMs), or money transfers to migrants' home countries, have increased significantly due to the significant growth in worldwide migration in recent decades. According to World Bank (WB) data from 2023, REMs are increasing globally when only formally documented transfers are considered. In particular, REMs to South Asia increased by 7.2% in 2023 to a significant $189 billion; however, this

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development trend appeared to be leveling off from the nearly 12% increase recorded in 2022. REM flows were projected to have climbed by almost 1.9% in 2023, totaling $54 billion, for Sub-Saharan Africa. According to projections, REM flows to the area are expected to rise by an additional 2.5% in 2024. An overall improvement in REM flows is predicted for the same year, 2024, with a projected rise of 2.1%, mostly due to an anticipated reversal in flows to Egypt.

Regarding Latin America and the Caribbean, REM flows are anticipated to increase by 8% and reach $156 billion by 2023. A 3% rise in REMs to East Asia and the Pacific, totaling $133 billion, is anticipated in 2023. It is projected that REMs to low- and middle-income countries (LMICs) will total $669 billion in 2023. The dynamic character of REM patterns is highlighted by these numbers, which show differences in regional economic conditions and the global migration increase.

Hence, the nexus between migrant REMs and economic growth (Egrow) has been a subject of substantial and persistent interest. Nevertheless, both theoretical and empirical investigations have yielded conflicting conclusions, preventing the establishment of a consensus on the impact of this relationship. Scholars, such as Ali Bare et al. (2022) and Tchekoumi and Nya (2023) assert a positive influence of REMs on EGrow, attributing this positive coefficient to stable policy environments. Rehman and Hysa (2021), employing financial development as a regressor, also discovered a positive correlation between REMs and EGrow. In a distinct vein, Abdulai (2023) suggests that the impact of REMs on EGrow is more pronounced in Ghana. Prempeh et al. (2023) establish that REMs conditionally foster growth in nations boasting developed financial systems and robust institutional environments, focusing on Ghana. Makina (2024) found a positive relationship between household consumption and REM in Lesotho, which portrayed that the more REM received, the lower the household consumption. A similar study conducted by Nikšić Radić et al. (2023) in bibliometric found that it depends on the income level of a certain country; REM also influences positively EGrow. Saani et al. (2023) employed the ARDL method in data analysis and found that REM increases female unemployment in Ghana. Other scholars who found positive impacts on REM and EGrow were (Aslam et al., 2023 Barkat et al., 2023 Chen et al., 2023; Golder et al., 2023; Khan, 2023; Sutradhar, 2020). The synthesis of these findings highlights the complexity of the REM-EGrow relationship, with contextual factors, such as policy stability, financial development and institutional strength playing crucial roles. Consequently, the conclusion for the authors should acknowledge the diversity of outcomes and call for nuanced considerations of specific country contexts and the interplay of various factors in understanding the ramifications of REMs on EGrow.

Conversely, Bajra (2021) and Al-Malki et al. (2022) present findings indicating a negative association between REMs and EGrow. They argue that REMs significantly diminish the labor effort of recipient households. However, this study faces criticism for not considering the endogenous nature of REMs, as Saani et al. (2023) pointed out. Similarly, Ofori et al. (2023) discovered a negative impact of REMs on EGrow. Additionally, Alsamara and Mrabet (2023) contend that the influx of REMs can lead to a real appreciation of the exchange rate (EXCHR), negatively affecting exports and potentially reducing trade openness, thereby impeding overall EGrow. Cazachevici et al. (2020) found that REM does not influence African EGrow while conducting a meta-analysis study. To contribute to the ongoing debate, this article suggests an empirical examination of the actual impact of REMs on EGrow. This is in line with Padhan et al. (2023), who posit a non-linear relationship between these variables, and Gapen et al. (2009), who propose no positive impact between workers' REM and EGrow.

This study aims to contribute significantly to the empirical literature on the connection between migrant REMs and EGrow. Previous empirical research has indicated an uncertain or conflicting relationship and several factors may explain these divergent results. One factor is the omission of certain variables in the selection process (Adugna Chomen et al., 2023). Additionally, the broad scope of studies that amalgamate diverse countries without considering their specific characteristics may contribute to inconsistent findings (Matuzeviciute & Butkus, 2016). Such studies often overlook robustness tests that could highlight the influence of sub-regional membership, for instance.

Moreover, there is merit in concentrating on one, given that such a goal necessitates not only a uniform policy but also a politically and economically stable institution. Lastly, the economic theory on EGrow is outdated, leading empirical studies to reflect the gaps in this theoretical framework. To address these issues, this research delves into the Fourier Stationarity Test of the relationship between migrant REMs and EGrow in Tanzania. Furthermore, this study opts for a sample of one country, Tanzania,

covering the period from 1990 to 2022. The findings of this research indicate a positive significant relationship between migrant REMs and EGrow in Tanzania.

The structure of this article is organized as follows: Section 2 provides a literature review, Section 3 outlines the methodological framework, Section 4 presents and discusses the results and finally, Section 5 concludes the study.

2. Literature review

Given the importance of REMs in international migration, assessing their impact on economic dynamics within Tanzania is critical. One important strategy is examining how REMs affect the recipient country's EGrow. The question remains: can REMs solve Tanzania's longstanding problem of low EGrow? Existing literature offers various opinions on how REMs influence recipient countries' EGrow. On the one hand, some academics, such as Fleming et al. (2017), Getish et al. (2020), Islam (2022), Matuzeviciute and Butkus (2016), Nikšić Radić et al. (2023), Ofori and Grechyna (2021) and Zahra et al. (2007) claim that migrant REMs boost growth in receiving economies. Researchers, such as Umair et al. (2023), Sutradhar (2020), Tchekoumi and Nya (2023), Adugna Chomen et al. (2023) and Abdulai (2023), on the other hand, emphasize the negative consequences of REMs, claiming that they do not lead to positive EGrow due to a negative correlation between the two variables. According to them, there is no link between REMs and EGrow in these countries. The available theoretical literature detailing the many mechanisms *via* which REMs influence EGrow influences these contradictory empirical findings about the growth effects of REMs to some extent.

Two main schools of thought have formed within the large body of literature regarding the growth effects of REMs: the migration pessimists and the migration optimists. The migration pessimists argue that REMs either have no effect on EGrow or have negative growth effects. In contrast, migration optimists present arguments in favor of the positive growth effects of REMs, highlighting indirect growth pathways through economic channels, such as increased savings, investment (INV) capital, human capital INVs, additional employment and the broader multiplier effects of consumption on aggregate demand and output. They contend that contrary to the migration optimists' claims, REMs are typically used for consumption rather than profitable INVs. Both schools of thought give opposing evidence addressing the growth effects of REMs through similar pathways, including consumption, human capital INV and labour supply. Given the disputed character of the material, reaching a firm judgment about the growth effects of REMs in Tanzania is difficult (Magai, 2020). As a result, it is critical to investigate the growth effects of REMs and answer the following research question: How do REMs impact the EGrow of receiving countries like Tanzania?

The primary motivation for concentrating on the effects of REM inflows on social and economic development in Tanzania is the dearth of empirical knowledge and practitioner understanding regarding the relationship between REMs and economic development, inconsistent findings from earlier research and low-level records of emigrant inflows into Tanzania due to data shortages. Furthermore, there are a few published studies and data regarding the effect of REM inflows on Tanzania's social and economic development. The journal article's weak methodology, absence of multivariate analysis and sparse use of the Fourier in prior research on the impact of REM inflows on social and economic development in Tanzania are all excuses. But the Fourier Causality test has been applied in different contexts by numerous earlier studies (Aydin & Bozatli, 2023; David et al., 2023; Genç et al., 2022; Qamruzzaman, 2023). The subsequent paragraphs address a more thorough examination of these arguments.

Currently, no study has considered every factor that was chosen (government expenditure [GOVEXP], EXCHRs, population growth [POP Grow], INV, REMs and EGrow). This brings up the main topic of this journal article, which is whether these elements comprehensively impact Tanzania's EGrow about REMs within a single research framework. In general, the majority of studies have focused on EGrow as the dependent (Adebayo et al., 2023; Adugna Chomen et al., 2023; Genevieve et al., 2023; Khan, 2023; Mamun & Kabir, 2023; Ofori et al., 2023; Padhan et al., 2023; Tabash et al., 2023; Tchekoumi & Nya, 2023; Umair et al., 2023). Furthermore, there is not much research that has focused on or studied REM in Tanzania (Eghan, 2022; Hansen, 2010, 2012; Isoto & Kraybill, 2017; Magai, 2020; Musakwa & Odhiambo, 2022; Porter, 1980).

Additionally, earlier research in this field was carried out in South Asia (Islam, 2022), Croatia (Depken et al., 2021), the UE countries (Golder et al., 2023; Mamun & Kabir, 2023; Soava et al., 2020), Asia (Tabash et al., 2023), Mexico, Indonesia, Nigeria and Turkey (Odugbesan et al., 2021), Africa (Genevieve et al., 2023), Organization of Islamic Cooperation (OIC) member (Kamalu et al., 2022), CEMAC zone (Tchekoumi & Nya, 2023), Pakistan (Abduvaliev & Bustillo, 2020; Mazher et al., 2020) Sri-Lanka (Aslam et al., 2023), India (Jayaraman & Makun, 2022; Khan, 2023), Bangladesh, India, Pakistan and Sri Lanka (Sutradhar, 2020), Sub- Saharan Africa (Adugna Chomen et al., 2023; Ofori & Grechyna, 2021), Guyana (Kumar, 2013), Gulf Cooperation Council (GCC) region (Al-Malki et al., 2022; Alsamara & Mrabet, 2023). Therefore, this study is timely and appropriate for the least developing nations like Tanzania.

Few studies have looked at the factors influencing EGrow through REM inflows in developing nations (Barkat et al., 2023; Chen et al., 2023; Djeunankan et al., 2023; Eggoh et al., 2019), while the majority of previous studies examined factors like EGrow, REM, INV, POP Grow, EXCHR and GOVEXP that influence EGrow through REM inflows in developed and developing countries (e.g. GCC Region, Bangladesh, Sri-Lanka, India and Pakistan,). Additionally, studies that included EXCHR (Genevieve et al., 2023; Magai, 2020), population-growth and GOVEXP (Genevieve et al., 2023), GOVEXP, inflation (INFL) and POP Grow (Ibrahim, 2022), INV (Getish et al., 2020; Kamalu et al., 2022).

Similar to this, there EGrow through REM inflows. These factors include financial development (Chiwira, 2023; Ofori et al., 2023; Sidi & Meky, 2023) tourism, foreign direct INV (FDI) (Epaphra, 2016; Mwakabungu & Kauangal, 2023; Tabash et al., 2023; Waqas & Awan, 2023), renewable energy (Aydin & Bozatli, 2023) external debt (Jilenga et al., 2016; Kasidi & Said, 2013), outward FDI (Osarumwense & Igor, 2023), technological transfer (Osarumwense & Igor, 2023), industrialization (Lugina et al., 2022), natural resource (Ofori & Grechyna, 2021), agriculture (Epaphra & Mwakalasya, 2017; Lawal, 2022), tourism (Odhiambo, 2011), poverty (Musakwa & Odhiambo, 2022), trade openness (Asamoah et al., 2019), risk (Lumbila, 2016), innovation (Mtar & Belazreg, 2021), REM outflows (Al-Malki et al., 2022), exports (Ahmad et al., 2018) and digital financial inclusion (Chinoda & Kapingura, 2023).

Nevertheless, the evidence is inconsistent regarding the other factors financial development, tourism, FDI, renewable energy, technological transfer and natural resources can affect EGrow through REM inflows (Aydin & Bozatli, 2023; Chiwira, 2023; Depken et al., 2021; Epaphra, 2016; Gapen et al., 2009; Ibrahim, 2022; Mwakabungu & Kauangal, 2023; Nikšić Radić et al., 2023; Ofori et al., 2023; Salahuddin & Gow, 2015; Sidi & Meky, 2023; Tabash et al., 2023; Waqas & Awan, 2023). Additional factors, such as outward FDI, external debt, poverty, trade openness, risk, exports and digital financial inclusion, have also been found to affect EGrow through REM (Ahmad et al., 2018; Asamoah et al., 2019; Chinoda & Kapingura, 2023; Jilenga et al., 2016; Kasidi & Said, 2013; Lumbila, 2016; Mtar & Belazreg, 2021; Musakwa & Odhiambo, 2022; Osarumwense & Igor, 2023). Furthermore, most of these studies have been conducted in other nations and advanced economies.

Additionally, the results of studies on the factors influencing EGrow through REM inflows could be more consistent. For example, some studies are found to be positively significant (Abdulai, 2023; Abduvaliev & Bustillo, 2020; Adugna Chomen et al., 2023; Aslam et al., 2023; Fleming et al., 2017; Genevieve et al., 2023; Getish et al., 2020; Golder et al., 2023; Isoto & Kraybill, 2017; Khan, 2023; Magai, 2020; Mamun & Kabir, 2023; Musakwa & Odhiambo, 2022; Odugbesan et al., 2021; Peprah et al., 2019; Tchekoumi & Nya, 2023) and negatively significant in other (Cazachevici et al., 2020; Depken et al., 2021; Eggoh et al., 2019; Eghan, 2022; Islam, 2022; Jayaraman & Makun, 2022; Ofori et al., 2023; Ofori & Grechyna, 2021; Soava et al., 2020; Sutradhar, 2020). More studies have been made possible because the earlier studies had inconsistent results, some good and some negative and some that showed no association.

Furthermore, empirical studies have not examined the reasons behind Tanzania's low REM record level (Magai, 2020). Neither research has provided evidence for the rationale behind Tanzania's low REM record level, which led to the focus of this journal article on determining whether these factors influence EGrow through REM inflows in Tanzania holistically in one research framework through the Fourier Stationarity test.

Furthermore, the Fourier Model must be utilized more when influencing EGrow through REM inflows (David et al., 2023; Genevieve et al., 2023). However, only a small number of earlier studies in other fields, including carbon emissions (Genç et al., 2022), refugees and renewable energy (Aydin & Bozatli, 2023) and economic policy (Qamruzzaman, 2023). Therefore, using this Fourier stationarity test in Tanzania's EGrow through REM inflows is important.

Figure 1 shows the trends and variations in these three types of inflows over the specified years, providing valuable information about Tanzania's economic relationships with both its diaspora and foreign entities. Figure 1 shows a consistent upward trend in REM flows to Tanzania. Since 1990, REMs have steadily increased, showcasing a growing influx of funds from Tanzanians living abroad to their home country. Notably, the figures demonstrate that REM flows have expanded to the extent that they now exceed the official development assistance (ODA) received by Tanzania. This suggests a significant economic impact from REMs, surpassing the traditional financial aid provided through ODA. The consistent rise in REM flows showcases the importance of these contributions to Tanzania's economy, underlining their role in the country's financial landscape.

Figure 2 represents graphical representation of data set in Tanzania.

Based on the aforementioned examination, it is evident that numerous pieces of reviewed literature still need to offer a definitive conclusion regarding the precise impact of REM inflows on the EGrow of nations. Furthermore, the influence of REMs on growth varies across different countries, making it inappropriate to generalize findings from such studies. Hence, it is necessary to undertake a study focusing on Tanzania as a case study to provide more context-specific insights.

3. Research methodology

This study's objective was to perform thorough empirical research to clarify Tanzania's relationship between EGrow and REM inflow from 1990 to 2022. The WB, International Monetary Fund (IMF) and

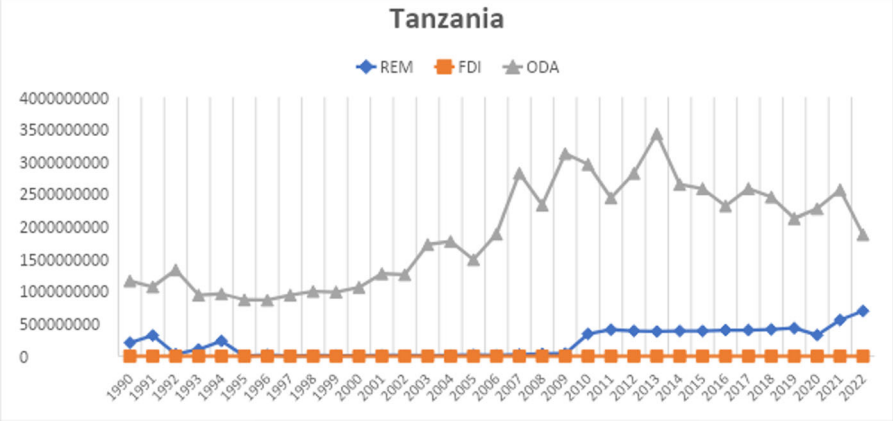

Figure 1. Remittances, foreign direct investment and official development assistance inflows to Tanzania. Source: IMF, World Economic Outlook, October 2023.

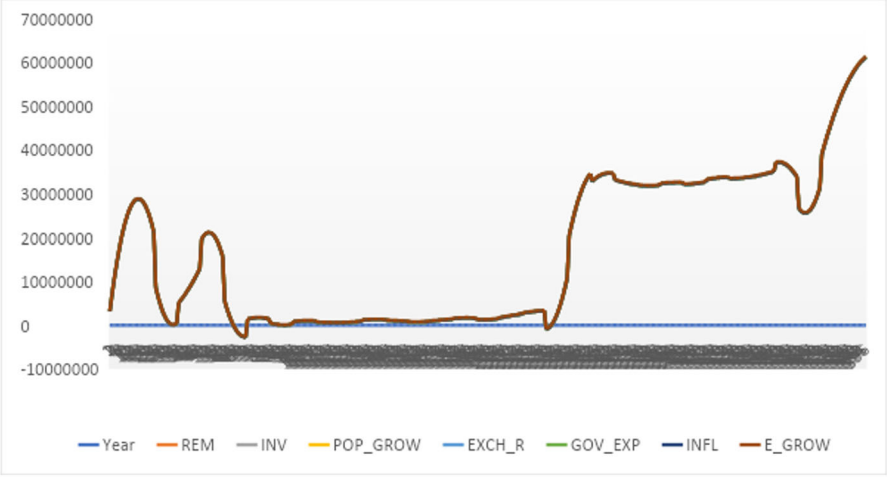

Figure 2. Graphical representation of data set.

World Economic Outlook (WEO) 2023 provided the statistics. We sought to identify patterns, trends and possible causal relationships between Tanzania's overall EGrow and REM inflows by analyzing this relationship over a sizable period. The test for Fourier stationarity was employed. Stata was used to examine the data. I first specify a simple double log-linear Cobb-Douglass production function as:

$$\ln GDPt = \alpha + \beta 1 \ln REMt + \beta 2 \ln INVt + \beta 3 \ln EXCH\_R\ t + \beta 4 \ln INFLt + \beta 5 \ln GOVEXP + \beta 6 \ln POP\ GROW + \varepsilon t \quad (1)$$

4. Presentations and discussions of the results

Table 1 shows EGrow: measuring unit: Percentage (%) EGrow is represented as a percentage of the Gross Domestic Product (GDP), indicating the rate at which the economy has expanded. REM: measuring unit: US Dollars (US$). REM is measured in the current value of US dollars, representing the funds transferred from individuals working abroad to their home country. INV: measuring unit: Local Currency (e.g. Tanzanian Shillings [TZS]). INV is measured in the current value of the local currency, reflecting the amount of money invested within the country. POP Grow: measuring unit: Percentage (%) POP Grow is represented as a percentage, illustrating the annual growth rate of the population. EXCHR: Measuring unit: US Dollars (US$). The EXCHR is represented in US dollars, showing the value of the local currency compared to the US dollar. GOVEXP: measuring unit: Percentage (%). GOVEXP is a percentage of the GDP, indicating the portion of the GDP spent by the government. INFL: unit of measurement: Percentage (%): The annual rate at which the average level of prices for goods and services is rising and, as a result, the purchasing power of currency is declining, known as INFL.

Table 2 shows descriptive statistics that offer a comprehensive overview of the distribution's central tendency, dispersion and shape across seven variables: REM, E_GROW, EXCH_R, GOV_EXP, INFL, INV and POP_GROW. This relatively low figure in Table 2 indicates that REMs contribute marginally to the country's growth even in the recent high emigration rates.

4.1. Unit-root test results

Several economic variables were tested for stationarity using a Fisher-type unit-root test. For each variable under various test circumstances, including inverse chi-squared (24), inverse normal Z, inverse logit *t* (64), L* and modified inverse chi-squared Pm, the table displays the test statistics and associated *p* values.

Table 1. Variables and measuring units.

Sr. No	Variable names	Abbreviations	Measuring unit
1	Economic growth	EGrow	As % of GDP
2	Remittance	REM	In current US$
3	Investment	INV	In the current local currency
4	Population growth	POP Grow	As annual %
5	Exchange rate	EXCHR	In current US$
6	Government expenditure	GOVEXP	As % of GDP
7	Inflation	INFL	As annual %

Table 2. Descriptive statistics.

	REM	E_GROW	EXCH_R	GOV_EXP	INFL	INV	POP_GROW
Mean	1403586	10117.17	8.470821	0.076857	0.080459	0.214727	0.019832
Median	728727	9669.877	8.231263	0.069486	0.046351	0.221917	0.019501
Maximum	5101953	14728.74	17.18832	0.137748	0.272069	0.282174	0.027416
Minimum	−225686.1	6947.593	1.338334	0.053247	0.022109	0.117051	0.011875
Std. Dev.	1414594	2675.284	4.555838	0.024625	0.065084	0.043622	0.002697
Skewness	0.522076	0.353778	0.27748	1.312863	1.286504	−0.405934	0.065167
Kurtosis	2.053411	1.624953	1.970881	3.626357	3.464129	2.131054	4.233944
Jarque-Bera	32.77372	39.45793	22.5566	120.2316	112.7905	23.33423	25.40347
Probability	0	0	0.000013	0	0	0.000009	0.000003
Sum	5.56E + 08	4006398	3354.445	30.43535	31.86188	85.03192	7.853665
Sum Sq. Dev.	7.90E + 14	2.83E + 09	8198.487	0.239528	1.673215	0.751629	0.002873
Observations	396	396	396	396	396	396	396

Note. REM: remittance; Egrow: economic growth; EXCHR: exchange rate; GOVEXP: government expenditure; INFL: inflation; INV: investment; POP Grow: population growth rate

Table 3 results indicate that for variables, such as REM, economic growth (E_GROW), INFL and population growth rate (POP_GROW), the null hypothesis of a unit root is rejected, suggesting stationarity. Conversely, variables like exchange rate (EXCH_R), government expenditure (GOV_EXP) and INV do not provide sufficient evidence to reject the null hypothesis, implying potential non-stationarity in these cases.

4.2. Cointegration test

Panel cointegration test results: Table 4 presents the results of the xtcointtest for panel cointegration among REM, E_GROW (economic growth), EXCH_R (exchange rate), GOV_EXP (government expenditure), INFL, INV and POP_GROW (population growth rate). The panel cointegration tests employ various Dickey–Fuller and Augmented Dickey–Fuller statistics. This is indicated in Table 4:

Table 4 represents results that collectively suggest significant evidence in favor of panel cointegration among the considered economic variables.

4.3. Dynamic ordinary least squares (DOLS) panel data estimation

The associations between the variables INV, POP_GROW (population growth), GOV_EXP (government expenditure), INFL and E_GROW (economic growth) were evaluated using the dynamic ordinary least squares (DOLS) panel data estimate technique shown in Table 5:

In Table 5, the results suggest that INV, POP Grow, GOVEXP, INFL and EGrow are statistically significant predictors in the model.

4.4. Fully modified OLS (FMOLS) panel data estimation

The fully modified OLS (FMOLS) panel data estimation was performed to examine the relationships between the variables INV, EXCH_R (exchange rate), POP_GROW (population growth), GOV_EXP (government expenditure), INFL and E_GROW (economic growth). This is represented in Table 6:

Table 3. Fisher-type unit-root test.

Variable	Inverse chi-squared (24)		Inverse normal *Z*		Inverse logit *t* (64) L*		Modified inv. chi-squared Pm	
	Statistic	*p* Value	Statistic	*p* Value	Statistic	*p* Value	Statistic	*p* Value
REM	3.2582	1.0000	4.0297	1.0000	3.8104	0.9998	−2.9938	0.9986
E_GROW	0.0249	1.0000	10.6671	1.0000	13.2264	1.0000	−3.4605	0.9997
EXCH_R	15.2294	0.9139	0.3083	0.6211	0.2757	0.6082	−1.2659	0.8972
GOV_EXP	25.2762	0.3909	−1.2888	0.0987	−1.1575	0.1257	0.1842	0.4269
INFL	63.0172	0.0000	−5.0269	0.0000	−4.9011	0.0000	5.6316	0.0000
INV	8.9190	0.9978	1.7505	0.9600	1.5756	0.9400	−2.1768	0.9853
POP_GROW	70.5215	0.0000	−5.5982	0.0000	−5.5513	0.0000	6.7148	0.0000

Note. REM: remittance; Egrow: economic growth; EXCHR: exchange rate; GOVEXP: government expenditure; INFL: inflation; INV: investment; POP Grow: population growth rate

Table 4. xtcointtest Kao REM, E_GROW, EXCH_R, GOV_EXP, INFL, INV and POP_GROW.

	Statistic	*p* Value
Modified Dickey–Fuller *t*	−14.6693	0.0000
Dickey–Fuller *t*	−7.5046	0.0000
Augmented Dickey–Fuller *t*	−6.9432	0.0000
Unadjusted modified Dickey–Fuller *t*	−17.1643	0.0000
Unadjusted Dickey–Fuller *t*	−7.8089	0.0000

Table 5. xtdolshm.

	Coefficient	Std. err	*z*	*p* > *z*	[95% conf	Interval]
INV	−5961980	973,558.7	−6.12	0.000	−7,870,120	−4,053,840
POP_GROW	4.28e + 07	7,036,243	6.08	0.000	2.90e + 07	5.66e + 07
GOV_EXP	−4.92e + 07	1,215,587	−40.45	0.000	−5.15e + 07	−4.68e + 07
INFL	2.18e + 07	424,541.7	51.25	0.000	2.09e + 07	2.26e + 07
E_GROW	616.6234	23.31031	26.45	0.000	0. 570.936	662.3107

Table 6. xtcointreg.

	Coefficient	*t*-Statistics
INV	−8.2e + 06	−12.42
EXCH_R	−2.8e + 05	−28.98
POP_GROW	7.9e + 07	14.94
GOV_EXP	−4.3e + 06	−4.34
INFL	9.6e + 06	27.85
E_GROW	1072.24	58.07

Table 7. Cointegration regression (FMOLS).

REM	Coefficient	Std. err	*z*	$p > z$	[95% conf	interval]
INV	−7,083,832	288,355.5	−24.57	0.000	−7,648,998	−6,518,666
EXCH_R	−208,089.3	3386.22	−61.45	0.000	−214,726.1	−201,452.4
POP_GROW	7.17e + 07	2,273,271	31.53	0.000	6.72e + 07	7.61e + 07
GOV_EXP	−2,907,300	428,790.4	−6.78	0.000	−3,747,714	−2,066,886
INFL	9,205,911	141,337.3	65.13	0.000	8,928,895	9,482,927
E_GROW	938.9029	6.963487	134.83	0.000	925.2547	952.551
_CONS	−6,743,647	46,939.88	−143.67	0.000	−6,835,647	−6,651,646

Table 6 represents INV: This indicates a statistically significant negative relationship between INV and the dependent variable. EXCH_R (exchange rate): This suggests a significant negative relationship between EXCH_R and the dependent variable. POP_GROW (population growth): This indicates a statistically significant positive relationship between POP_GROW and the dependent variable. GOV_EXP (government expenditure): This suggests a statistically significant negative relationship between GOV_EXP and the dependent variable. INFL: This indicates a significant positive relationship between INFL and the dependent variable. E_GROW (economic growth): This suggests a highly significant positive relationship between E_GROW and the dependent variable.

4.5. Cointegration regression fully modified OLS (FMOLS)

The results of the cointegration regression using FMOLS are presented in Table 7. The dependent variable is REM, and the independent variables include INV, EXCH_R, POP_GROW, GOV_EXP, INFL, E_GROW and the constant term _CONS. Table 7 shows the result:

In Table 7, the results indicate that all independent variables (INV, EXCH_R, POP_GROW, GOV_EXP, INFL and E_GROW) are statistically significant predictors of the dependent variable REM. The negative coefficients for INV, EXCH_R and GOV_EXP suggest an inverse relationship, while positive coefficients for POP_GROW, INFL and E_GROW indicate positive relationships. The constant term _CONS also shows a significant negative impact on REM. The findings in Table 7 show that POP Grow, INV, GOVEXP, INFL and EGrow are statistically significant predictors in the model. These findings align with the conclusions drawn by Musakwa and Odhiambo (2022), Isoto and Kraybill (2017), Getish et al. (2020), Al-Malki et al. (2022) and Mohamed Aslam and Alibuhtto (2023). Abduvaliev and Bustillo (2020) assert that REMs positively contribute to EGrow.

5. Conclusions

This article aimed to analyze the impact of REM inflows on both social development and EGrow in Tanzania. Utilizing panel data from 1990 to 2022 and employing the Fourier Stationarity Test, the study conducted estimations that revealed a statistically significant relationship between migrant REMs and EGrow in the country. The findings imply that Tanzania can draw empirical insights into the dynamics of REM levels and their utilization by recipient households. These households spend less on food and education and tend to invest more in non-productive assets, such as housing, land or jewelry. These non-productive INVs represent transitional incomes that serve as strategies to assist vulnerable households in attaining a basic level of consumption. Notably, in Tanzania, it is emphasized that the receipt of migrants' REMs should be encouraged and coupled with incentives to channel these funds toward productive INVs.

Moreover, Tanzania must enhance the quality of governance, facilitating improved management of migrant REMs. Additionally, there is a need to create favorable conditions that encourage the growth of migrant REMs and steer them toward avenues and circumstances conducive to more productive utilization, thereby boosting exports from Tanzania. To accomplish this, Tanzanian authorities must adopt policies that acknowledge the specific realities of the country. Consequently, these policies should involve formulating new strategies for trade and INV openness, accompanied by developing initiatives that contribute to increased political stability. The augmentation of Tanzania's EGrow should not solely rely on conventional sources, such as FDI and terms of trade; rather, it should strategically maximize the impact of REMs through efficient and dependable transfer methods. Future research endeavor may explore additional variables, including financial development and the role of REMs in developing countries.

Stata tool

This article used Stata to analyse data and the tool has a Copyright.

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Data availability statement

Data available on request from the author.

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