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WORKERS' REMITTANCES, FOREIGN EXCHANGE INFLOWS, AND ECONOMIC GROWTH IN FRAGILE AND CONFLICT-AFFECTED STATES: EMPIRICAL EVIDENCE FROM YEMEN

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Abstract
Foreign exchange inflows, particularly workers' remittances, serve as a critical economic lifeline for fragile and conflict-affected nations facing severe export collapse. This paper empirically investigates the dynamic relationship between workers' remittances, foreign aid injections, parallel exchange rates, and real economic output in Yemen. Utilizing quarterly data spanning from 2015:Q1 to 2023:Q4, an Autoregressive Distributed Lag (ARDL) co-integration framework and Vector Error Correction Model (VECM) are estimated. The empirical results reveal a statistically significant positive long-run impact of remittance flows on domestic economic activity and household consumption buffering. However, the transmission mechanism is severely hindered by financial sector fragmentation, non-bank informal transfer channels (Hawala), and exchange rate volatility. The study underscores the necessity of integrating informal financial conduits into formal banking channels and promoting financial inclusion to leverage remittances for capital accumulation.

Keywords: Workers' Remittances, FX Inflows, Economic Growth, ARDL Co-integration, Conflict Economics, Financial Inclusion, Yemen.

2. Introduction & Problem Statement

2.1 Background

Since the onset of the conflict in 2015, Yemen's primary sources of foreign exchange hydrocarbon exports and foreign direct investment (FDI) have plummeted by over 80%. In the absence of traditional export revenue, personal remittances sent by the Yemeni diaspora (predominantly residing in GCC countries) have emerged as the primary source of foreign currency, estimated between $3.5 billion and $4.5 billion annually. These private inflows significantly outweigh official development assistance (ODA) and humanitarian aid grants.

2.2 Problem Statement

While literature emphasizes those remittances stimulate consumption and alleviate poverty, their aggregate effect on long-term economic growth (GDP) in conflict settings remains disputed. In Yemen, the absence of an integrated formal banking system has funneled over 70% of remittance flows through informal money transfer operators (Hawala network). Consequently, these foreign exchange inflows contribute to immediate household consumption rather than productive investment or bank deposit creation. This study addresses the central problem: How do external foreign exchange inflows (remittances vs. foreign aid) affect real GDP growth under conditions of institutional and monetary fragmentation?

2.3 Research Hypotheses

H_1: Workers' remittances have a statistically significant positive long-run effect on real economic growth in Yemen.

H_2: The pass-through effect of foreign exchange inflows to economic growth is conditioned by exchange rate volatility and parallel market spreads.

3. Literature Review

Economic theory offers two competing perspectives regarding remittance inflows: The Optimistic (Capital Accumulation) View: Models developed by Mundaca (2009) argue that remittances alleviate credit constraints, boost domestic liquidity, and fund small-scale capital investments in developing economies.

The Pessimistic (Dutch Disease & Moral Hazard) View: Chami et al. (2005) assert that remittances can induce "Dutch Disease" effects by appreciating the real exchange rate, suppressing export competitiveness, and reducing domestic labor participation.

In conflict economies, remittances function primarily as compensatory transfers (Aggarwal et al., 2011). Existing studies on Yemen (e.g., Al-Sabbary, 2020) have largely been descriptive; this paper contributes by measuring the co-integrating long-run parameters using ARDL modeling.

3.1 The Hawala System and Financial Intermediary Disintermediation>>>>>>>>>>>>>

A defining characteristic of Yemen's foreign exchange inflow dynamics is the dominant reliance on informal Money Transfer Operators (MTOs) and Hawala networks. Due to the impairment of commercial bank correspondent relationships globally, over 70% of worker remittances enter Yemen through informal conduits. While Hawala networks provide rapid and decentralized liquidity across urban and rural areas, they bypass the formal banking sector, preventing remittance inflows from being converted into long-term commercial bank deposits. Consequently, these capital inflows fail to support domestic credit creation or private sector investment, functioning strictly as emergency household consumption subsidies rather than drivers of structural economic capital accumulation.

3-5 Short-Run Granger Causality and Impulse Response Analysis

To evaluate the directional relationship between variables, a pairwise Granger Causality test was conducted within a Vector Autoregressive (VAR) framework.
(Granger Causality Tests)

Decision	Prob.	F-Statistic	Null Hypothesis (H_0)
Reject H_0 (Unidirectional Causality)	*0.001	8.421	$\ln(REM)$ does not Granger Cause $\ln(RGDP)$
Fail to Reject H_0	0.338	1.104	$\ln(RGDP)$ does not Granger Cause $\ln(REM)$
Reject H_0 (Exchange Rate drives Remittance	*0.008	5.312	$\ln(EX)$ does not Granger Cause $\ln(REM)$

Note: The results confirm unidirectional causality running from remittance inflows to real GDP growth, confirming H_1.

4. Methodology & Econometric Model

4.1 Model Specification

We express real GDP growth as a function of personal remittances (REM), humanitarian aid/foreign aid (AID), parallel exchange rates (EX), and gross fixed capital formation (GFCF):

$$ln(RGDP) = \beta + \beta_1 ln(REM_1) + \beta 2\, ln(AID_1) + \beta 3\, ln(EX_1) + \beta_1 ln(GFCF_1) + \varepsilon\tau$$

Using the ARDL bounds testing framework:

$$\Delta \ln(RGDP_t) = \alpha_0 + \sum_{i=1}^{p} \gamma_{1i} \Delta \ln(RGDP_{t-i}) + \sum_{j=0}^{q_1} \gamma_{2j} \Delta \ln(REM_{t-j}) + \sum_{k=0}^{q_2} \gamma_{3k} \Delta \ln(AID_{t-k}) + \theta_1 \ln(RGDP_{t-1}) + \theta_2 \ln(REM_{t-1}) + \theta_3 \ln(AID_{t-1}) + \varepsilon_t$$

5. Empirical Results & Discussion

(ADF Unit Root Test)

Status	1st Diff Prob.	1st Diff t-stat	Level Prob.	Level t-stat	Variable
$I(1)$	***0.000	5.11-	0.412	1.72-	$\ln(RGDP)$
$I(1)$	***0.000	6.34-	0.228	2.15-	$\ln(REM)$
$I(0)$	***0.000	7.21-	0.031	3.12-	$\ln(AID)$
$I(1)$	***0.000	5.88-	0.548	1.45-	$\ln(EX)$

(Long-Run Coefficients - ARDL)

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0001	4.703	0.091	*0.428	$\ln(REM)$
0.0621	1.931	0.058	0.112	$\ln(AID)$
0.0004	3.944-	0.072	*0.284-	$\ln(EX)$
0.0000	5.221	0.410	*2.141	Constant

Diagnostics: R2 = 0.88, F-stat = 42.6 (p < 0.001), Error Correction Term $ECT_{t-1} = -0.364$.*

Discussion

Remittance Elasticity: A 10% increase in remittance inflows expands real aggregate economic activity by 4.28% in the long run. Remittances act as an automatic economic stabilizer during conflict.

Speed of Adjustment: The ECT_{t-1} coefficient (-0.364) indicates that 36.4% of short-run deviations from the long-run equilibrium are corrected each period.

Negative Exchange Rate Effect: Exchange rate depreciation significantly erodes the purchasing power value of incoming remittances.

6. Policy Recommendations

Formalization of Transfer Channels: Establish incentives for money transfer operators (MTOs) to link with commercial banks to convert remittances into formal bank deposits.

Financial Inclusion Programs: Develop specialized micro-finance and Islamic financial products targeted at remittance-receiving households to foster small business creation.

Stabilization of FX Clearing Rates: Standardize foreign exchange clearing rates across financial intermediaries to eliminate parallel market arbitrage.

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