The Foreign Aid and Remittance Nexus: Evidence from South Asia

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Road Map

- Introduction
- Literature Review
- Why South Asia? (Aid and Remittance flows in the region)
- Modelling Framework
- Estimation Results
- Findings

Introduction

In developing countries, foreign aid and remittances

- are the two major sources of external finance
- provide significant support in stabilizing fiscal balances
- play an important role in income and consumption
- improve economic growth
- help reduce poverty and inequality.

Relevant Literature

- There is limited literature on the relationship between foreign aid and remittances received

- Separate analysis of these two financial flows (foreign aid and remittances) could be misleading (Kpador & Le Goff, 2012).

- Positive (complementary) relationship between foreign aid and remittances (Arvin & Lew, 2012; Driffield & Jones, 2013)

- There is a degree of substitution between foreign aid and remittances (Amuedo- Dorantes *et al*., 2007; Bettin *et al*., 2015; Abbas et al., 2021)

Relevant Literature

- Demand for aid is reduced if remittances are well invested into physical and human capital (HC), positive relationship through lobby channel (Kpador and Le Goff, 2012)

- Aid contributes to increasing aggregate welfare measured by infant mortality and HDI in recipient countries (Gomanee *et al.*, 2005)

- Aid → Welfare Expenditures → HC

Why South Asia?

- The South Asian region comprises of 8 developing countries.
- In 2015, this region

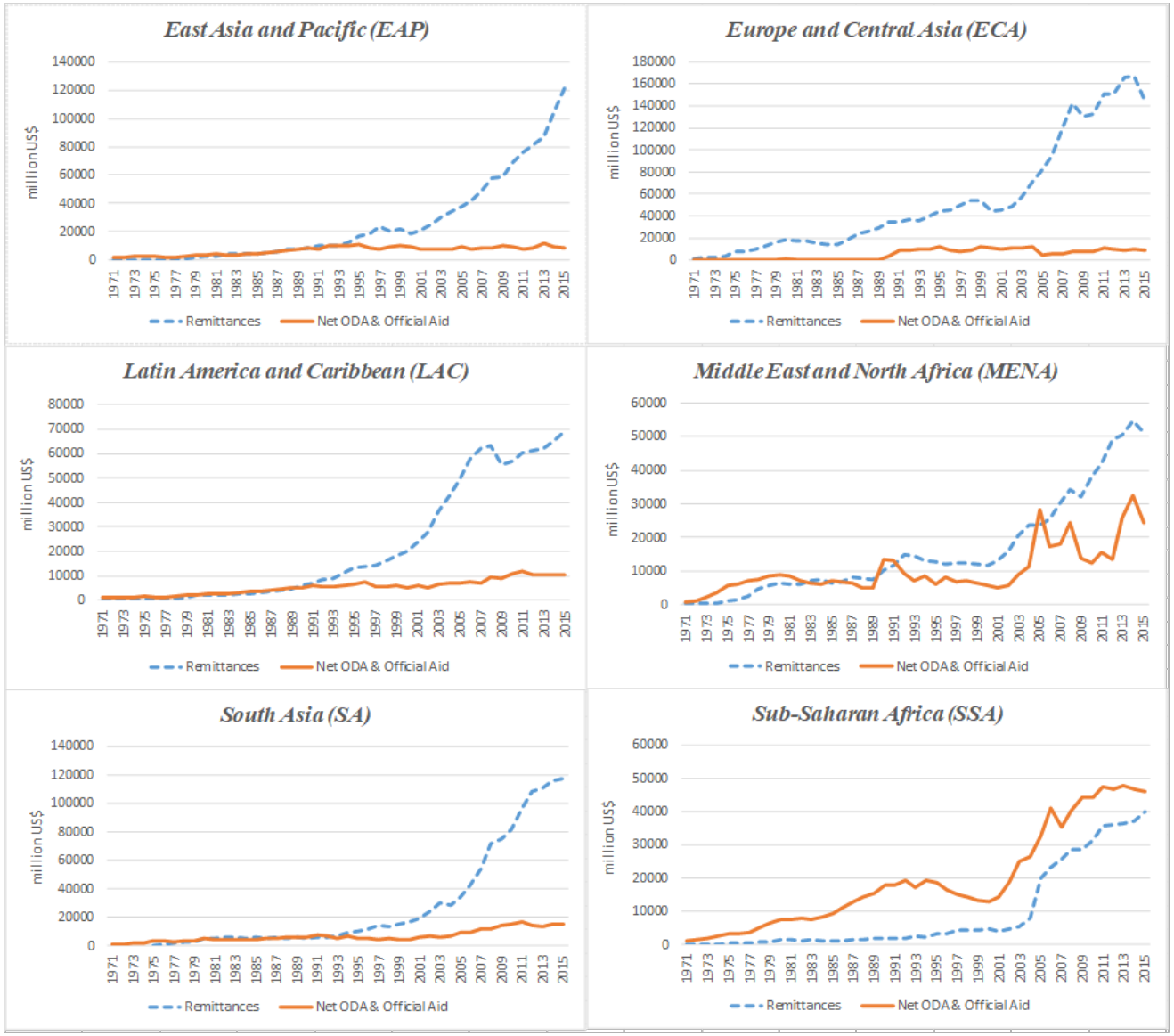
  - is home for 24 percent of the World's population
  - supplied 20 percent of the World's labour force
  - contributed 14 percent share of the World's agriculture production
  - received 10 percent of total foreign aid disbursed to developing countries
  - received 21 percent of remittances received worldwide

Remittances and Foreign Aid:
Top 15 Remittance Receiving Countries, 2011-15 (Average)

	Country	Remittance received (US$bn)	Share of Remittance in World total (%)	Remittance per capita (US$)	Remittance as a proportion of GDP (%)	Aid (US$bn)	Aid per capita (US$)	Aid as a proportion of GDP (%)
	(1)	(2)	(3)	(5)	(4)	(6)	(7)	(8)
1	India	68.1	13.2	53.3	3.5	2.7	2.1	0.1
2	Philippines	26.6	5.2	269.4	10.0	0.2	2.4	0.1
3	China	25.2	4.8	18.5	0.2	-0.5	-0.4	--
4	Mexico	24.2	4.7	197.3	2.0	0.6	5.0	0.1
5	Nigeria	20.8	4.0	120.9	4.3	2.2	12.9	0.5
6	Egypt	17.9	3.5	198.6	6.2	2.7	30.4	0.9
7	Pakistan	15.5	2.9	84.9	6.5	3.0	16.6	1.3
8	Bangladesh	14.1	2.7	89.2	9.2	2.2	14.3	1.5
9	Vietnam	10.9	2.1	121.8	6.5	3.8	42.8	2.3
10	Indonesia	7.9	1.5	31.7	0.9	0.0	0.1	0.0
11	Ukraine	7.8	1.5	172.2	5.4	1.0	22.9	0.8
12	Morocco	7.1	1.4	208.9	6.9	1.7	50.4	1.6
13	South Korea	6.5	1.3	129.2	0.5	--	--	--
14	Sri Lanka	6.3	1.2	306.5	8.6	0.5	23.6	0.7
15	Thailand	5.9	1.1	87.8	1.5	0.0	0.5	0.0

Source: World Development Indicators, World Bank, various years.

Aid and Remittances: Regional Flows



Source: World Development Indicators, World Bank, various years.

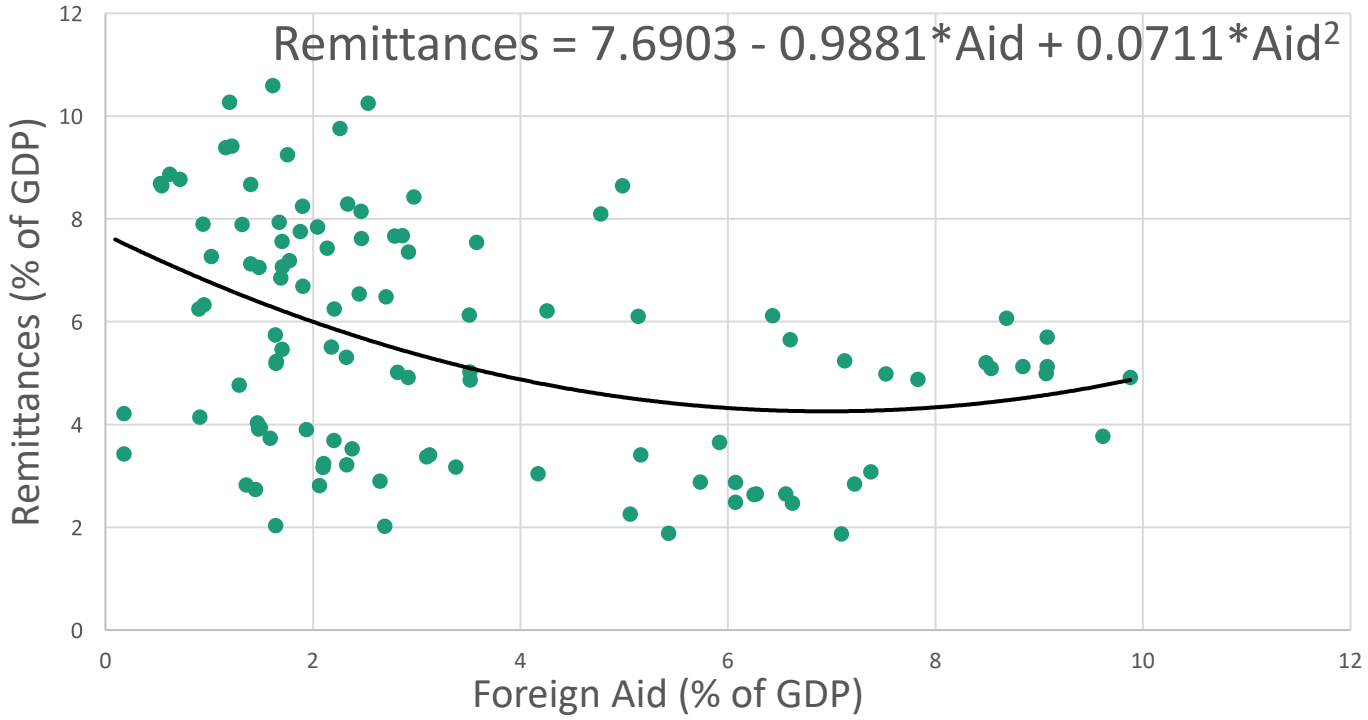
Share of various Indicators, Individual Countries in South Asia and in the World, Sample Average: 2011-15

	Individual country share in World total					Share of South Asia in World	Individual country share within South Asia				
Indicator	BGD	IND	PAK	SLK	Others in SA		BGD	IND	PAK	SLK	Others in SA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Population	2.2	17.8	2.5	0.3	0.8	23.6	9.3	75.2	10.7	1.2	3.6
Labour Size	1.9	14.4	1.9	0.3	0.8	19.3	9.8	74.9	9.7	1.3	4.3
Remittances	2.7	13	3	1.2	1.1	21	12.8	62.1	14.1	5.8	5.2
Foreign Aid	1.5	1.8	2	0.3	4.6	10.3	14.8	17.8	19.8	3.2	44.4
Economy size (GDP)	0.2	2.5	0.3	0.1	0.1	3.2	6.4	79.1	9.7	3.0	1.8
Agriculture Production	0.8	10.3	1.8	0.2	0.4	13.4	5.8	76.7	13.5	1.4	2.7

BGD= Bangladesh, IND= India, PAK= Pakistan, SLK= Sri Lanka.

Source: WDI, World Bank, various years.

Remittances vs Foreign Aid: South Asia (Pooled over countries and time)



The Model

- $Rem_{it} = \alpha_i + \beta_1 Aid_{it} + \delta' \boldsymbol{X}_{it} + \lambda_i + \varepsilon_{it}$ *(1)* $t = 1, 2, .., T$ and $i = 1, 2, \ldots, N$

- **Rem =** Remittance flows as percentage of GDP
- **Aid =** Foreign aid as a percentage of GDP
- Set of control/explanatory variables, ***X***
  1. **Migrant =** Migrant stock to population ratio
  2. **Trade =**Trade Openness proxied by Trade as a percentage of GDP
  3. **Exchange =** Exchange rate measured by local currency units per US dollar
  4. **GDP =** GDP growth rate
  5. **Polity =** Political stability
  6. **FDI =** Foreign direct investment as percentage of GDP
  7. **Education =** Public spending on education as percentage of GDP
  8. **Inflation**

Model 2 (non-linear aid with transmission channels)

- $$Rem_{it} = \alpha_i + \beta_1 Aid_{it} + \beta_2 Aid_{it}^2 + \gamma_1 Aid_{it} * HC_{it} + \gamma_2 Aid_{it} * HC_{it} * Migration_{it} + \gamma_3 Aid_{it} * HC_{it} * Growth_{it} + \delta' \boldsymbol{X}_{it} + \lambda_i + \varepsilon_{it} \quad (2)$$

Research Strategy

- We use data of four South Asian countries namely Bangladesh, India, Pakistan, and Sri Lanka (due to data availability) for the period 1980-2015

- Applying the fixed effect (FE) and IV-2SLS FE estimation techniques to control heterogeneity and endogeneity.

- Data Sources:
  - World Development Indicators
  - UN Migration Database
  - UNESCO Institute of Statistics
  - Polity IV Database

Causality Tests

Null Hypothesis	VAR Granger Causality/ Block Exogeneity Wald Test	Pairwise Granger Causality/ Dumitrescu-Hurlin Panel Test	Conclusion
	(p-value)	(p-value)	
Remittances does not Granger cause Aid	0.119	0.117	Remittances ≠> Aid
Aid does not Granger cause Remittances	0.059	0.041	Aid => Remittances
Remittances does not Granger cause Growth	0.229	0.237	Remittances ≠> Growth
Growth does not Granger cause Remittances	0.042	0.047	Growth => Remittances
Remittances does not Granger cause Human capital (HC)	0.307	0.308	Remittances ≠> HC
Human capital (HC) does not Granger cause Remittances	0.100	0.104	HC => Remittances*
Remittances does not Granger cause Migration	0.181	0.185	Remittances ≠> Migration
Migration does not Granger cause Remittances	0.100	0.104	Migration => Remittances*

*Causality running from human capital to remittances and from migration to remittances are significant at the 11 percent level.

Pesaran Cross-sectional Dependence (CD) Test

Null Hypothesis: No cross-sectional dependence (CD)

Variables	Test-Statistic	Prob.
Aid (% of GDP)	12.334	0.000
Exchange Rate (LCU=US$)	14.161	0.000
FDI (% of GDP)	7.471	0.000
GDP Growth (% annual)	1.532	0.126
Human Capital (% of GDP)	2.933	0.003
Inflation (CPI, % annual)	3.968	0.000
Migration (% of Pop.)	0.438	0.661
Polity	0.388	0.698
Remittances (% of GDP)	5.410	0.000
Trade (% of GDP)	-1.367	0.172

Cross-sectionally adjusted Unit Root Test results

Variables	Fisher-ADF	Fisher-PP	CIPS	Conclusion
Aid (% of GDP)				
Level (intercept and trend)	14.952 (0.060)	31.832 (0.000)	-1.281 (0.100)	*I(0)*
Exchange Rate (LCU=US$)				
Level (intercept and trend)	8.304 (0.404)	5.603 (0.692)	-0.351 (0.362)	*I(1)*
First Difference	42.765 (0.000)	65.149 (0.000)	-5.572 (0.000)	
FDI (% of GDP)				
Level (intercept and trend)	19.496 (0.012)	15.809 (0.045)	-2.376 (0.008)	*I(0)*
GDP Growth (% annual)				
Level (intercept and trend)	33.983 (0.000)	82.940 (0.000)	-4.491 (0.000)	*I(0)*
Human Capital (% of GDP)				
Level (intercept)	16.079 (0.041)	22.357 (0.004)	-1.956 (0.025)	*I(0)*
Inflation (CPI, % annual)				
Level (intercept)	28.820 (0.000)	41.362 (0.000)	-3.575 (0.000)	*I(0)*
Migration (% of Pop.)				
Level (intercept)	6.863 (0.551)	17.301 (0.027)	0.243 (0.596)	*I(1)*
First Difference	17.643 (0.024)	19.180 (0.014)	-5.147 (0.011)	
Polity				
Level (intercept)	14.005 (0.081)	10.221 (0.249)	-1.388 (0.082)	*I(1)*
First Difference	33.914 (0.000)	46.835 (0.000)	-4.721 (0.000)	
Remittances (% of GDP)				
Level (intercept and trend)	7.459 (0.488)	9.158 (0.329)	0.358 (0.640)	*I(1)*
First Difference	51.430 (0.000)	85.249 (0.000)	-6.603 (0.000)	
Trade (% of GDP)				
Level (intercept and trend)	5.273 (0.728)	10.164 (0.254)	0.508 (0.694)	*I(1)*
First Difference	32.122 (0.000)	75.433 (0.000)	-3.931 (0.000)	

p-values are given in parentheses

PMG/ ARDL Model

- Model 3 (ARDL Model)

$$Rem_{it} = \sum_{j=1}^{p} \lambda_{ij} Rem_{i,t-j} + \sum_{j=0}^{q} \beta_{ij} Aid_{i,t-j} + \sum_{j=0}^{q} \boldsymbol{\delta'}_{ij} \boldsymbol{X}_{i,t-j} + \mu_i + \varepsilon_{it} \qquad (3)$$

- Model 4 (Long-term Relationship)

$$Rem_{it} = \beta_i Aid_{i,t} + \theta'_i \boldsymbol{X}_{i,t} + \upsilon_{it} \qquad (4)$$

- Model 5 (Error-Correction Model)

$$\Delta Rem_{it} = \phi_i \, EC_{it-1} + \sum_{j=1}^{p} \lambda^*_{ij} \Delta Rem_{i,t-j} + \sum_{j=0}^{q} \beta^*_{ij} \Delta Aid_{i,t-j} + \sum_{j=0}^{q} \delta'^*_{ij} \, \Delta X_{i,t-j} + \mu_i + \varepsilon_{it} \qquad (5)$$

(5)

where $\phi_i = -(1 - \sum_{j=1}^{p} \lambda_{ij})$; the error correction term $EC_{it-1} = Rem_{i,t-1} - \beta_i Aid_{i,t-1} - \theta'_i \boldsymbol{X}_{i,t-1}$;

Mean values of variables of interest, Selected South Asian countries, 1980-2015

Variables	Bangladesh	India	Pakistan	Sri Lanka	Overall (Four SA countries)
	(1)	(2)	(3)	(4)	(5)
Aid (% of GDP)	3.65	0.46	2.10	4.60	2.62
Exchange Rate (LCU=US$)	48.7	33.80	46.51	70.18	
FDI (% of GDP)	0.44	0.84	0.93	1.10	0.84
GDP Growth (%)	4.87	6.33	4.86	5.08	5.28
Human capital (% of GDP)	1.75	3.57	2.40	2.34	2.53
Inflation (CPI, %)	6.72	8.02	8.30	10.12	8.29
Migration (% of Population)	4.76	0.87	3.11	5.42	3.54
Polity	1.36	8.58	1.31	4.94	4.14
Remittances (% of GDP)	4.94	2.25	5.00	6.59	4.72
Trade (% of GDP)	28.76	28.96	33.98	68.65	40.07

Panel Fixed Effect Estimation Results, Models 1 and 2, South Asia, 1980-2015

Dependent Variable: Remittances (% of GDP)

	Model 1		Model 2		Restricted Models			
	FE	IV-2SLS	FE	IV-2SLS	IV-2SLS			
Independent variables	coefficient (1)	coefficient (2)	coefficient (3)	coefficient (4)	Excl. channels coefficient (5)	HC coefficient (6)	HC-Migration coefficient (7)	HC-Growth coefficient (8)
constant	-2.067	-0.102	-2.195	-0.097	9.042***	5.492**	6.335*	8.237***
	(1.598)	(1.843)	(1.516)	(2.781)	(3.127)	(2.298)	(3.384)	(2.980)
Aid	-0.193*	-0.466***	-1.186***	-3.465***	-4.575***	-3.894***	-4.318***	-5.076***
	(0.105)	(0.159)	(0.228)	(0.780)	(1.042)	(0.751)	(0.867)	(0.962)
Aid (Sq.)			0.039**	0.208**	0.331***	0.256***	0.348***	0.400***
			(0.019)	(0.087)	(0.102)	(0.081)	(0.082)	(0.086)
Exchange Rate	0.022***	0.009	0.022***	0.006	-0.061***	-0.012	-0.027*	-0.029**
	(0.008)	(0.010)	(0.007)	(0.013)	(0.019)	(0.013)	(0.014)	(0.014)
FDI	-0.515**	-0.541**	-0.197	-0.598**	-0.890**	-0.643**	-0.771**	-0.718**
	(0.248)	(0.254)	(0.168)	(0.267)	(0.381)	(0.302)	(0.334)	(0.347)
Growth	0.163**	0.139*	-0.023	-0.118	0.001	0.043	0.052	-0.293*
	(0.072)	(0.075)	(0.044)	(0.111)	(0.112)	(0.086)	(0.096)	(0.150)
HC	0.295	0.256	-0.454	-1.198	0.246	-1.300	-0.407	-0.844
	(0.393)	(0.404)	(0.289)	(0.782)	(0.592)	(0.789)	(0.812)	(0.653)
Inflation	0.007	0.026	-0.015	0.008	0.068	0.011	0.008	-0.014
	(0.037)	(0.038)	(0.021)	(0.038)	(0.058)	(0.042)	(0.048)	(0.051)
Migration	0.471**	0.379*	1.099***	1.831***	0.757*	1.022***	0.889**	1.234***
	(0.216)	(0.224)	(0.245)	(0.316)	(0.392)	(0.287)	(0.366)	(0.340)
Polity	-0.069*	-0.085**	-0.091**	-0.124***	-0.117**	-0.082*	-0.065	-0.078
	(0.036)	(0.038)	(0.036)	(0.040)	(0.057)	(0.043)	(0.048)	(0.050)
Trade	0.088***	0.085***	0.106***	0.132***	0.096***	(0.108***	0.103***	0.115***
	(0.016)	(0.017)	(0.010)	(0.018)	(0.025)	(0.019)	(0.022)	(0.023)
Aid*HC			0.804***	1.101***		0.448***		
			(0.135)	(0.303)		(0.167)		
Aid*HC*Migration			-0.112***	-0.142***			0.036	
			(0.021)	(0.038)			(0.028)	
Aid*HC*Growth			0.011*	0.030*				0.066***
			(0.006)	(0.015)				(0.020)
R-Squared	0.694	0.639	0.895	0.889	0.488	0.658	0.222	0.393
F-Stat	23.22	5.66	65.47	13.54	7.76	6.67	7.18	7.23
Prob. (F-Stat)	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	140	140	140	140	140	140	140	140

Estimation Results: PMG

Dependent Variable: Remittances (% of GDP)
ARDL Estimation Method (2,2,2,2,2,2,2,2,2,2)

Independent Variables	Long run Coefficient (1)		Short run Coefficient (2)	
Aid	-0.281 (0.109)	**	0.162 (0.094)	*
Exchange Rate	0.075(0.007)	***	0.026 (0.038)	
FDI	0.784 (0.215)	***	-0.147 (0.176)	
Growth	0.522 (0.081)	***	-0.184 (0.080)	**
HC	-2.492 (0.261)	***	0.797 (0.831)	
Inflation	0.074 (0.026)	***	-0.061 (0.040)	
Migration	0.861 (0.179)	***	-6.269 (5.548)	
Polity	0.004 (0.015)		0.129 (0.086)	
Trade	0.005 (0.019)		0.038 (0.013)	***
Error Correction term (ϕ)			-0.409 (0.244)	*
Remittances (lag)			0.104 (0.168)	

Standard Errors are given in parentheses.

***, **, * represent the significance at 1%, 5%, and 10% respectively.

Findings

- Overall, foreign aid negatively affects remittances in South Asia, indicating the degree of *substitutability* between the two external financial flows.

- We find a quadratic (U-shaped) relationship between foreign aid and remittances.

- Foreign aid's support of human capital increases remittances overall.

- Furthermore, we find that the *foreign aid-led human-capital* channel of migration (particularly of skilled people) reduces remittances,

- while the *aid-led human-capital channel of economic growth* increases remittance flows in South Asia

Findings

- The dynamic modelling estimation suggests that foreign aid positively affects (or complements) remittance flows in the short run

- In the long run, aid negatively affects remittances, indicating the substitutability of the two flows.

Thank You

Comments and Suggestions