
REMITTANCES, EXCHANGE RATE REGIMES, AND THE DUTCH DISEASE: A PANEL STUDY

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CONTEXT

- International migrant remittances reached 265 billion dollars in 2007 in developing countries, around 2% of overall GDP and 2/3 FDI flows.
- For some countries, they represent a sizable source of income: Tajikistan (46% of GDP), Moldova (38%), Lesotho (29%), Honduras (25%), Lebanon (24%), Guyana (24%), etc.
- Literature shows positive impacts of remittances in poverty reduction, human and physical capital accumulation, and entrepreneurship.

QUESTIONS

- Can the inflow of remittances cause Dutch disease effects in recipient economies?
 - Massive income flows, higher household income, real exchange rate appreciation, competitiveness loss, and reduction in tradable output share.
 - Rodrik (2007) shows that REER overvaluation undermines long-term growth in developing countries.
- Can we observe these spending and resource movement effects?
- Can exchange rate policy attenuate these effects?

MOTIVATION

- Acosta, Lartey, Mandelman (2007): DSGE small open economy model with remittances in three scenarios:
 - Altruistic:
 - Exogenous: independent of domestic economy
 - Countercyclical: endogenously determined
 - Self-interested: remittances as private capital inflows
- Data for El Salvador match model predictions of real exchange rate appreciation and resource allocation towards non-tradables in all scenarios

CONTRIBUTION

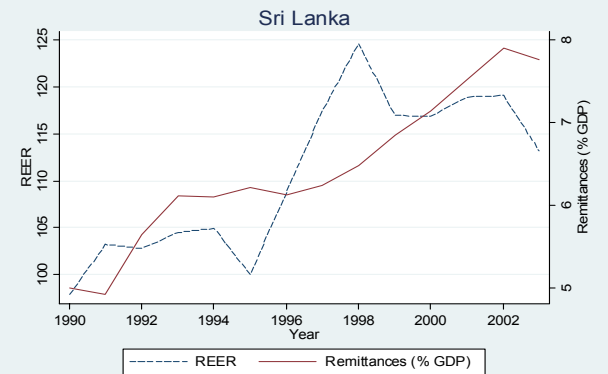
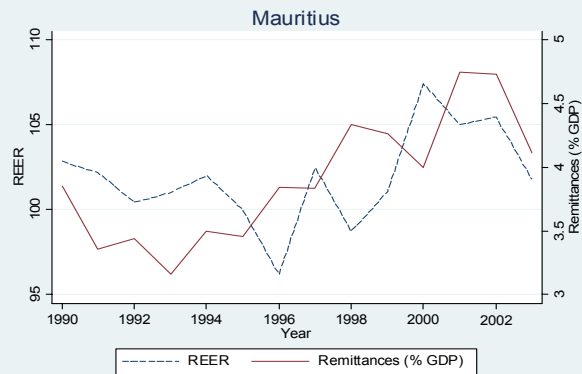
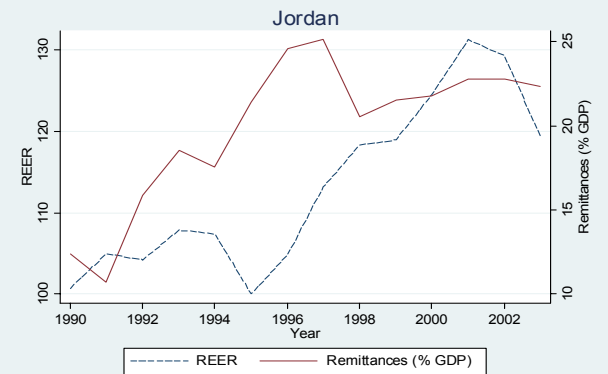
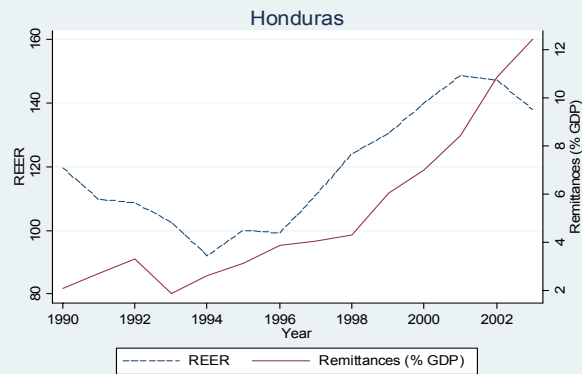
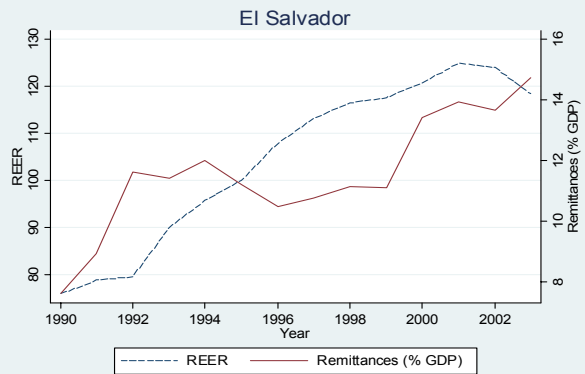
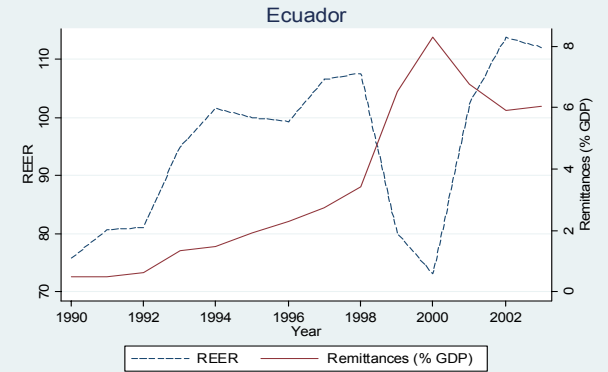
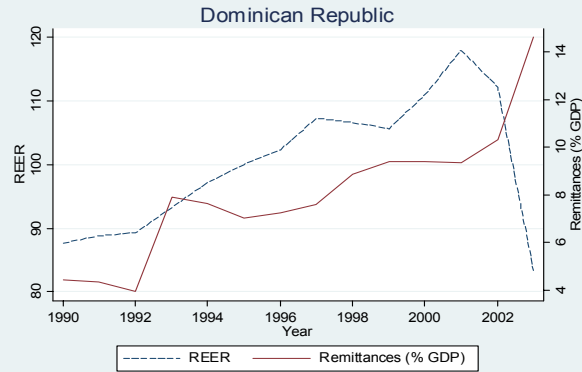
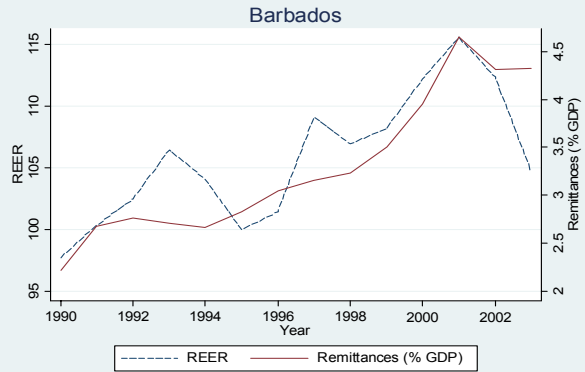
- Generalize the results using panel data for 109 developing countries (1990-2003)
- Traditional approach: Real exchange rate as dependent variable (Amuedo-Dorantes and Pozo, 2004; Lopez et al, 2007).
- New approach: Tradable-Non tradable output ratio, captures resource movement effects.
- Also, sectorial output dependent variables: agriculture, manufacturing and services
- Are these effects different for fixed vs. flexible exchange rate regimes?

Descriptive Preliminary Evidence

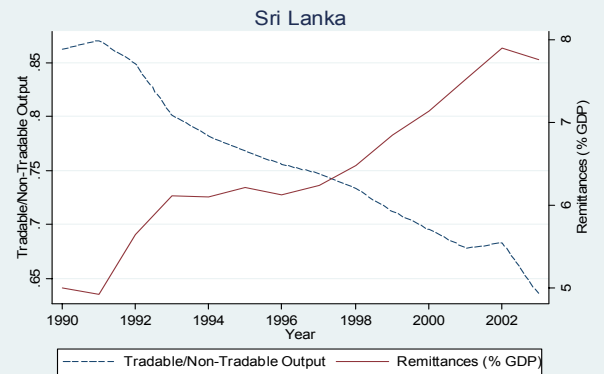
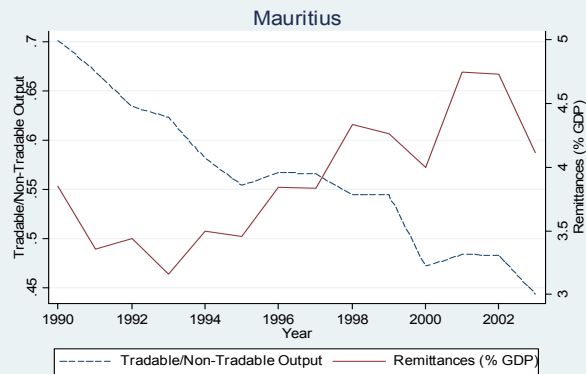
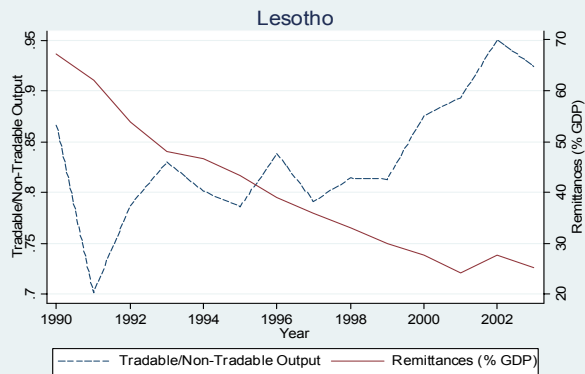
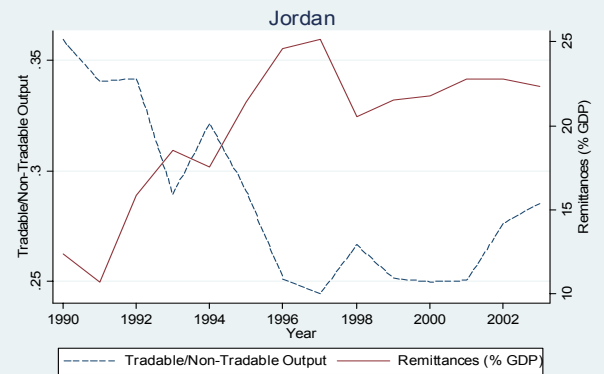
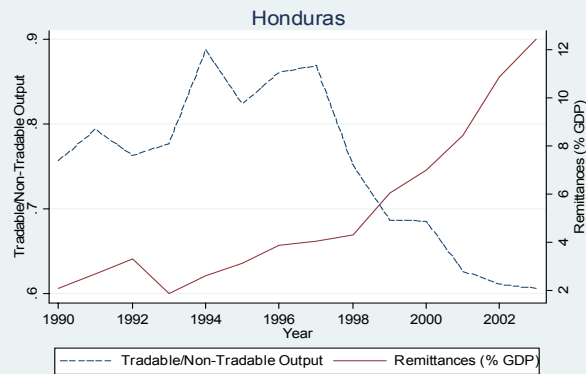
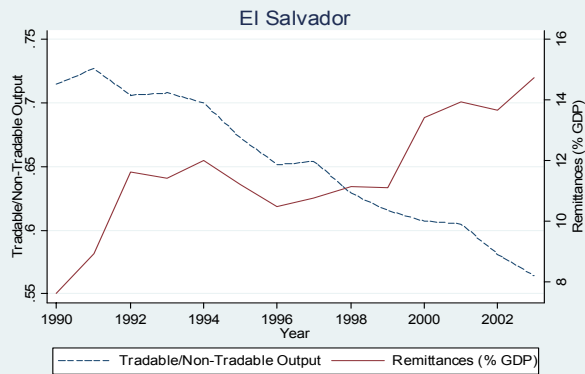
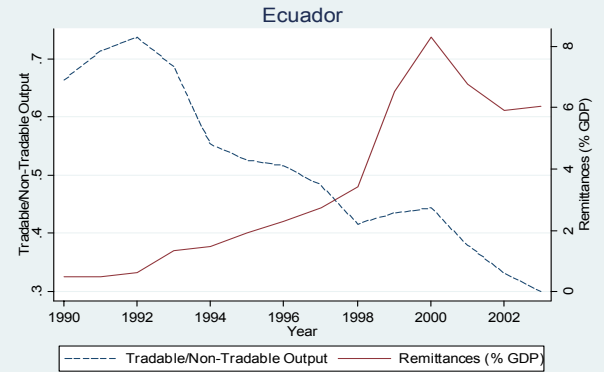
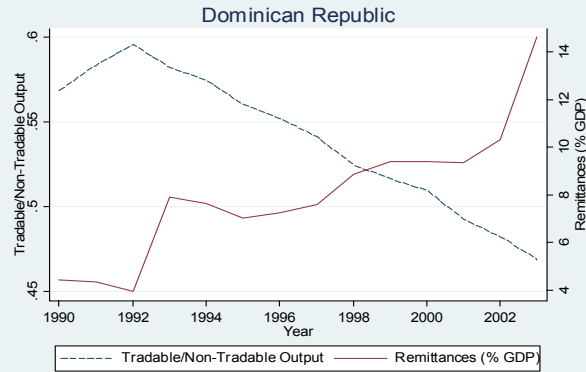
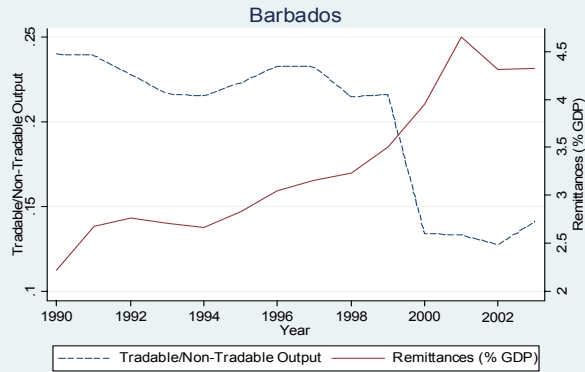
SAMPLE, 109 DEVELOPING COUNTRIES

Region	Countries	Total Remittances (million USD)		Remittances per capita (USD)		Remittances/GDP		REER appreciation (%)	Tradable/Non-Tradable Output	
		1995	2003	1995	2003	1995	2003	1995-2003	1995	2003
East Asia and the Pacific	13	9,690	32,500	6.01	18.61	0.78	1.66	40.79	1.15	1.01
Eastern Europe and Central Asia	21	7,970	12,100	19.16	29.24	0.85	0.96	14.16	0.90	0.63
Latin America and the Caribbean	28	13,400	34,900	30.18	69.56	0.85	2.13	2.85	0.52	0.41
Middle East and North Africa	9	11,600	18,100	60.35	81.43	4.75	5.20	17.92	0.55	0.49
South Asia	5	10,000	30,400	8.25	21.77	2.12	4.08	1.57	0.98	0.79
Sub-Saharan Africa	33	3,150	5,730	6.58	9.91	1.07	1.55	1.85	0.94	0.85
Total	109	57,805	133,730	12.82	27.53	1.17	2.12	10.43	0.82	0.68

REMITTANCES AND REAL EXCHANGE RATE



REMITTANCES AND T-NT OUTPUT RATIO



Methodology

MODEL ESTIMATION

- Fixed effects estimation (endogenous)
- System GMM estimation (Arellano and Bover, 1995)

$$y_{it} = \sum_{j=0}^p \alpha_j r_{i,t-j} + \beta x_{it} + (\eta_i + \lambda_t + \varepsilon_{it})$$

where y_{it} is REER, TNT ratio or sectorial output

r_{it} is the remittances measure (as % of GDP, or per capita)

x_{it} is the control set, including: GDP per capita, GDP growth, terms of trade, excess money growth, and trade openness.

η_i is a country fixed effect, and λ_t is a year dummy

- System of equations in levels and in differences, using lagged diff and levels of R and X as internal instruments
- System GMM-IV using as instruments primary enrollment rates and weighted GDP pc of five main migrant host countries

Results

REMITTANCES AND REER – GMM System

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Remittances (% GDP)	0.346*** (0.054)		0.424*** (0.055)	0.243*** (0.078)	0.403*** (0.050)	0.168** (0.066)
Remittances (% GDP) * Fixed Exchange Rate						0.290*** (0.044)
Remittances (USD per capita)		0.033*** (0.002)				
FDI (% GDP)			-0.038 (0.059)			
Non FDI Private Inflows (% GDP)				0.649*** (0.117)		
Government Expenditure growth (%)					0.051*** (0.010)	
GDP per capita ('000s USD)	0.778*** (0.300)	0.901*** (0.181)	1.371*** (0.227)	-0.217 (0.209)	1.010*** (0.279)	0.722** (0.283)
M2 (% GDP)	-0.149*** (0.019)	-0.170*** (0.015)	-0.099*** (0.015)	0.002 (0.016)	-0.121*** (0.014)	-0.151*** (0.020)
Terms of Trade (Goods and Services)	0.342*** (0.008)	0.375*** (0.011)	0.345*** (0.011)	0.477*** (0.015)	0.423*** (0.009)	0.341*** (0.010)
Trade Openness (X+M/GDP)	0.215*** (0.010)	0.169*** (0.016)	0.139*** (0.011)	0.071*** (0.015)	0.200*** (0.013)	0.225*** (0.011)
GDP growth (%)	-0.243*** (0.040)	-0.176*** (0.033)	-0.147*** (0.049)	-0.132*** (0.026)	-0.274*** (0.048)	-0.257*** (0.039)
Year Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Countries	100	100	99	94	100	100
Observations	884	884	858	793	819	884
Sargan Test	0.723	0.765	0.848	0.941	0.678	0.717
AR(1)	0.019	0.016	0.000	0.005	0.000	0.019
AR(2)	0.130	0.150	0.021	0.136	0.516	0.135

REMITTANCES AND TNT – GMM System

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Remittances (% GDP)	-0.010*** (0.001)			-0.008*** (0.001)	-0.009*** (0.001)	-0.008*** (0.001)	-0.012*** (0.001)	-0.002 (0.002)
Remittances (% GDP) t-1		-0.014*** (0.001)						
Remittances (% GDP) t-2			-0.015*** (0.001)					
FDI (% GDP)				-0.009*** (0.001)				
Non FDI Private Inflows (% GDP)					0.000 (0.001)			
Government Expenditure growth (%)						0.000 (0.000)		
Investment (% GDP)							0.004*** (0.001)	
Remittances (% GDP) * Fixed Exchange Rate								-0.010*** (0.001)
Countries	99	99	99	98	93	99	99	99
Observations	845	768	690	822	762	784	845	845
Sargan Test	0.808	0.850	0.848	0.851	0.975	0.846	0.812	0.790
AR(1)	0.088	0.036	0.014	0.117	0.060	0.027	0.093	0.081
AR(2)	0.100	0.432	0.090	0.121	0.100	0.336	0.112	0.095

REM. and SECTORIAL OUTPUT – GMM System

Dependent Variable	Agriculture (% GDP)	Manufacturing (% GDP)	Services (% GDP)
Remittances (% GDP)	-0.016 (0.025)	-0.118*** (0.017)	0.367*** (0.038)
GDP per capita ('000s USD)	-3.754*** (0.162)	0.237 (0.158)	4.061*** (0.131)
M2 (% GDP)	-0.023*** (0.007)	0.035*** (0.008)	0.016** (0.008)
Terms of Trade (Goods and Services)	0.029*** (0.003)	0.024*** (0.004)	0.057*** (0.005)
Trade Openness (X+M/GDP)	0.035*** (0.004)	0.033*** (0.004)	-0.044*** (0.006)
GDP growth (%)	-0.045*** (0.007)	0.044*** (0.006)	-0.010 (0.010)
Year Indicators	Yes	Yes	Yes
Countries	100	99	100
Observations	871	845	871
Sargan Test	0.733	0.913	0.703
AR(1)	0.037	0.001	0.017
AR(2)	0.146	0.029	0.441

GMM-IV System Estimation

Dependent Variable	Real Effective Exchange Rate			Tradable / Non-Tradable Output	Agriculture (% GDP)	Manufacturing (% GDP)	Services (% GDP)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Remittances (% GDP)	0.294*** (0.069)		0.141** (0.064)	-0.007*** (0.001)	0.031 (0.036)	-0.135*** (0.036)	0.450*** (0.048)
Remittances (% GDP) * Fixed Exchange Rate			0.182* (0.098)				
Remittances (USD per capita)		0.028*** (0.003)					
Countries	100	100	100	99	100	99	100
Observations	884	884	884	845	871	845	871
Sargan Test	0.978	0.985	0.982	0.994	0.989	0.997	0.980
AR(1)	0.004	0.004	0.003	0.031	0.012	0.000	0.000
AR(2)	0.120	0.152	0.117	0.128	0.166	0.022	0.518

Notes: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level. Two-step estimation.

Instruments include the first lagged difference and the second lagged level of remittances, GDP per capita, M2, terms of trade, trade openness, and GDP growth, as well as the first lagged level of two external instruments: primary school enrollment rates, weighted GDP per capita of the five main migrant host countries for each country.

Conclusion and Directions for Further Research

CONCLUSION

- We generalized Acosta et al (2007) findings of remittance spending effects through REER appreciation
- Also, evidence of resource movement effects towards non-tradable sectors:
 - Decline in manufacturing sectors as % of GDP
 - Increase in service sectors as % of GDP
- Dutch disease effects stronger in fixed exchange rate regimes

REMAINING QUESTIONS

- Are these effects important in terms of welfare? How do they counterbalance all other positive impacts of remittances?
- What is the role for fiscal and monetary policy to attenuate Dutch disease effects in high-remittance economies?