**POLICY OPTIONS AND CHALLENGES
FOR DEVELOPING ASIA—
PERSPECTIVES FROM THE IMF AND ASIA
APRIL 19-20, 2007
TOKYO**

MACROECONOMIC DETERMINANTS OF WORKERS' REMITTANCES

MARTA RUIZ-ARRANZ
INTERNATIONAL MONETARY FUND

Paper presented at the Conference: POLICY OPTIONS AND CHALLENGES FOR DEVELOPING ASIA—PERSPECTIVES FROM THE IMF AND ASIA
Organized by the International Monetary Fund (IMF) and
Japan Bank for International Cooperation (JBIC)
April 19-20, 2007
Tokyo, Japan

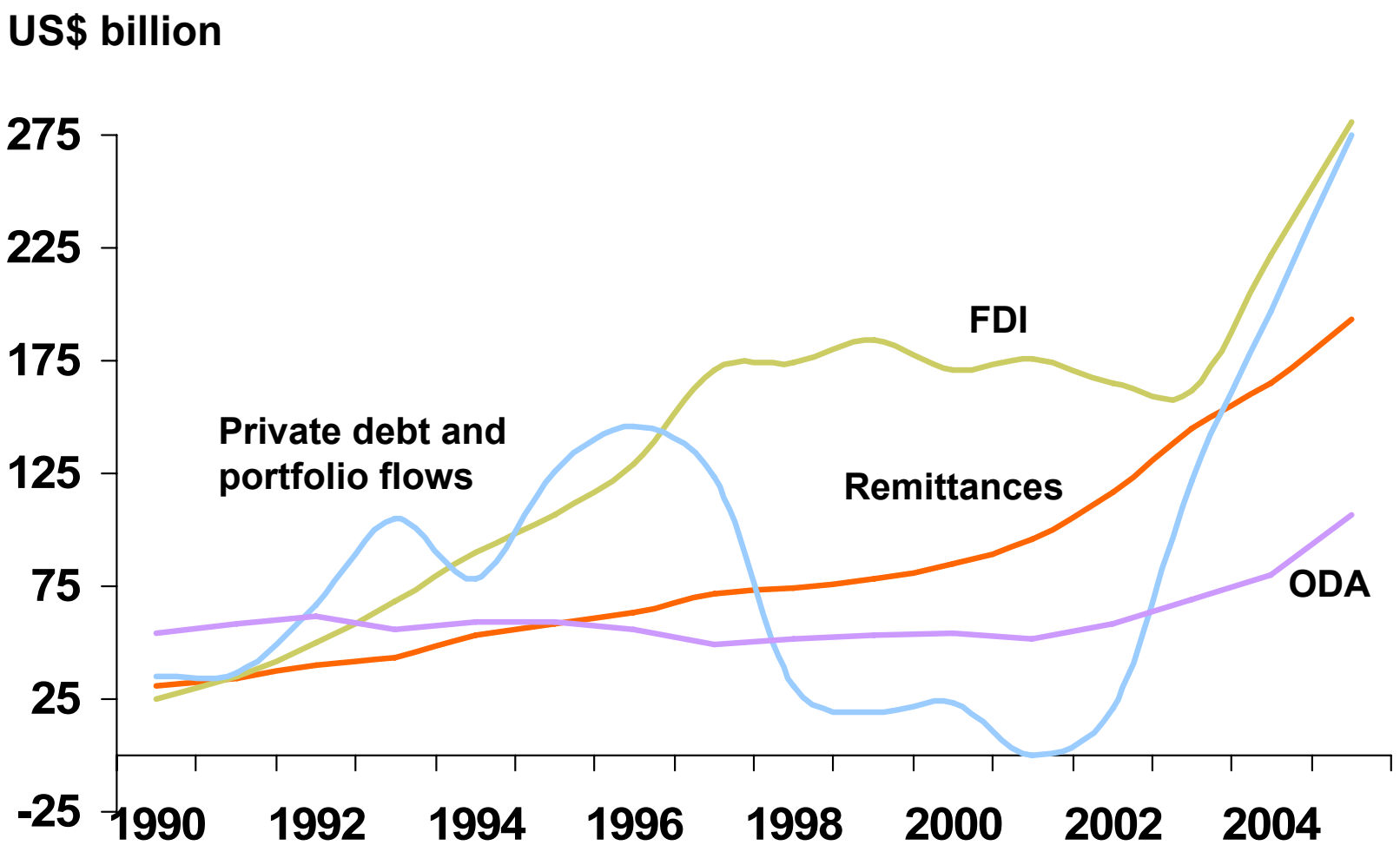
Macroeconomic Determinants of Workers' Remittances

Marta Ruiz-Arranz
International Monetary Fund
Tokyo, April 19-20

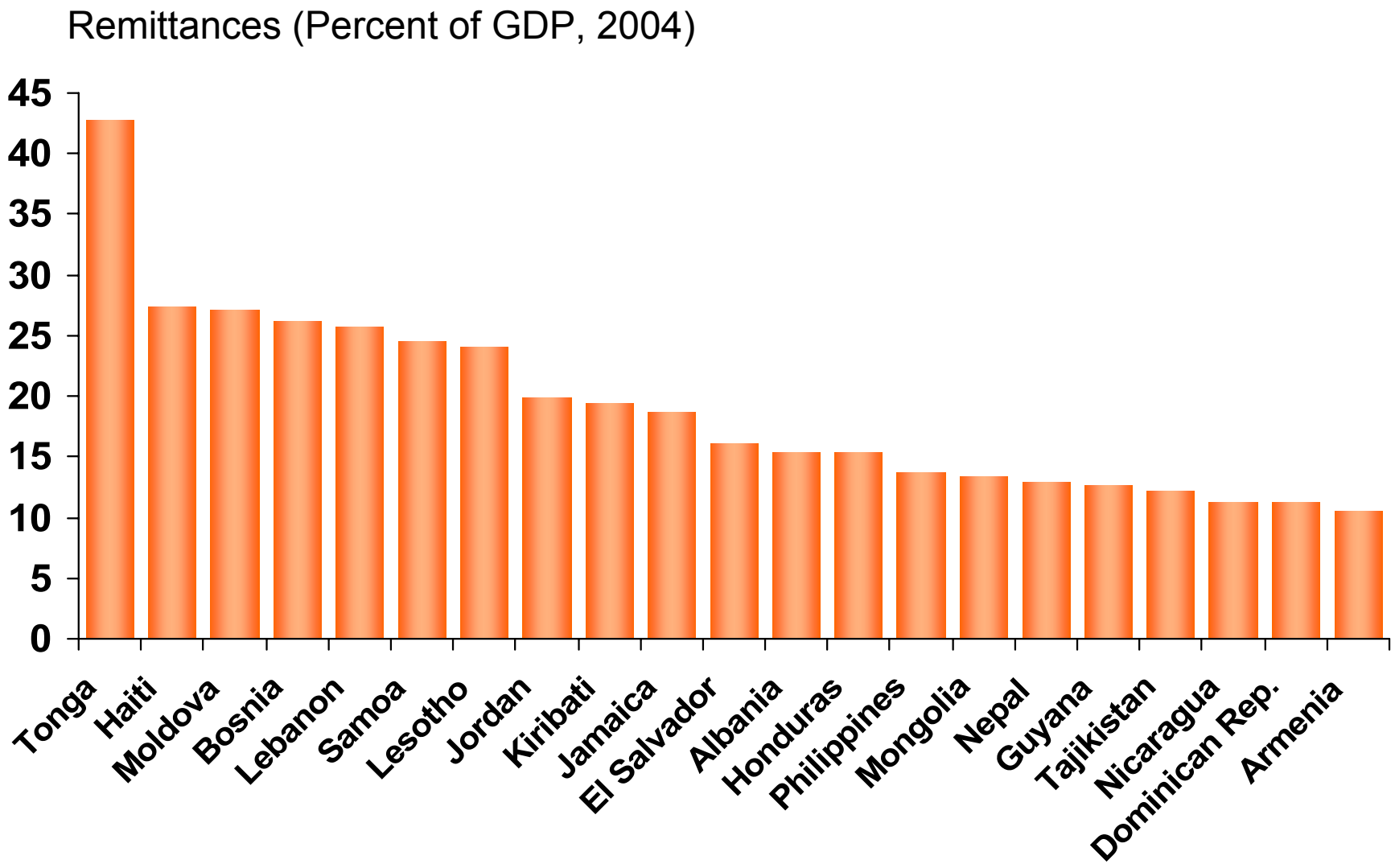
Outline

- Stylized facts about remittances
- Challenges confronting policymakers
- Cross-country analysis—A gravity model of workers' remittances
- The case of Sri Lanka—Are remittances a hedge against macroeconomic shocks?

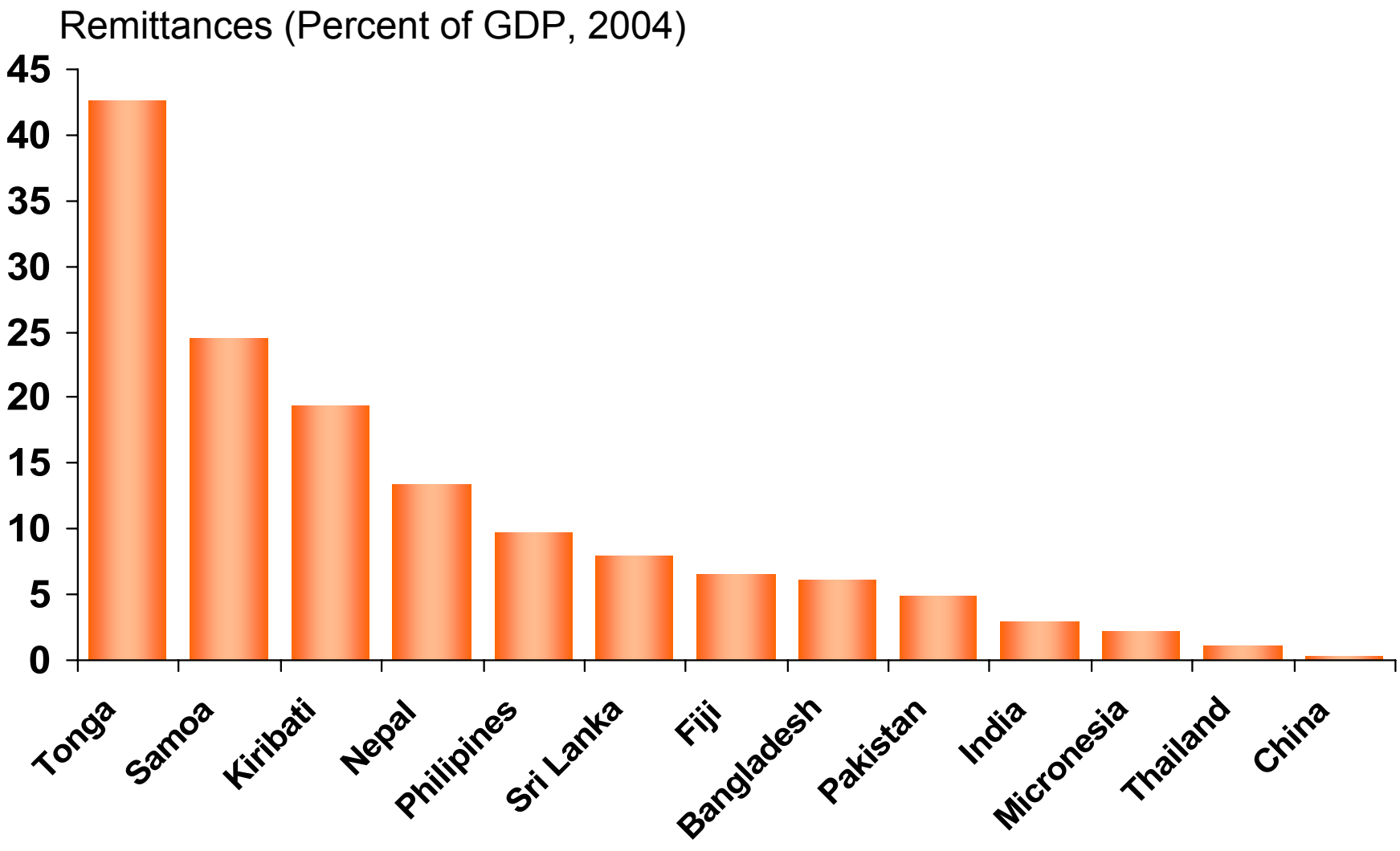
Remittances are a major source of external finance for developing countries (US$193 billion in 2005)



In over 20 developing countries, remittances account for more than 10 percent of GDP



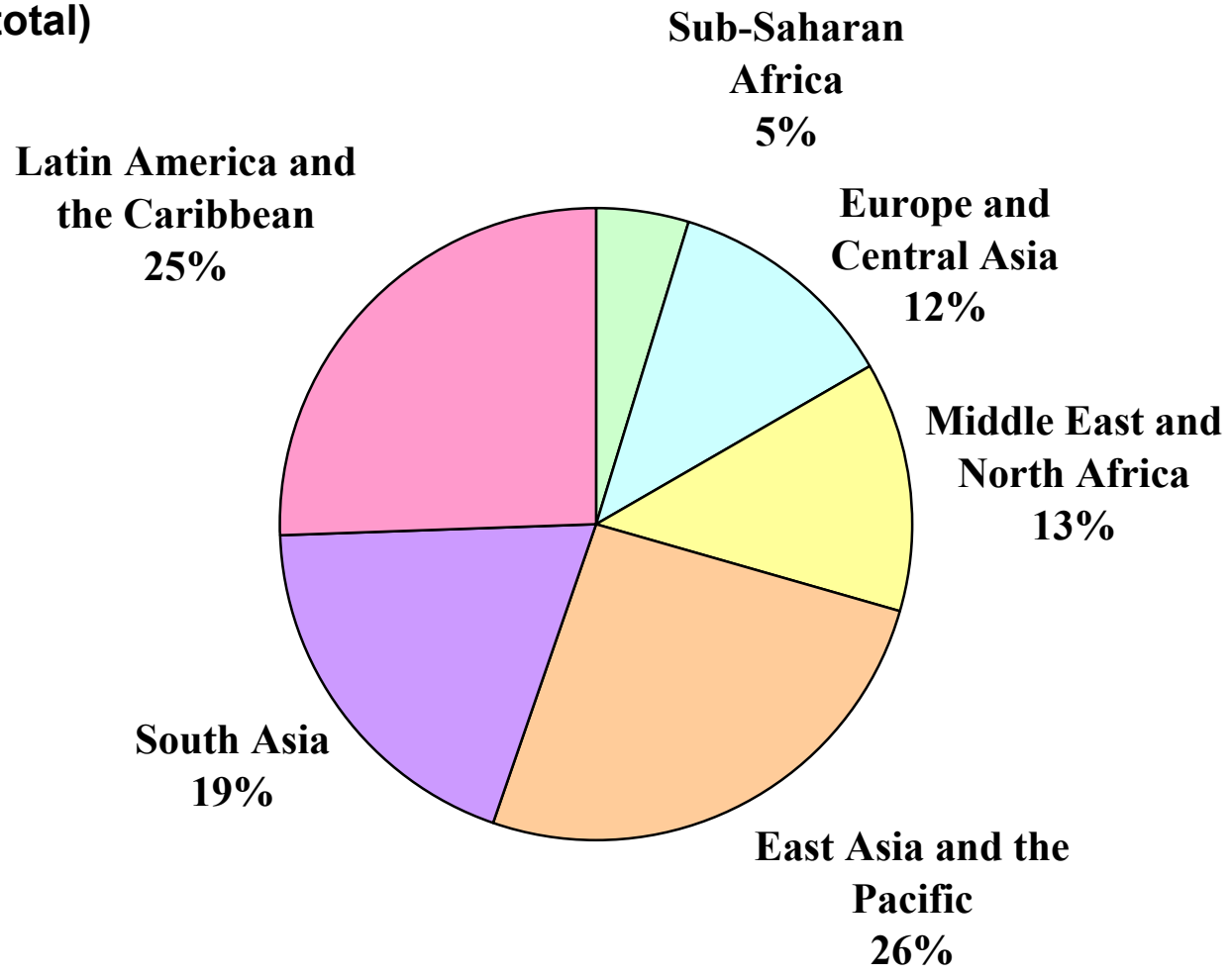
Some Asian economies are among the top recipient countries



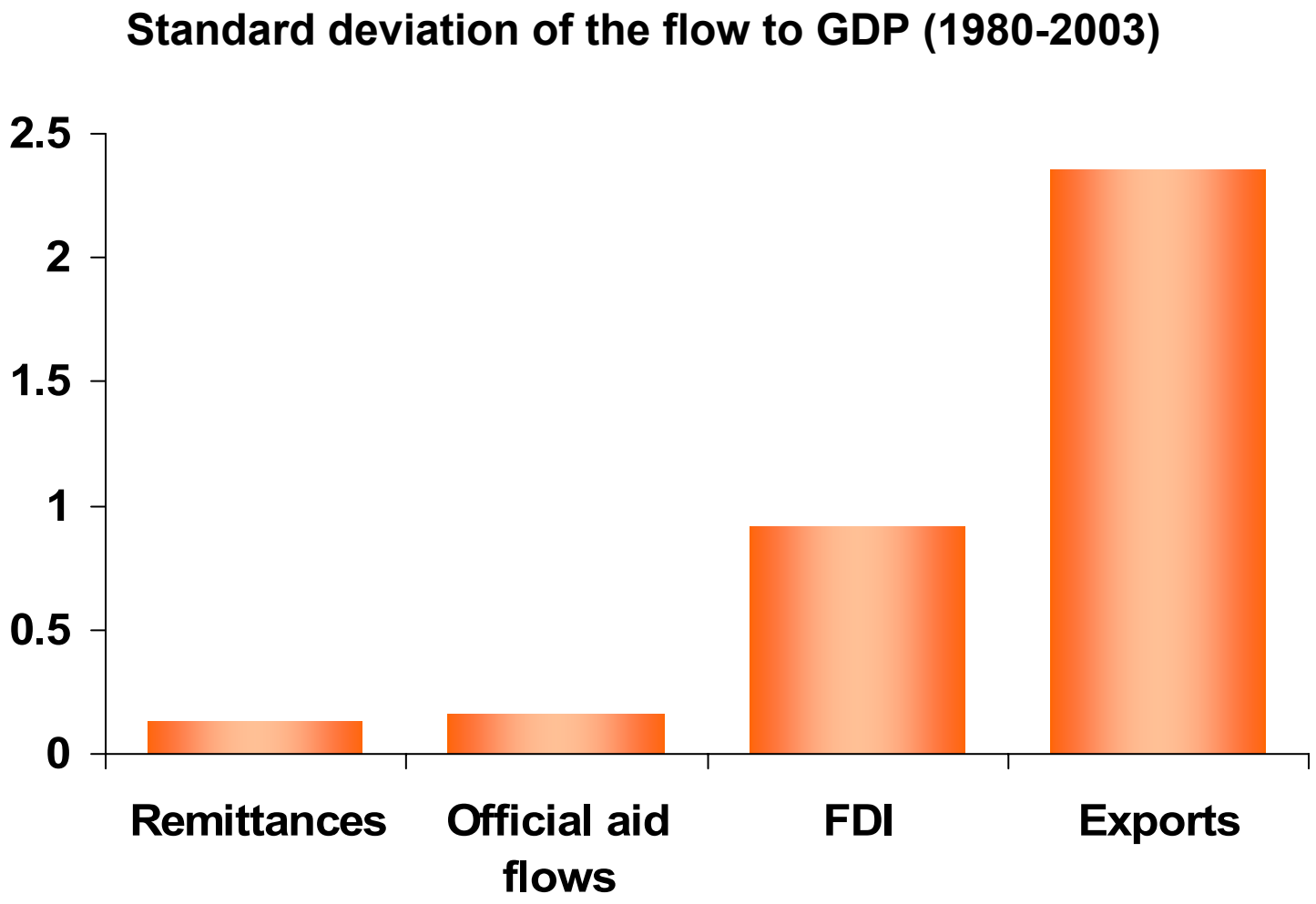
Asia and the Pacific is the main destination region for remittances

Remittances by region in 2005

(percent of total)

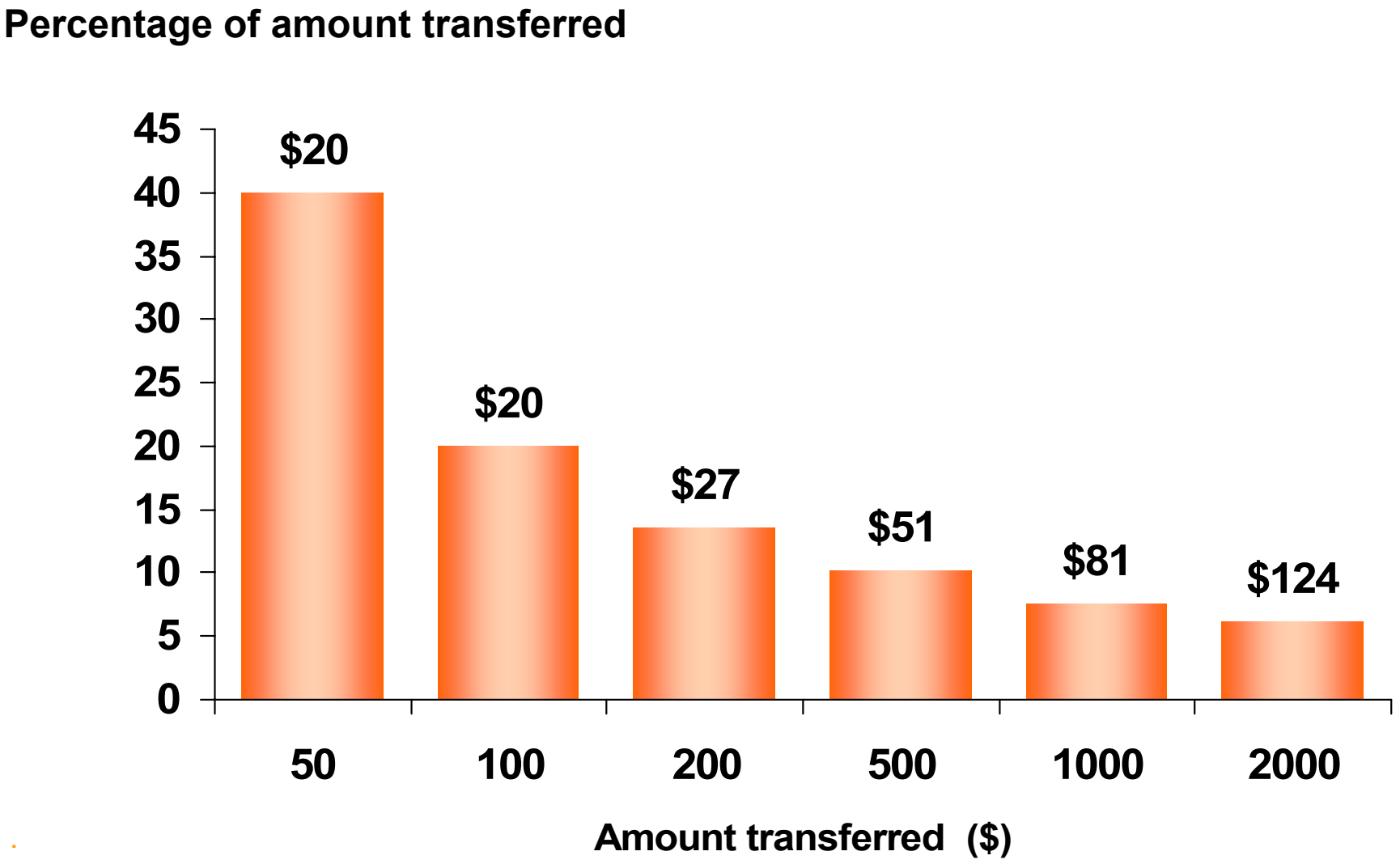


Remittance flows are less volatile than official aid, FDI, and exports



Transfer costs are very high

Western Union transfer fees from Washington, DC to Sri Lanka



Challenges confronting policymakers

- What are the macroeconomic determinants of remittances?
- What are their cyclical properties?
- Are remittances a hedge against shocks?
- What policies are likely to encourage remittance flows?

Cross-country analysis

- Create first dataset of bilateral remittance flows for a limited number of countries
- Apply a gravity model to explain remittance flows
- Shed new light on the motives to remit (altruism vs. investment considerations)
- Derive cyclical properties and role of remittances in limiting vulnerability to shocks

Data Summary

Recipient Country	Number Source Countries	Time Period	Data Coverage 1/
Bangladesh	12	1979–2004	75
Croatia	25	1997–2004	96
Indonesia	12	2003–2004	99
Kazakhstan	19	2003–2004	67
Macedonia FYR	19	1997–2004	97
Moldova	15	2003–2004	94
Philippines	31	1981–2004	85
Serbia and Montenegro	19	2000–2004	72
Slovenia	16	1994–2004	92
Tajikistan	3	2002–2004	95
Thailand	21	1993–2004	97

1/ Percent of total remittances from the balance of payments covered in the dataset (average all years).

Gravity model

$$\ln R_{ijt} = \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \beta_3 \ln D_{ij} + \beta_4^{'} X_{ijt} + \eta_t + \varepsilon_{ijt}$$

i : recipient (home) country
j : sending (host) country
R_{ijt} : remittances from country j to country i
Y_{it} : nominal GDP country i
D_{ij} : distance
X_{ijt} : matrix of control variables

Simple model

- Remittance flows between two countries are proportional to their economic size (GDP) and inversely proportional to distance
- Matrix X_{ijt} consists of:
  - GDP per capita country *i*
  - GDP per capita country *j*
  - Common language
  - Shared border

Gravity estimates

Dependent variable is Log Remittance Flows from country *i* to country *j*

Log GDP_ i	0.846 ***	1.243 ***	3.952 ***	0.882 ***
	(0.04)	(0.10)	(1.45)	(0.09)
Log GDP _ j	0.45 ***	0.581 ***	0.065	0.392 ***
	(0.02)	(0.03)	(0.42)	(0.07)
Log GDP per capita _ i	-1.457 ***	-1.815	-3.546 ***	-1.218 ***
	(0.05)	(0.09)	(1.34)	(0.11)
Log GDP per capita _ j	0.287 ***	0.086	1.194 ***	0.539 ***
	(0.06)	(0.08)	(0.38)	(0.10)
Log Distance	-0.53 ***	-0.508 ***	-0.245 ***	-0.544 ***
	(0.05)	(0.05)	(0.07)	(0.13)
Shared border	-0.61 ***	-0.548 ***	-0.055	-0.411
	(0.18)	(0.18)	(0.19)	(0.40)
Common language	0.529 ***	0.594 ***	0.596 ***	0.472 *
	(0.09)	(0.09)	(0.12)	(0.27)
Constant	7.177 ***	11.128 ***	0.831	2.494
	(0.86)	(1.08)	(3.86)	(1.66)
Observations	1,639	1,639	1,639	1,639
R-squared	0.53	0.58	0.73	0.5
Number of country-pairs	...	...	...	190
Specific effects	No	Region (home and host) fixed effects	Country (home and host) fixed effects	Country-pair random effects

Findings simple model

- Gravity model very powerful in explaining remittance flows
- Few gravity variables can explain over half of the variation in remittance flows
- Results in line with gravity models for trade

Extended model

- Matrix X_{ijt} contains a richer set of determinants of remittances
- Fleshes out what is captured by country-specific fixed or random effects
- Minimizes the bias that imposing fixed effects introduces into a dynamic panel
- Extended model includes 1108 observations

Results extended model

Dependent variable is log remittance flows from country *j* to country *i*

Log GDP *i*	1.281***
Log GDP *j*	0.168***
Log GDP per capita *i*	-2.835***
Log GDP per capita *j*	0.339***
Log distance	-0.346***
Shared border	-0.492***
Common language	0.264**
Colonial relationship	0.981***
Log stock of migrants *j*	0.362***
Exports of *i* to *j*	0.167***
Imports of *i* from *j*	-0.042
Dependency ratio *i*	0.079***
Natural disaster *i*	0.075
Real per capita growth i	0.028*
Real per capita growth *j*	-0.017*
Stock market returns differential	0.001
Credit to GDP *i*	0.019***
Credit to GDP *j*	0.001
Inflation differential	0.049***
Depreciation of *i* relative to *j*	-0.007*
Restrictions in current account *i*	-0.503***
Dual exchange rate *i*	-0.125
Dual exchange rate *j*	-1.588**
Asia *i*	-4.464***

Country ties matter

- Remittance flows between countries with a common colonial history are 50% larger than flows between unrelated countries
- More remittances are received from trade partners, particularly from main export destinations

The evidence on the motives to remit are mixed

- Pro altruism hypothesis:
  - A higher dependency ratio is associated with higher remittance receipts
  - High inflation in the home country is associated with higher remittance receipts
  - Remittances don't seem to respond to higher stock market returns

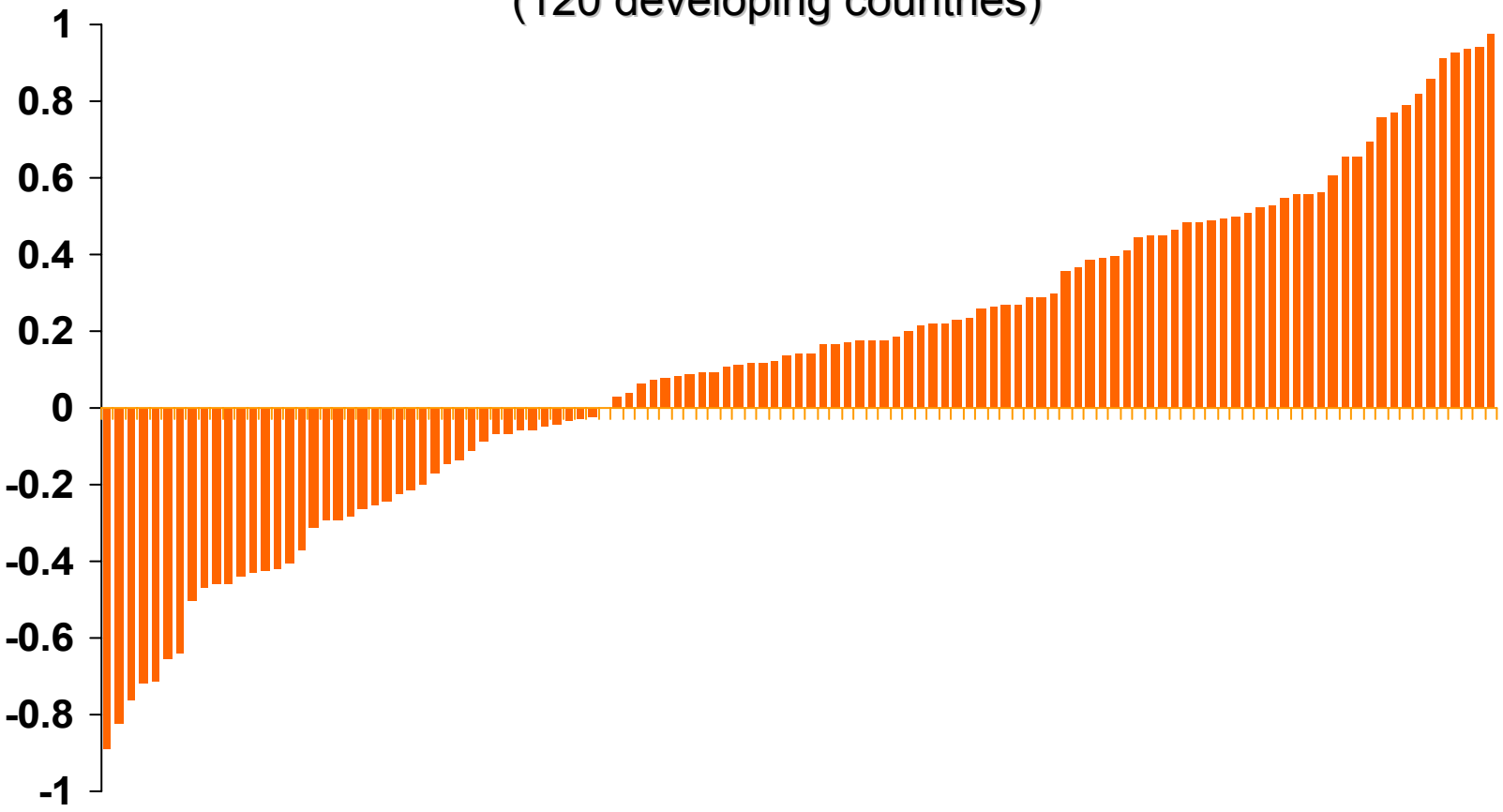
But altruism may be less important than commonly believed

- Con altruism hypothesis (pro investment hypothesis):
  - Remittances do not increase following natural disasters in the home country
  - Strong growth in the worker's home country increases the amount sent home
  - Strong growth in the worker's host country reduces the amount sent home

In more than 60 percent of the developing world, remittances are pro-cyclical: they increase when economic conditions in home country improve

Country correlations between the cyclical components of remittances and real GDP

(120 developing countries)



The role of remittances as shock-absorber may be limited

- They are pro-cyclical
- They do not seem to increase following natural disasters
- They are positively correlated with exports
- When the home currency weakens, remittance receipts decline

Official remittances respond to transaction costs

- Financial development in the home country fosters remittances
- Countries with current account restrictions receive 40 percent less remittances
- About 80 percent fewer remittances are sent from countries with dual exchange rates

Political stability and business climate matter

- A reduced sample of 891 bilateral observations includes a variable for political stability and business climate
- Less political risk in the home country is associated with larger remittances
- Less political risk in the host country is associated with smaller remittances

Summary

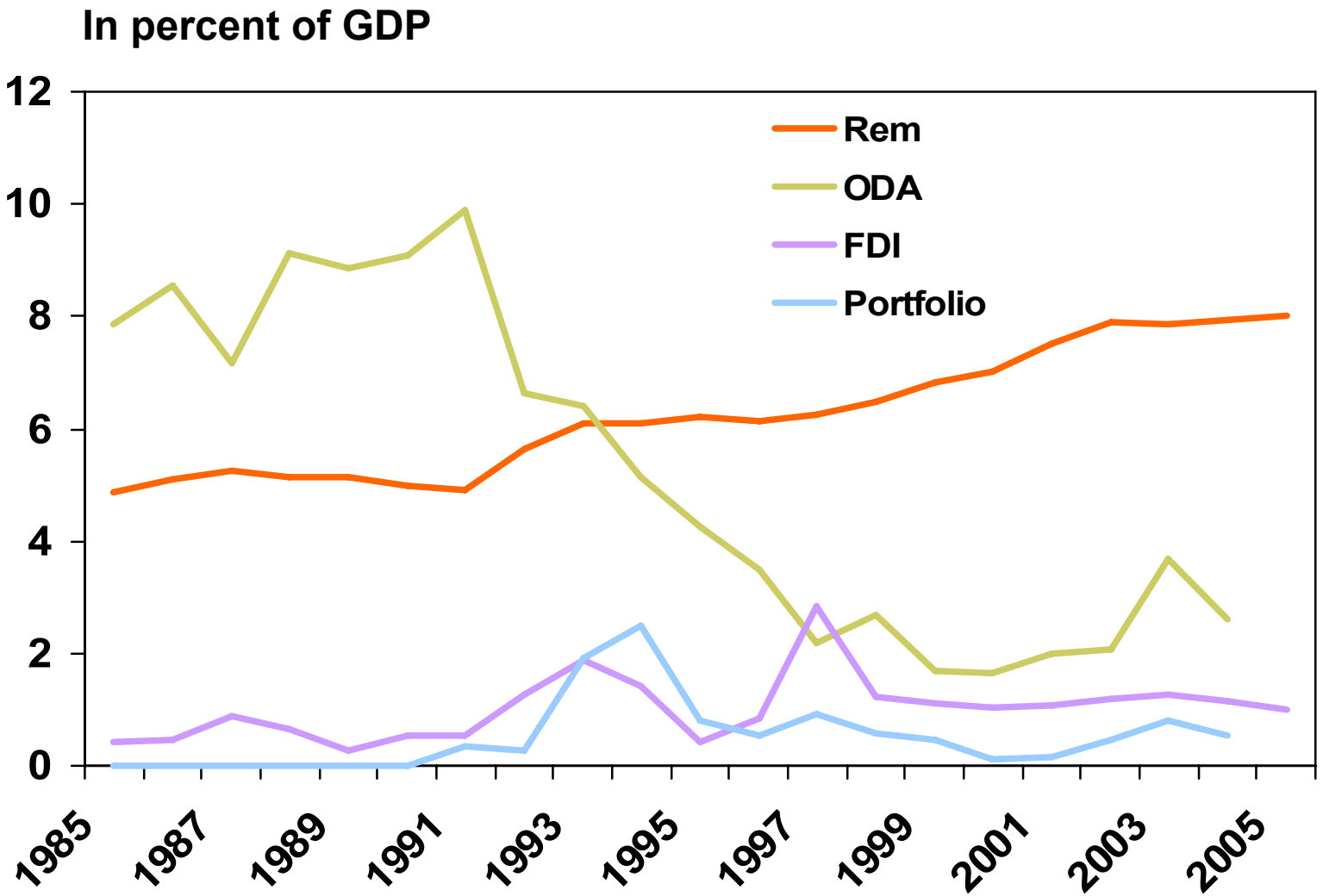
- Gravity model is very powerful in explaining remittance flows
- Altruism less of a factor than commonly believed. Evidence of an investment motive
- The role of remittances as a shock absorber may be limited
- Remittance receipts are sensitive to the political and business climate, transaction costs and the level of financial development

Policy implications

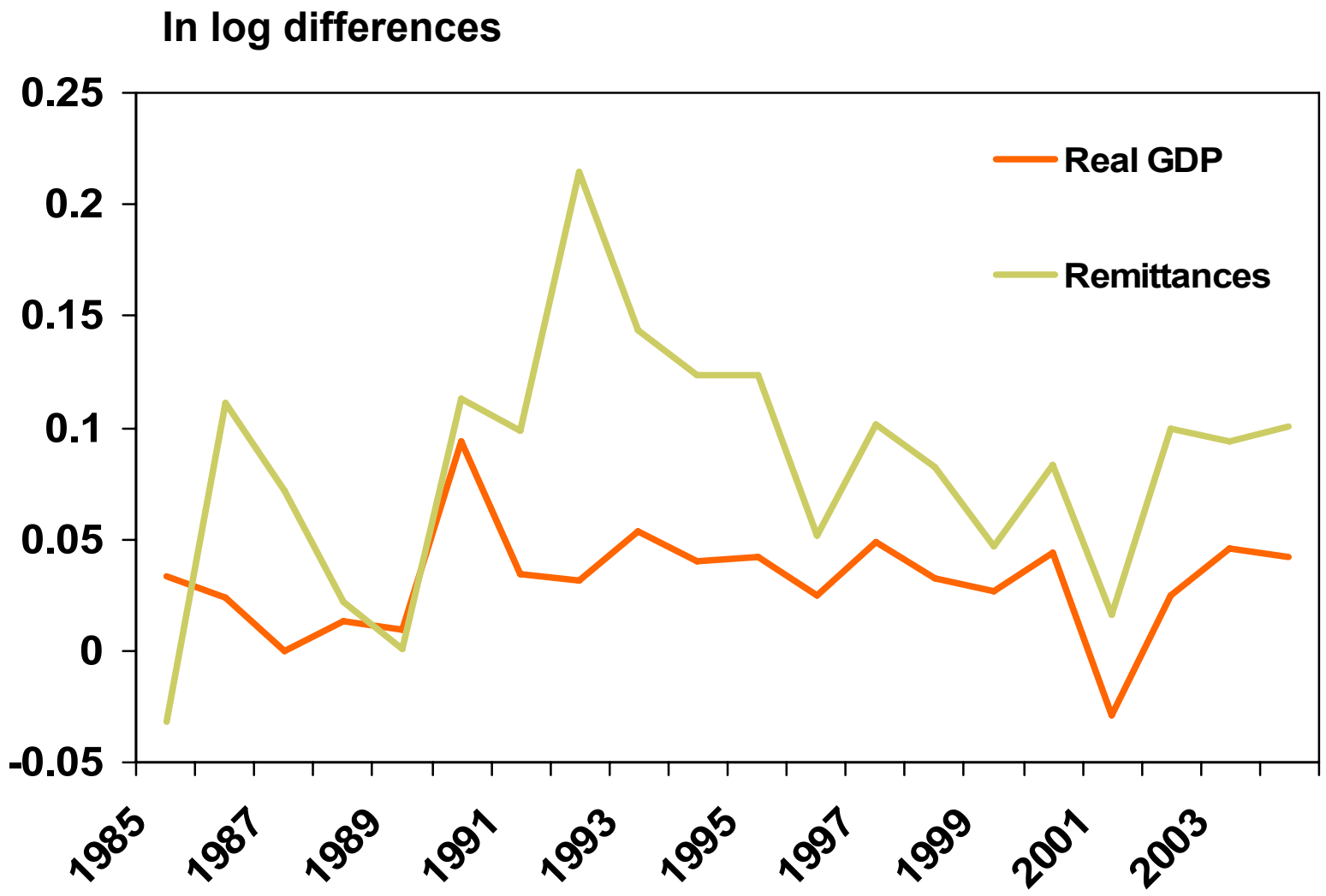
- Remittances are a welcome source of foreign financing and should be promoted
- They can be encouraged by fostering financial sector development and reducing transaction costs, improving business and political climate
- Remittance can yield important benefits, but are no panacea—they cannot substitute for good policies and structural reform

Are workers' remittances a hedge against macroeconomic shocks? The case of Sri Lanka

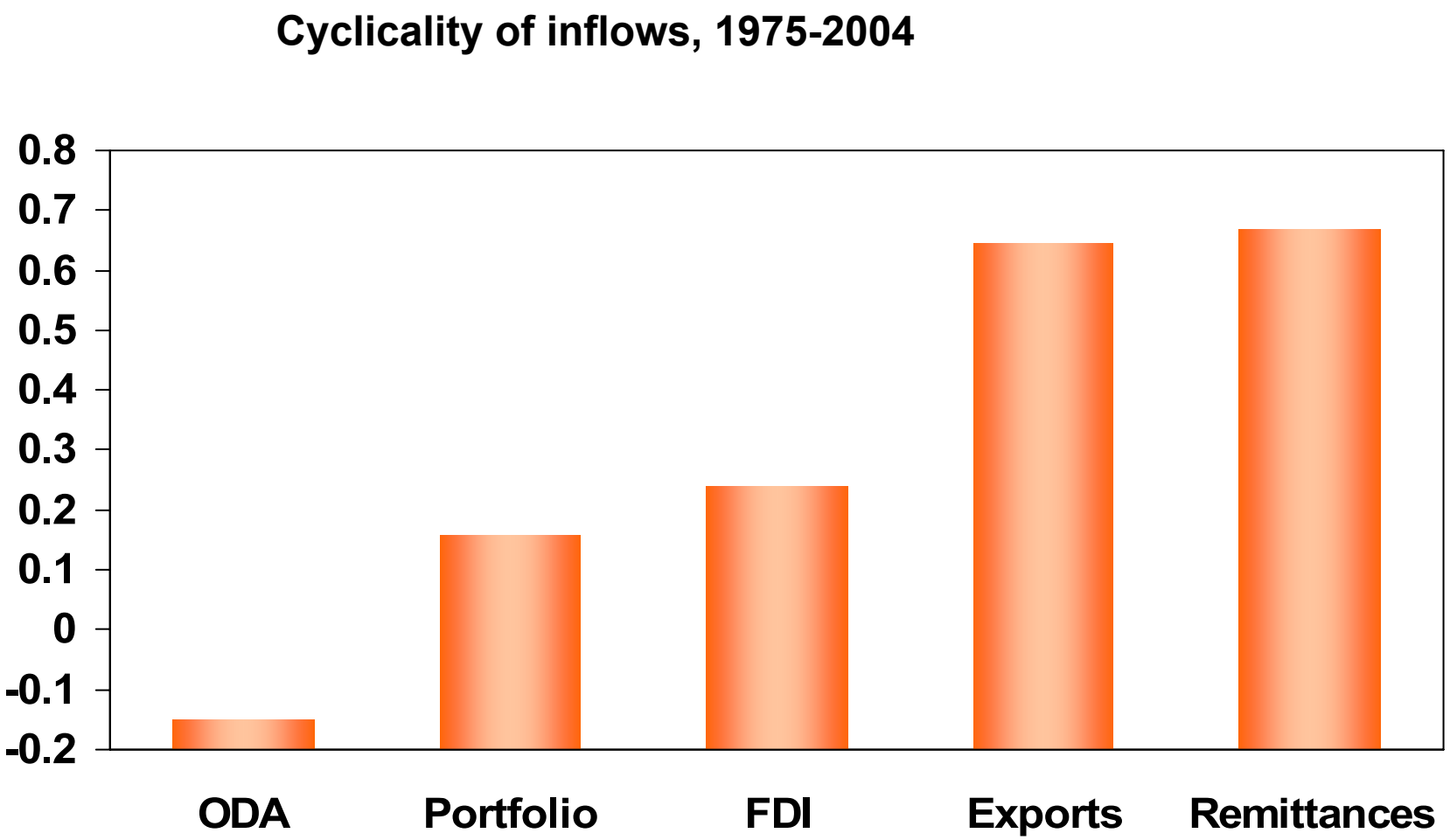
Remittances constitute the largest source of foreign exchange after exports in Sri Lanka



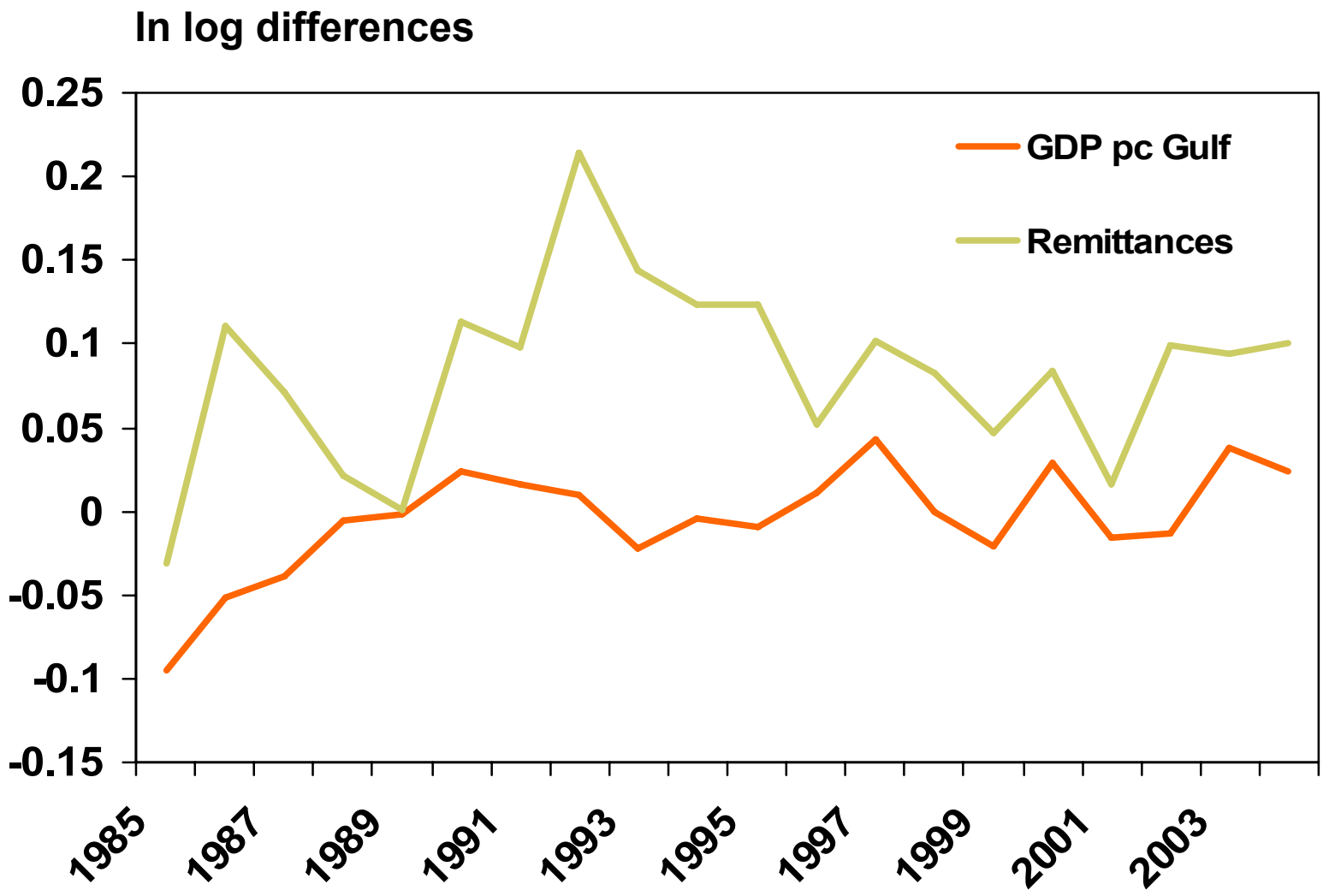
Since the mid-1990s, remittances seem to be strongly pro-cyclical



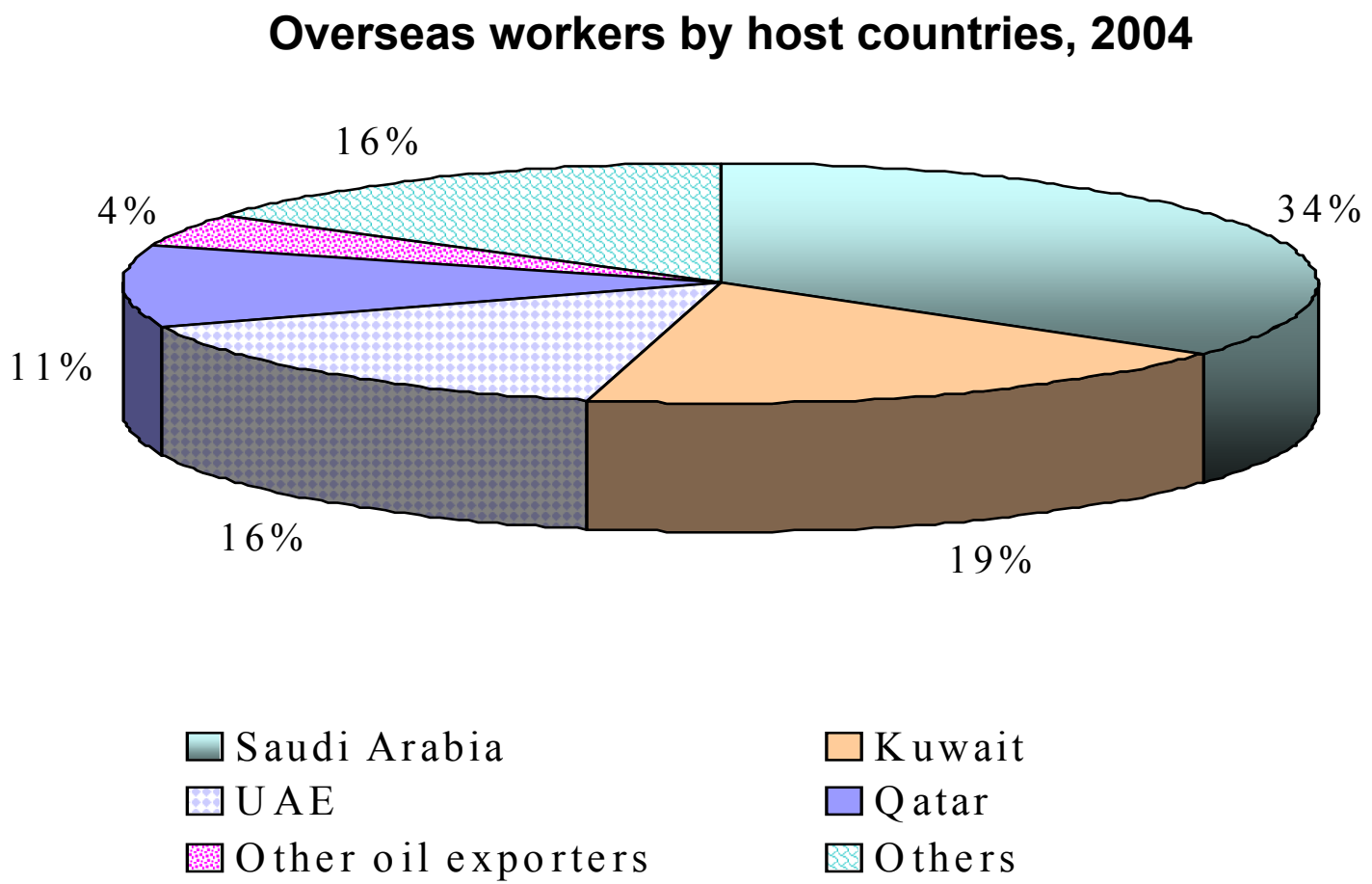
Remittances are the most pro-cyclical of all foreign inflows



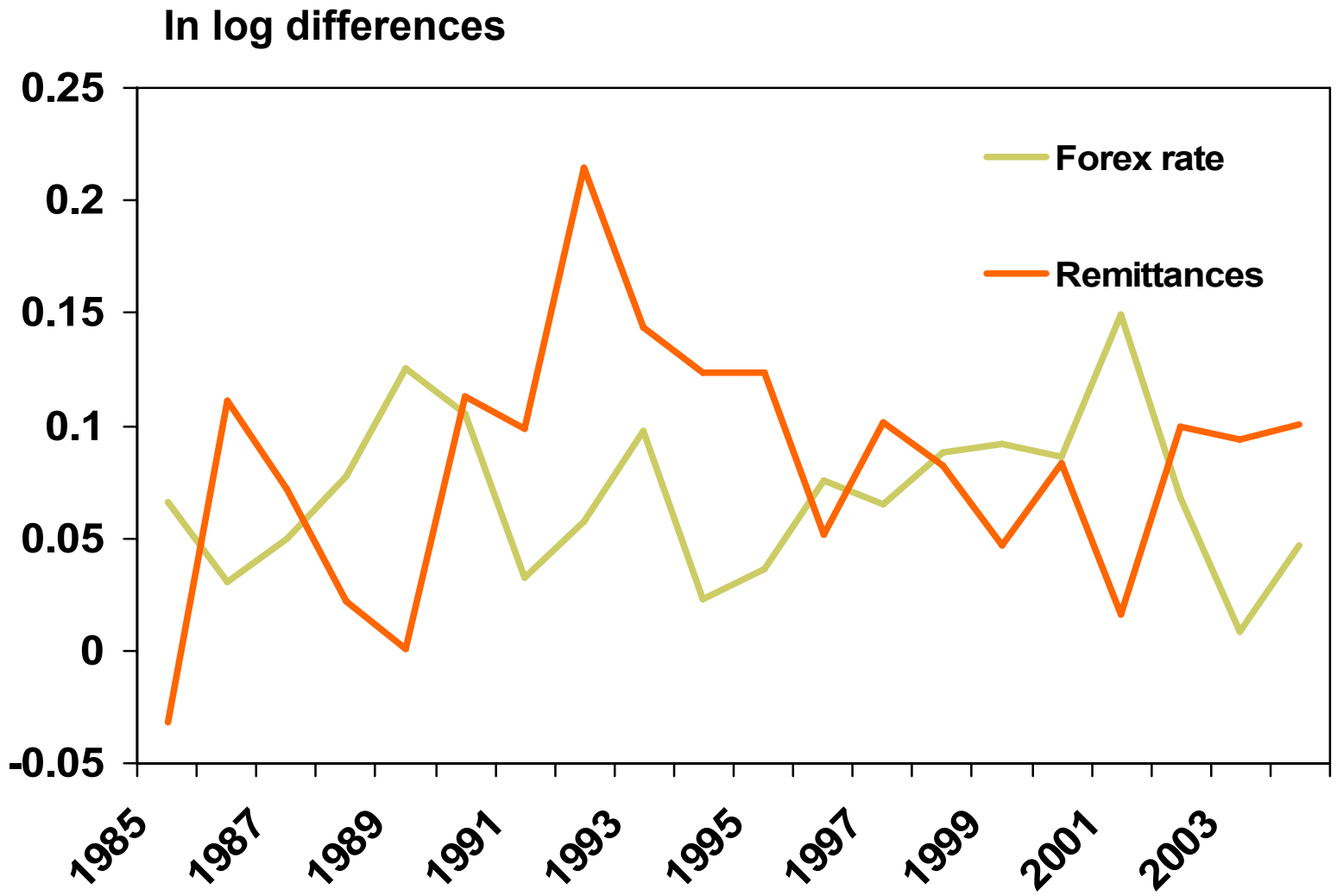
Remittances are correlated with the GDP per capita of the Gulf states



Close to 85 percent of migrants reside in Gulf states (net oil exporters)



A weaker currency seems to be associated with lower remittances

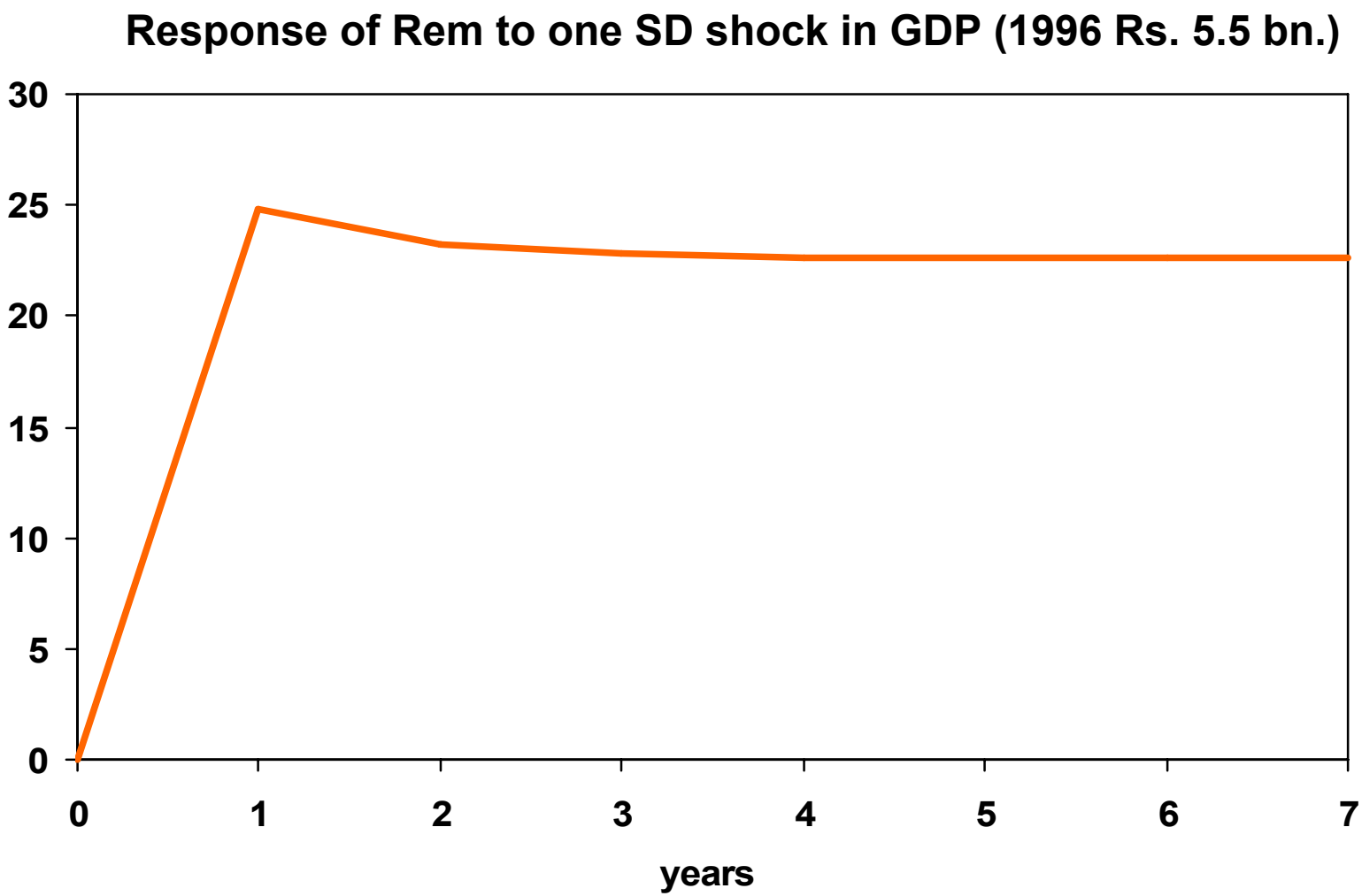


Econometric Analysis

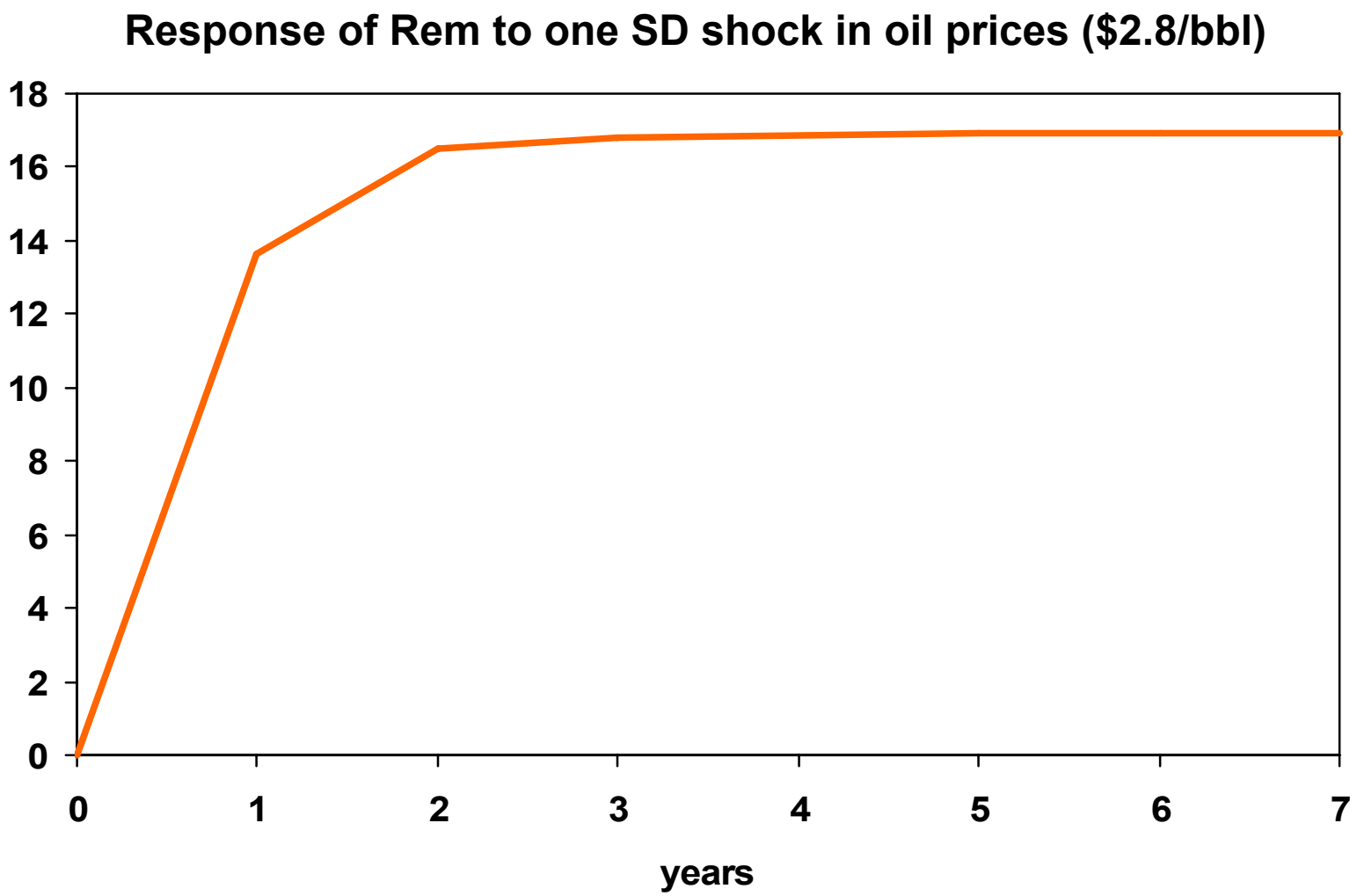
- Vector Error Correction model using quarterly data 1996-2004

- Objective: to determine the response of remittance receipts to macroeconomic shocks (real GDP, CPI, exchange rate, interest rates, oil prices)

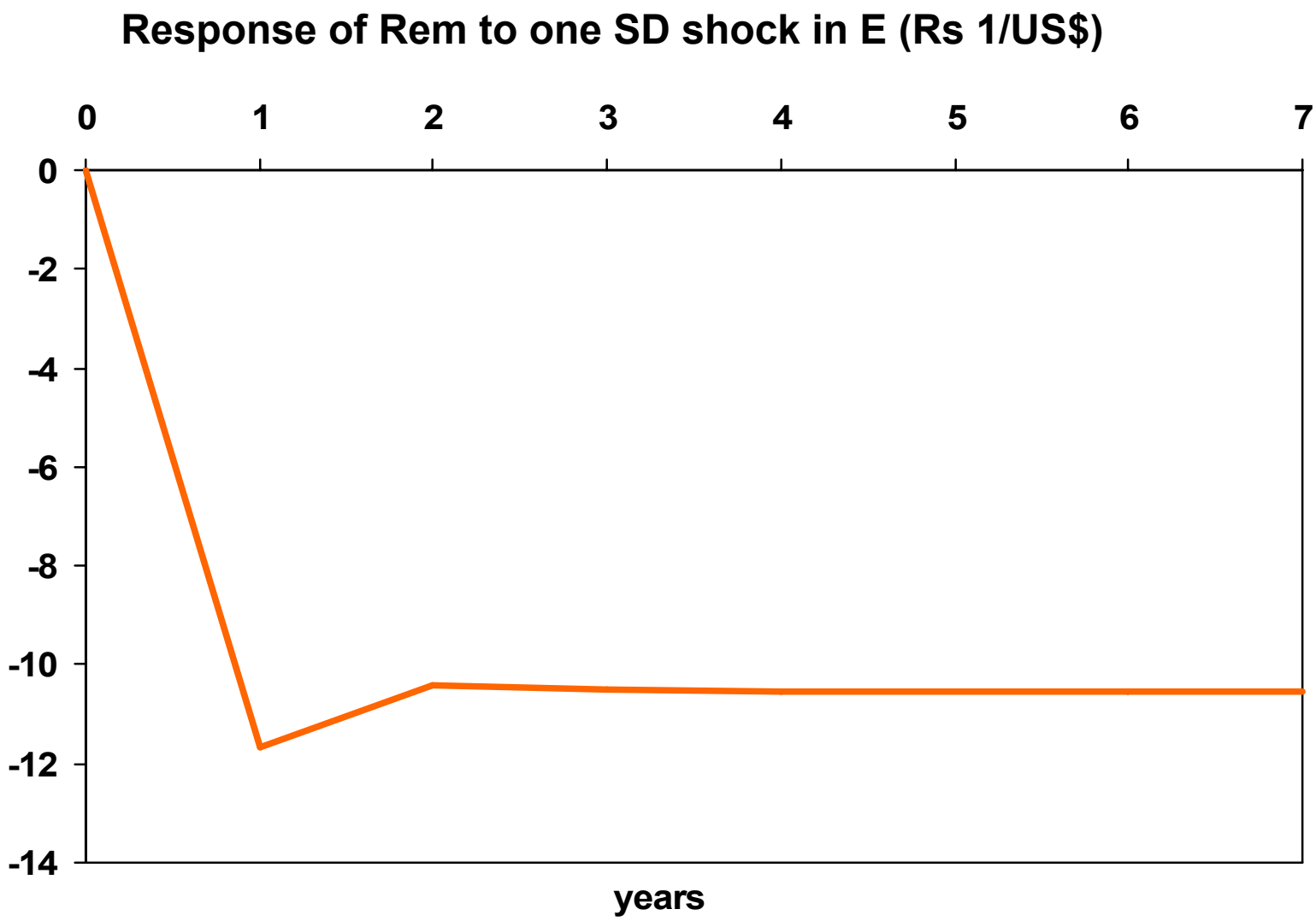
Remittances are procyclical



Remittances increase with oil prices



Remittances fall when the currency weakens



Conclusions

- Remittances are positively correlated with real GDP undermining their impact as a shock-absorber
- They can offer some protection against oil shocks
- They fall when currency weakens, providing little insurance against balance of payments crisis
- They do not respond positively to relative rates of return
- Inflation does not seem to have any impact