MACROECONOMIC DETERMINANTS OF WORKERS’ REMITTANCES

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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.

Remittances (Percent of GDP, 2004)

- Tonga
- Samoa
- Kiribati
- Nepal
- Philippines
- Sri Lanka
- Fiji
- Bangladesh
- Pakistan
- India
- Micronesia
- Thailand
- China
Asia and the Pacific is the main destination region for remittances.

Remittances by region in 2005 (percent of total)

- East Asia and the Pacific: 26%
- Latin America and the Caribbean: 25%
- South Asia: 19%
- Middle East and North Africa: 13%
- Europe and Central Asia: 12%
- Sub-Saharan Africa: 5%
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

Percentage of amount transferred

<table>
<thead>
<tr>
<th>Amount transferred ($)</th>
<th>Percentage of amount transferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>$20</td>
</tr>
<tr>
<td>100</td>
<td>$20</td>
</tr>
<tr>
<td>200</td>
<td>$27</td>
</tr>
<tr>
<td>500</td>
<td>$51</td>
</tr>
<tr>
<td>1000</td>
<td>$81</td>
</tr>
<tr>
<td>2000</td>
<td>$124</td>
</tr>
</tbody>
</table>
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

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

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
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 $j$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log GDP _i</td>
<td>0.846 ***</td>
<td>0.04</td>
<td>21.03</td>
<td>0.0000</td>
</tr>
<tr>
<td>Log GDP _j</td>
<td>0.45 ***</td>
<td>0.02</td>
<td>20.90</td>
<td>0.0000</td>
</tr>
<tr>
<td>Log GDP per capita _i</td>
<td>-1.457 ***</td>
<td>0.05</td>
<td>-30.83</td>
<td>0.0000</td>
</tr>
<tr>
<td>Log GDP per capita _j</td>
<td>0.287 ***</td>
<td>0.06</td>
<td>19.89</td>
<td>0.0000</td>
</tr>
<tr>
<td>Log Distance</td>
<td>-0.53 ***</td>
<td>0.05</td>
<td>-10.47</td>
<td>0.0000</td>
</tr>
<tr>
<td>Shared border</td>
<td>-0.61 ***</td>
<td>0.18</td>
<td>-8.91</td>
<td>0.0000</td>
</tr>
<tr>
<td>Common language</td>
<td>0.529 ***</td>
<td>0.09</td>
<td>7.16</td>
<td>0.0000</td>
</tr>
<tr>
<td>Constant</td>
<td>7.177 ***</td>
<td>0.86</td>
<td>14.82</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Observations 1,639  R-squared 0.53  Number of country-pairs 190

Specific effects
- No fixed effects
- 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 $i$

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

Cyclicality of inflows, 1975-2004

Graph showing the cyclicality of different types of inflows: ODA, Portfolio, FDI, Exports, and Remittances. Remittances have the highest cyclicality, followed by Exports and FDI. ODA and Portfolio have the lowest cyclicality.
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.

In log differences

Forex rate

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

Response of Rem to one SD shock in GDP (1996 Rs. 5.5 bn.)
Remittances increase with oil prices

Response of Rem to one SD shock in oil prices ($2.8/bbl)
Remittances fall when the currency weakens

Response of Rem to one SD shock in E (Rs 1/US$)
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.