How Petrobras Raises Capital From Developed Countries
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Petrobras International Finance Co.
Cayman Islands

$1bn

USA

$0

EMU

$1bn

$0

Petroleo Brasileiro SA
Brazil
How Petrobras Raises Capital From Developed Countries

- Petroleo Brasileiro SA (Brazil)
- Petrobras International Finance Co. (Cayman Islands)
- Petrobras Global Finance BV (Netherlands)
- Petrobras Global Trading BV (Netherlands)

- $5bn
- $1bn
- $1bn
- $6bn

- USA
- EMU
- $0
- $0

- Petrobras International Finance Co. (Cayman Islands)
- Petrobras Global Finance BV (Netherlands)
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- Petroleo Brasileiro SA (Brazil)
New Map of Global Capital Allocation

- How big of a deal is this?
  - Tax haven issuances account for \( \approx 10\% \) of all corporate financing, and nearly 50\% of all cross-border issuances

- Takeaways:
  - Developed market exposure to large emerging markets bigger than in official data
  - Due to tax haven issuance, China’s official NFA is twice true value
Map 27m securities from issuer (Residency) to ultimate parent (Nationality)

<table>
<thead>
<tr>
<th>Issuer</th>
<th>Residency</th>
<th>Parent</th>
<th>Nationality</th>
<th>Value ($B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Corporate bonds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petrobras Intl. Finance Co.</td>
<td>CYM</td>
<td>Petroleo Brasileiro SA</td>
<td>BRA</td>
<td>12.8</td>
</tr>
<tr>
<td>Gaz Capital SA</td>
<td>LUX</td>
<td>Gazprom PJSC</td>
<td>RUS</td>
<td>29.7</td>
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<tr>
<td><strong>B. Equities</strong></td>
<td></td>
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<tr>
<td>Alibaba Group Holding Ltd.</td>
<td>CYM</td>
<td>Alibaba Group Holding Ltd.</td>
<td>CHN</td>
<td>441.6</td>
</tr>
<tr>
<td>Medtronic Plc</td>
<td>IRL</td>
<td>Medtronic Plc</td>
<td>USA</td>
<td>85.7</td>
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Reallocation Matrices

- Merge mapping with Morningstar data on mutual fund and ETF positions

- Key assumption: Within each year, asset class, and bilateral country pair, fund holdings are representative of the universe of portfolio investment
  - Verified for US insurance holdings and Norwegian sovereign wealth fund

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## Restating TIC for the US: Corporate Bonds

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<th>Δ</th>
<th>Tax Haven Only</th>
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<tbody>
<tr>
<td>Brazil</td>
<td>8</td>
<td>50</td>
<td>42</td>
<td>68</td>
<td>59</td>
</tr>
<tr>
<td>Bermuda</td>
<td>30</td>
<td>0</td>
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<tr>
<td>Cayman Islands</td>
<td>80</td>
<td>1</td>
<td>-79</td>
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<tr>
<td>China</td>
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<td>47</td>
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<td>-1</td>
<td>9</td>
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<tr>
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<tr>
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Developed Market Investment in BRICS Debt

Share of External Bond Portfolio in BRICS
Investing Country
Nationality
Residency
AUS
CAN
CHE
DNK
EMU
GBR
NOR
SWE
USA

0
0.02
0.04
0.06
0.08
0.1

Share of External Bond Portfolio in BRICS

Nationality
Residency
Developed Market Investment in Chinese Equity

Share of External Equity Portfolio in China

Investing Country

Nationality

Residency

$541B
Standard vs. VIE Structure

Outside China

Inside China

Operating Company

Chinese Shareholders

Foreign Shareholders

Standard Structure
Standard vs. VIE Structure

**Standard Structure**
- Foreign Shareholders
- Operating Company
- Chinese Shareholders

**VIE Structure**
- Foreign Shareholders
- Listed Company
- SPV
- Operating Company
- WFOE
- Chinese Owners
- Contracts

Outside China

Inside China
Implications for China’s Net Foreign Assets (NFA)

- Net Foreign Asset Position (NFA) captures net claims on RoW:

\[ NFA = A - L \]
\[ \Delta NFA = CA + \text{Valuation Changes} \]

- VIE structure causes understatement of \( L \)
  - Missing valuation changes
Implications for China’s Net Foreign Assets (NFA)

**Standard Structure**

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*China’s portfolio liabilities, linked to stock price*
Implications for China’s Net Foreign Assets (NFA)

**Standard Structure**

- Foreign Shareholders
- China’s portfolio liabilities, linked to stock price
- Operating Company
- Chinese Shareholders

**VIE Structure**

- Foreign Shareholders
- Listed Company
- China’s liabilities, not linked to stock price
- Operating Company
- Chinese Owners
- WFOE
- Contracts
- SPV

Outside China

Inside China
Valuation Effects Not Captured in China’s Liabilities

- Focusing on surge in value of VIEs from 2016:Q4 to 2018:Q1:
NFA Mismeasurement is Large

China NFA, Share of GDP

- Official

- 2005
- 2007
- 2009
- 2011
- 2013
- 2015
- 2017

$1.4T$
NFA Mismeasurement is Large

![Graph showing NFA measurement over time]

- **China NFA, Share of GDP**
- **Official**
- **With VIE Adjustment, Baseline**
- **Double Chinese Holdings**
- **Assets Correctly Marked**

![$1.1T$ at the end of the graph]
Much More in Paper and Online

- Currency composition of emerging market bonds
- Spurious foreign investment
- Sales-based reallocation
- Full reallocation and issuance matrices by country, year, asset class
- Disaggregated bilateral investment data (currency, industry, by asset class)
- Analysis of US insurance and Norwegian sovereign wealth fund
Conclusion

- Novel view of global capital allocation

- Methodology:
  - Pierce veil of tax havens to measure true risk exposures
  - Provide new data and restate commonly used public datasets

- Takeaways:
  - Flows from developed market investors to EMs underestimated
  - Drives huge NFA mismeasurement in China (elsewhere?)

- Follow Global Capital Allocation Project, data, code: globalcapitalallocation.com