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Robin Koepke and Simon Paetzold
Agenda

1. Main Takeaways

2. Overview of Capital Flow Data
   1. Key Capital Flow Data Sources
   3. Conceptual Differences between EPFR and IIF Data

3. Capital Flow Data in the Literature and Policy Documents

4. Nowcasting Horse-Race of Portfolio Flows
Main Takeaways

1. Navigating capital flow data is difficult due to misconceptions and measurement limitations of the Balance of Payments (BoP) accounting framework.

2. Available datasets on high-frequency portfolio flows to emerging markets differ widely in conceptual scope, data coverage, and country sample.

3. Papers on drivers of high-frequency portfolio flows largely used fund flow data and may have overemphasized global push factors.

4. High-frequency portfolio flows data have significant predictive content for quarterly BoP data, especially proxies that are consistent with BoP accounting principles.
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Availability of Capital Flow Data Has Improved in Recent Years
Comparing Key Capital Flow Data Sources (1)

Emerging Market Portfolio Research (EPFR), Institute for International Finance (IIF), Bank for International Settlements (BIS).
Comparing Key Capital Flow Data Sources (2)

IMF Balance of Payments Statistics

- Quarterly/Annual Data
  - Comprehensive coverage and well-established and well-defined methodology
  - Statistical break in 2005-2008 due to BPM5/BPM6 transition (IMF publishes historical data in BPM6 format)

BIS Data

- Locational Banking Statistics
  - Comprehensive coverage of cross-border banking activity with data on immediate/ultimate counter party
  - Flows are constructed based on Stock data, adjusted for FX valuation

- Consolidated Banking Statistics
  - Additional data on guarantor consolidated basis
  - No flow data constructed
Comparing Key Capital Flow Data Sources (3)

**IIF Data**

- **Daily Flows**
  - Debt flows for some countries only cover local currency and/or sovereign bonds; primary bond purchases and maturing bonds excluded

- **Monthly Tracker**
  - Econometric Model to replicate BoP flows
  - Data for last 2-3 months get revised

- **Quarterly/Annual Data**
  - Limited country coverage compared to the BoP but includes forecast of capital flows

**EPFR Data**

- **Weekly/Monthly Flows**
  - Conceptually different from BoP flows
  - Granular data available by currency denomination, fund domicile, investor type, among others
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Misconceptions of the Balance of Payments Framework: Three Sources

1. Ambiguous terminology on gross vs. net flows

2. Sign conventions reversed for changes in financial assets

3. Mixing up capital flows components

Net Capital Flows (Financial Account Balance)

Net Change in Assets (Resident Outward Investment) - Net Change in Liabilities (Non-Resident Inward Investment) = Net Capital Flows

FDI + Portfolio Equity + Portfolio Debt + Other Investment = Net Change in Liabilities
Measurement Limitations of the Balance of Payments Framework: Residency vs. Nationality

Distortions of residency-based BoP accounting framework

- Corporate offshore borrowing
- Corporate tax optimization
- Portfolio allocation via financial centers and investment funds

Without distortions advanced economy portfolio investments in emerging markets in 2017 roughly doubles.

Source: Data based on Coppolla et al. (2020).
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Comparison Between IIF Portfolio Flows and EPFR Fund Flows

IIF and EPFR data consistently signal turning points.

Magnitude of flows in IIF and EPFR data shows discrepancies.
**Available Datasets on High-Frequency Portfolio Flows Differ Widely in Scope**

<table>
<thead>
<tr>
<th>Conceptual Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>• IIF’s monthly and daily data aim to record an inflow if there is a transaction between a non-resident and a resident.</td>
</tr>
<tr>
<td>• Flows into investment funds do not necessarily result in cross-border transactions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>• IIF monthly and especially some of the country level daily flows data do not include specific types of portfolio transactions.</td>
</tr>
<tr>
<td>• EPFR data do not cover all types of emerging market investors, only mutual funds and exchange traded funds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The emerging market universe for EPFR data is guided by which countries are included in key benchmark indices.</td>
</tr>
<tr>
<td>• The IIF country sample is additionally guided by which countries make available timely portfolio flow data at the monthly (35 countries) and daily (21 countries) frequencies.</td>
</tr>
</tbody>
</table>
Bottom Line: When to Use IIF or EPFR data?

**EPFR Data**
- Questions relating to (fund) investor behavior
- Informing asset allocation decisions

**IIF Data**
- Portfolio flows in a macroeconomic and external financing context
- Most policy-related questions
- Country level analysis
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Capital Flow Data in the Literature and Policy Documents

Data Sources in Academic Dataset 1/

- IMF BOPS: 39%
- BIS: 20%
- EPFR: 14%
- World Bank: 10%
- TIC: 6%
- Other: 11%

High Frequency Capital Flow Data in Policy Dataset, 2010-20

- EPFR Data: 67%
- IIF Data: 21%
- Other Data: 12%

Source: IMF staff calculations.

1/ The sample comprises 88 papers published since 1993. If a datasource was used less than 5 times it is grouped under "Other." Seven studies did not use capital flow data or the data source was ambiguous (not included in this figure).

Source: IMF staff calculations.
1/ The chart shows data usage in reports by G20 EMs, the IMF, World Bank, and BIS since 2010. "Other Data" includes national stock exchange and Bloomberg data.
Academic Interest in High-Frequency Data (Portfolio Flows) Has Increased since the GFC

Source: IMF staff calculations.
1/ Shaded bars show extrapolation for future years by scaling the number of papers written from 2018 until 2019H1 to the entire five-year period. Totals per time period are not equal in both charts as information for capital component type or data frequency are unavailable or ambiguous for a limited number of papers.
The Use of Fund Flow Data May Have Overemphasized Global Push Factors

BoP-Consistent Flows by Frequency

Numbers of papers by flow component and frequency focusing on pull vs push factors
EPFR Dominates High-Frequency Capital Flow Data in the Literature and Policy Reports

High Frequency Capital Flow Data in the Academic Dataset, 2010-18

- 2010-12
- 2013-15
- 2016-18

High Frequency Capital Flow Data in Financial Stability Reports, 2010-19

Source: IMF staff calculations.
1/ The chart shows 111 reports by G20 EMs, the IMF, World Bank, and BIS.

Source: IMF staff calculations.
1/ The chart shows 14 papers published since 2010.
IIF and KP Data More Closely Track Quarterly BoP Data than EPFR Data
## Description of the KP Monthly Portfolio Data

<table>
<thead>
<tr>
<th>Country</th>
<th>Components</th>
<th>Data source</th>
<th>Release lag in months (approx.)</th>
<th>Currency</th>
<th>Proxy data</th>
<th>Correlation with total BoP flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Debt/Equity</td>
<td>Central Bank of Brazil</td>
<td>1-2</td>
<td>USD</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Debt/Equity</td>
<td>Eurostat</td>
<td>2-3</td>
<td>EUR</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Chile</td>
<td>Debt/Equity</td>
<td>Central Bank of Chile</td>
<td>2-3</td>
<td>USD</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Czech Republic*</td>
<td>Debt/Equity</td>
<td>Czech National Bank</td>
<td>2-3</td>
<td>EUR</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Hungary</td>
<td>Debt/Equity</td>
<td>Eurostat</td>
<td>2-3</td>
<td>EUR</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>India**</td>
<td>Debt/Equity</td>
<td>Securities &amp; Exchange Board of India</td>
<td>0-1</td>
<td>INR</td>
<td>Y</td>
<td>0.92</td>
</tr>
<tr>
<td>Korea*</td>
<td>Debt/Equity</td>
<td>Bank of Korea</td>
<td>1-2</td>
<td>USD</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Debt/Equity</td>
<td>Bank of Lebanon</td>
<td>10-11</td>
<td>USD</td>
<td></td>
<td>0.97</td>
</tr>
<tr>
<td>Mexico</td>
<td>Debt/Equity</td>
<td>Bank of Mexico</td>
<td>3-4</td>
<td>USD</td>
<td>Y</td>
<td>0.86</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Debt/Equity</td>
<td>State Bank of Pakistan</td>
<td>1-2</td>
<td>USD</td>
<td></td>
<td>0.98</td>
</tr>
<tr>
<td>Philippines</td>
<td>Debt/Equity</td>
<td>Central Bank of the Philippines</td>
<td>4-5</td>
<td>USD</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Poland</td>
<td>Debt/Equity</td>
<td>National Bank of Poland</td>
<td>2-3</td>
<td>EUR</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Romania</td>
<td>Debt/Equity</td>
<td>Eurostat</td>
<td>2-3</td>
<td>EUR</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>South Africa</td>
<td>Debt/Equity</td>
<td>Johannesburg Stock Exchange</td>
<td>2-3</td>
<td>ZAF</td>
<td>Y</td>
<td>0.64</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Debt/Equity</td>
<td>Colombo Stock Exchange</td>
<td>2-3</td>
<td>USD</td>
<td>Y</td>
<td>0.30</td>
</tr>
<tr>
<td>Thailand</td>
<td>Debt/Equity</td>
<td>Bank of Thailand</td>
<td>3-4</td>
<td>USD</td>
<td>Y</td>
<td>0.92</td>
</tr>
<tr>
<td>Turkey</td>
<td>Debt/Equity</td>
<td>Central Bank of Turkey</td>
<td>2-3</td>
<td>USD</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Debt/Equity</td>
<td>National Bank of Ukraine</td>
<td>2-3</td>
<td>USD</td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

Sources: Authorities’ data, BOPS, and IMF.

* The Czech Republic and Korea are not part of the IMF’s classification of emerging market economies, but are included in private sector classifications of EMs such as leading investment benchmark indices.

** India’s portfolio flow data are recorded on a reporting day basis rather than on a trading day basis, which may contribute to a lower correlation between data used in the KP dataset and Balance of Payments data.
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## Release Lag of High-Frequency Portfolio Flow Proxies Compared in the Nowcasting Horse-Race

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Lag Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly EPFR Data</td>
<td>Available with a lag of about 7 days.</td>
</tr>
<tr>
<td>Monthly EPFR Data</td>
<td>Available with a lag of about 15 days.</td>
</tr>
<tr>
<td>Daily IIF Data</td>
<td>Available with a lag of 1-3 days.</td>
</tr>
<tr>
<td>Monthly IIF Data</td>
<td>Available with a lag of about 1-5 days.</td>
</tr>
<tr>
<td>KP Data</td>
<td>Available with a lag of about 45 days.</td>
</tr>
</tbody>
</table>
Nowcasting Horse-Race Model Specification

\[ \text{BoP}_{\text{quart}} = c + \beta_{ij} \cdot \text{capflow}_{\text{sum}ij} \]

Where \( \text{BoP}_{\text{quart}} \) is quarterly portfolio flow data from the balance of payments, \( c \) is a constant term, and \( \text{capflow}_{\text{sum}ij} \) is the sum of the high-frequency proxies for portfolio flows from the first observation to the \( i \)-th observation of the quarter, and \( j \) represents the portfolio flow proxy used.

For example, to predict the quarterly BoP flows in 2012:Q1, the model is estimated using the observations for 2010:Q1-2011:Q4, while for the prediction for 2012:Q2, the model is estimated using the observations for 2010:Q1-2012:Q1.

We evaluate the predictive content of each portfolio flow proxy by computing the root-mean squared forecast error for each \( i \), for the period from 2012:Q1 until 2019:Q2:

\[ \text{RMSFE}_{ij} = \sqrt{\frac{1}{T} \sum (y_{tij} - \hat{y}_{tij})^2} \]

For equity flows, the sample contains Brazil, India, Pakistan, Philippines, South Africa, Korea, Sri Lanka, Thailand, and Turkey. For debt flows, the sample contains Hungary, India, Poland, South Africa, Thailand and Turkey.
High-Frequency Proxies Outperform an Autoregressive Model by Around 80-90 Percent

Equity and Debt, RMSFE in % of GDP
After 1.5 months in a quarter (2010-19) 1/

Source: IMF staff estimates.
1/ Using all countries for which equity and debt flows are available from all data sources.
BoP-Consistent High-Frequency Proxies more Accurately Nowcast Quarterly BoP Data

Sources: BOPS, EPFR, IIF, IMF.

1 Using all countries for which equity and debt flows are available from all data sources. For equity flows the sample contains Brazil, India, Pakistan, Philippines, South Africa, Korea, Sri Lanka, Thailand, and Turkey. For debt flows the sample contains Hungary, India, Poland, South Africa, Thailand and Turkey.
Country Level Flow Data Confirms This Conjecture

Sources: BOPS, EPFR, IIF, IMF.
1/ Sample period starting in 2005.
Conclusion and Implications

1. Researchers and policy makers should bear in mind the principles underpinning capital flow datasets.

2. Capital flow monitoring and empirical research on high-frequency flows should make greater use of BoP-consistent data.

3. High-frequency data of capital flow components other than portfolio flows could enrich the literature on the drivers of capital flows.
THANK YOU

The Excel files with our charts and data are posted on the IMF website. Search “guide to capital flows” on Google or go to:

Additional Slides
# What Drives Capital Flows to Emerging Markets?

## Figure 1: Drivers of EM Capital Flows by Major Component

<table>
<thead>
<tr>
<th>Type</th>
<th>Driver</th>
<th>Portfolio Equity</th>
<th>Portfolio Debt</th>
<th>Banking Flows</th>
<th>FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Push</strong></td>
<td>Global risk aversion</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Mature economy interest rates</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Mature economy output growth</td>
<td>+</td>
<td>+</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td><strong>Pull</strong></td>
<td>Domestic output growth</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Asset return indicators</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>Country risk indicators</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

- **Strong evidence for positive relationship**
- **Some evidence for positive relationship**
- **Mixed evidence, no clear relationship**
- **Some evidence for negative relationship**
- **Strong evidence for negative relationship**