

Changing Players in Financial Markets and International Shock Transmission

Anusha Chari
UNC-Chapel Hill & NBER & CEPR

AMEC Symposium on The Global Economy after COVID
Federal Reserve Bank of New York
April 14, 2023

Overview: Global Risk & Non-Bank Financial Intermediation

- Unprecedented increase in NBFI flows to emerging markets.
 - ▶ Nearly half external financing to EMs.
 - ▶ Exceeding cross-border lending by global banks.
- Flows enhance risk-sharing across borders & provide access to more diverse forms of financing.
- Inherently more vulnerable to liquidity & redemption risks → periods of global financial market stress → implications for volatility & tail risk.
- Benchmark-driven investments particularly sensitive to global risk shocks such as tightening US dollar funding conditions
- The procyclicality of investment fund flows to during times of global stress poses financial stability concerns with implications for the role of macroprudential policy.

NBFIs as a conduit of tail risk

- NBFIs assets under management rose from \$69B to \$1.15T over the last 15 years (EPFR).
 - Bond funds rose from \$11 billion to \$383 billion.
 - Equity funds rose from \$58 billion to \$759 billion.
- Redemption risk is a known source of instability for professionally managed portfolios (Goldstein, Jian, and Ng, 2017; Falato, Goldstein, and Hortacsu, 2021)
 - ▶ Rapid redemption requests \implies **liquid liabilities**
 - ▶ Underlying investments \implies **illiquid assets**
 - ▶ No liquidity backstop. Managers generally liquidate or increase their investment positions to meet investor redemptions/ subscriptions.
- Shock transmission mechanism: in response to funding shocks from their investor base, global funds substantially alter their portfolio allocations (Jotikasthira et al. 2012).
- IMF (October 2022) warns that liquidity mismatches on NBFIs balance sheets \rightarrow "major vulnerability" \rightarrow risk to global financial stability.

Open-end Fund flows are associated with substantial price changes

$$R_{i,t} = \alpha_i + \beta \frac{K_{i,t}}{M_{i,t-1}} + \gamma_1 PUSH_t + \gamma_2 PULL_{i,t} + \delta_t + \epsilon_{i,t} \quad (1)$$

	(1)	(2)	(3)	(4)	(5)	(6)
	FX Return	MSCI LC	MSCI USD	FX Return	EMBI	LC Bonds
% Δ equity mkt.	10.07*** (2.113)	-31.03*** (4.622)	-38.36*** (6.014)			
% Δ bond mkt.				3.787* (1.986)	-8.006*** (1.773)	-6.759*** (1.352)
Observations	17511	17515	17515	15822	13550	10230

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A 1SD equity liquidation 0.023% of MC (\$71.8M) is associated with 23 BP currency depreciation and a 71-88 BP drop in aggregate equity returns. [Chari, Dilts-Stedman & Lundblad \(2023\)](#)

For Brazil, these numbers roughly translate to the following magnitudes:

A one standard weekly deviation equity liquidation is 0.03% of Mkt. Cap (\$288M):

Currency depreciation: 30 bp

Local currency return decline: 93 bp

USD return decline: 115 bp

The largest equity fund weekly outflows were 0.26% of market cap (\$2.3B):

Currency depreciation: 261 bp

Local currency return decline: 807 bp

USD return decline: 997 bp

These price changes are particularly large when risk aversion is elevated

	(1)	(2)	(3)	(4)	(5)	(6)
	FX Return	MSCI LC	MSCI USD	FX Return	EMBI	LC Bonds
% Δ equity mkt.	6.984*** (1.903)	-15.76*** (2.626)	-20.08*** (3.885)			
1[RA > Q75]	0.353*** (0.0957)	-1.666*** (0.171)	-2.167*** (0.217)	0.399*** (0.104)	-0.506*** (0.114)	-0.130* (0.0727)
1[Risk > Q75]	0.148*** (0.0287)	-0.562*** (0.0596)	-0.692*** (0.0692)	0.185*** (0.0329)	0.0177 (0.0809)	0.00606 (0.0637)
1[RA > Q75]=1 \times % Δ equity mkt.	3.570* (2.061)	-34.32*** (4.600)	-38.57*** (4.595)			
1[Risk > Q75]=1 \times % Δ equity mkt.	2.686 (1.734)	-0.611 (2.373)	-1.832 (3.234)			
% Δ bond mkt.				1.885* (1.075)	-1.870*** (0.446)	-3.987** (1.665)
1[RA > Q75]=1 \times % Δ bond mkt.				1.467 (1.011)	-11.78*** (3.648)	-4.836* (2.382)
1[Risk > Q75]=1 \times % Δ bond mkt.				1.797 (1.303)	-4.523*** (1.388)	-2.556*** (0.800)
Observations	17511	17515	17515	15822	13550	10230

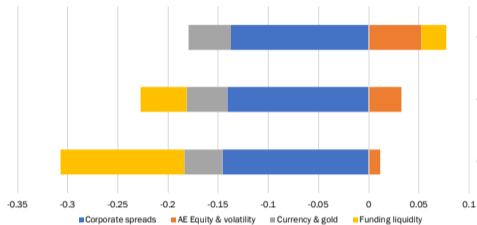
Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

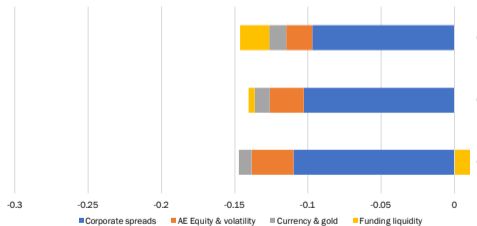
The International Transmission of Shocks

- Risk aversion "exports" push factors (like US monetary policy) Global Risk Shock Configurations
Structural Measures Non-parametric Approaches
- Benchmarking \implies higher conformity in global fund investments \rightarrow herd behavior \rightarrow elevated cross-market correlations? Active/Passive
- Fund flow-performance relationship (Sirri & Tufano (1998)): feedback loops \rightarrow price-liquidity spirals.
- ETFs can also be associated with important pass-through effects as well (eg. Ben-David et al. (2018), Da & Shive (2018)).
- The underlying heterogeneity in the fund management machinery can help us to uncover the variation in these potential amplification effects.

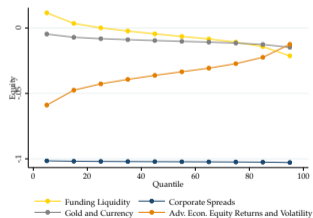
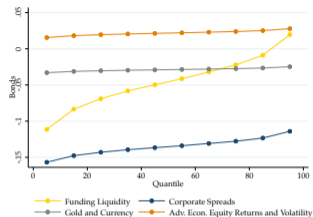
The Provenance of Risk Shocks



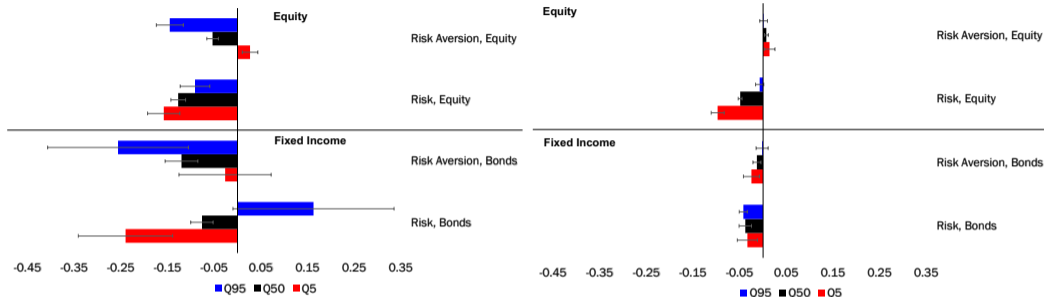
(a) Bonds



(b) Equity



Fund-level Heterogeneity: Passive vs. Active Funds



(a) Passive funds

(b) Active funds

Passive funds react up to an order of magnitude more to sentiment shocks

- **RA:** $|\hat{\beta}^{(95)}| > |\hat{\beta}^{(5)}| \implies$ tails-in (sudden stop)
- **Risk:** $|\hat{\beta}^{(95)}| < |\hat{\beta}^{(5)}| \implies$ tails-out (flight)

Active equity funds are hardly affected by risk aversion shocks

→ The actual conduits that facilitate investors flows matter ←

Macroprudential Regulation & Vulnerability to the Global Financial Cycle

(Chari, Dilts-Stedman & Forbes (2022))

- Portfolio flow impacts:
 - Small during “normal” times (in the global risk shock distribution)
 - Large and significant at the “extremes”, especially risk-off periods

Important interactions of macroprudential regulations with the global financial cycle

- Magnify the impact of risk shocks on bond flows
- Type of macroprudential tool matters (LTV, AFX vs. CCYB)

Supports concerns that macropru shifts some financial intermediation in ways that can increase vulnerability to the global financial cycle & global risk shocks.

- More attention to regulatory perimeter?

Some Concluding Thoughts

- Why should the US care? Spillbacks. Foreign sales/valuations. Debt distress. Creditor-coordination (Dispersed bondholders)
- A need for a macro-prudential approach to investment fund regulation?
- Reforms to mitigate the redemption risks, procyclicality, and the herding associated with investment fund flows:
 - * Liquidity management tools: countercyclical liquidity buffers analogous to bank capital buffers (CCyb)?
 - * Liquidity stress testing to gauge portfolio liquidity?
- Policies to strengthen the resilience of emerging financial markets to global shocks will ultimately need to address the underlying currency and liquidity mismatches associated with non-bank intermediated financial flows (Chari, 2023).

Thank You!

References

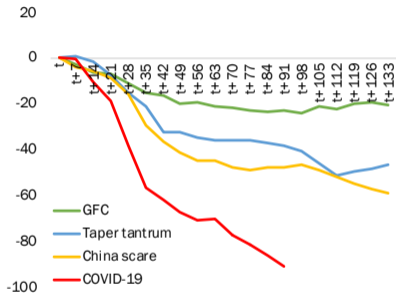
- Bekaert, G., Engstrom, E. C., and Xu, N. R. (2022). The time variation in risk appetite and uncertainty. *Management Science*, 68(6), 3975-4004.
- Ben-David, I., Franzoni, F., and Moussawi, R. (2018). Do ETFs increase volatility? *The Journal of Finance*, 73(6), 2471-2535.
- Chari, Anusha (2023). Global Risk, Non-Bank Financial Intermediation, and Emerging Market Vulnerabilities. *Annu. Rev. Econ.* 15: Submitted. DOI: <https://doi.org/10.1146/annurev-economics-082222-074901> NBER Working Paper 31143 <http://www.nber.org/papers/w31143>
- Chari, Anusha, Karlye Dilts Stedman and Christian Lundblad (2023). Global Fund Flows and Emerging Market Tail Risk. NBER Working Paper.
- Chari, Anusha Karlye Dilts-Stedman, Kristin Forbes (2022). Spillovers at the extremes: The macroprudential stance and vulnerability to the global financial cycle. *Journal of International Economics*, 136, 103582.
- Chari, Anusha, Karlye Dilts Stedman and Christian Lundblad (2020). Capital Flows in Risky Times: Risk-On, Risk-Off and Emerging Market Tail Risk, NBER Working Paper No. 27927, National Bureau of Economic Research.
- Chari, Anusha, Karlye Dilts Stedman and Christian Lundblad (2021). Taper Tantrums: Quantitative Easing, its Aftermath and Emerging Market Capital Flows. *Review of Financial Studies*, 34, 1445-1508.
- Da, Z., and Shive, S. (2018). Exchange traded funds and asset return correlations. *European Financial Management*, 24(1), 136-168.
- Falato, A., Goldstein, I., and Hortacsu, A. (2021). Financial fragility in the Covid-19 crisis: The case of investment funds in corporate bond markets. *Journal of Monetary Economics*, 123, 35-52.

References contd.

- Goldstein, I., Jiang, H., and Ng, D. T. (2017). Investor flows and fragility in corporate bond funds. *Journal of Financial Economics*, 126(3), 592-613.
- IMF. (2022). Global financial stability report (Vol. October 2022. Technical Report).
- Jotikasthira, C., Lundblad, C., and Ramadorai, T. (2012). Asset fire sales and purchases and the international transmission of funding shocks. *The Journal of Finance*, 67(6), 2015-2050.
- Sirri, E. R., and Tufano, P. (1998). Costly search and mutual fund flows. *The Journal of Finance*, 53(5), 1589-1622.

Stress Episodes & Emerging Market Capital Flows

There are several good examples of large moves that might have distributional implications.

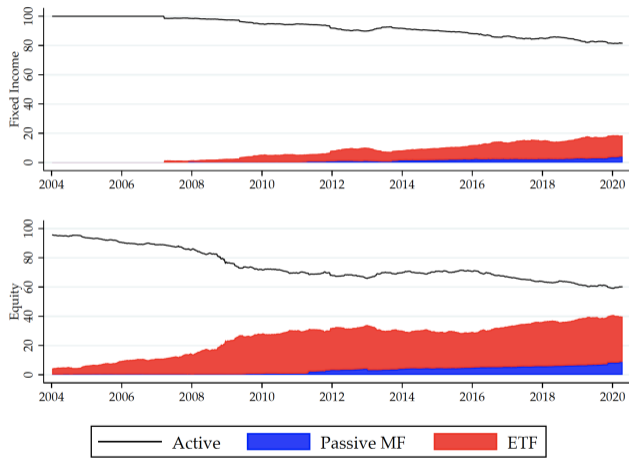


(a) EFPR Bond Flows, Billions USD



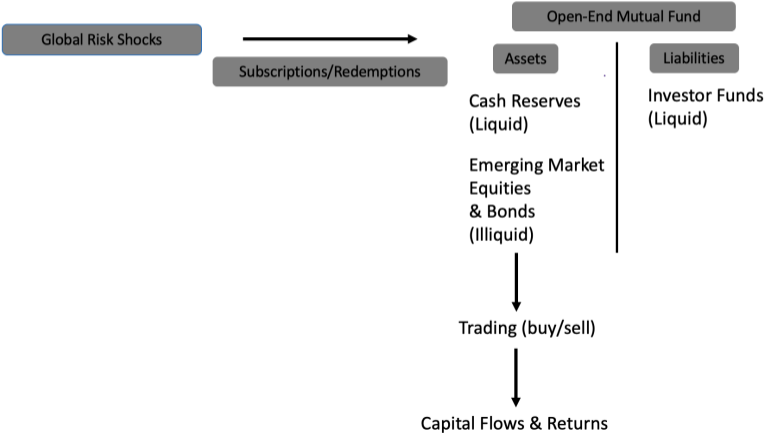
(b) MSCI USD Returns

The composition of fund flows as a proportion of assets under management



Shock Transmission via Global Portfolio Allocations

Schematic Representation of Open-End Mutual Fund Trading



A Topology of Global Risk Shock Configurations

- Candidate shocks fall into three interrelated categories:
 - i US/advanced economy monetary policy shocks. [US MP Shocks](#)
 - ii global liquidity and funding condition shocks.
 - iii exchange rate shocks
- Shocks can impact foreign investor risk aversion, the risk-bearing capacity of international financial intermediaries & international capital market liquidity.
- Global risk measurement evolved from unitary sources to composite measures encapsulating the variable sources of global risk → draw upon multiple financial asset prices to summarize risk-on, risk-off states of the world.

Taper Tantrums: QE, its Aftermath & Emerging Market Capital Flows

Chari, Dilts-Stedman & Lundblad (2021). Reveal heterogeneity along three principal lines:

① Flows versus prices:

- ▶ In nearly every specification, the effect of MP shocks on asset values is larger than that for physical flows. Valuation changes play a central role in overall position changes between sub-periods.

② Debt versus equity:

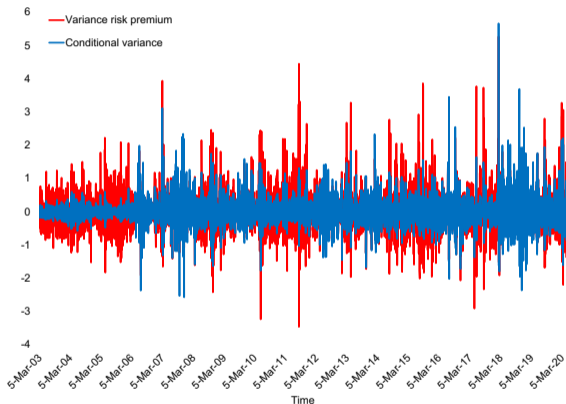
- ▶ Equity positions and valuations are more sensitive to MP shocks than that for debt over the QE and unwinding periods.

③ Quantitative easing versus tapering:

- ▶ Striking order-of-magnitude difference between the QE & the taper period.
- ▶ During the QE period, the effects on flows and valuations not consistent over all dependent variables.
- ▶ In contrast, the tapering period shows a consistent and large effect of MP shocks on nearly all variables of interest.

Measuring Global Shocks:

Commonly employed measures in the international finance literature (e.g., VIX) combine information about the quantity and price of risk.



Structural decomposition from Bekaert et al (2022) separates the price (risk aversion) from the quantity (physical value) of risk [Back](#)

An Alternative Nonparametric Measure of Global Risk

RORO index from components that fall into four categories using PCA:

- **Corporate Spreads (credit risk)**
 - ▶ US, Euro area corporate spread
- **Advanced economy equities (volatility/physical risk)**
 - ▶ Inverse total return changes: S&P 500, STOXX 50, MSCI Adv. economies
 - ▶ Option implied volatility: VIX, VSTOXX
- **Liquidity (funding conditions)**
 - ▶ G-spread (avg. 2-, 5-, 10-year)
 - ▶ TED Spread, 3-month LIBOR-OIS spread, 3-month Treasury bid-ask spread
- **Currencies and Gold**
 - ▶ Trade weighted U.S. Dollar Index against adv. foreign economies
 - ▶ Gold price

Chari, Dilts-Stedman & Lundblad (2020) [Back](#)

Shock Transmission via Global Fund Reallocation

- As global investor risk appetite or global risk increases or decreases large, foreign institutional investors rebalance their portfolios away from risky assets, towards safe assets.
- The structure of open-end mutual funds suggest important implications for asset price determination & global asset allocation, particularly for risky emerging market assets.
- Extreme capital flow & returns realizations are tied to global risk and risk appetite and the fund management machinery that increasingly facilitates cross-border investment.

The limited discretion afforded to the passive fund manager, linked to benchmarking, creates a pass-through effect that engenders abnormal co-movements in emerging market flows and returns. [Back](#)