On the International Transmission of Shocks: Micro-Evidence from Mutual Fund Portfolios

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9th Research Meeting of the NIPFP-DEA Program
New Delhi
March 15 and 16, 2012

I. Motivation

- Crisis literature stresses role of financial intermediaries
  - Risk taking behavior that generate crises
  - Propagation of shocks across markets and countries
- Interest on "supply side" of funds in int'l and finance lit.
- Theories on how financial intermediaries propagate shocks: focusing on incentives, information, organizations
- Empirics: aggregate investments x-countries, by foreign & domestic agents, and certain intermediaries (mostly banks)
- Relatively limited evidence on inner-workings of financial intermediaries, especially at international level
- Empirical micro aspects essential to understand how financial intermediaries work and what drives their behavior

I. Motivation: This Paper

- Study specific shocks that intermediaries face, how agents react to them, and what effects they have across countries
  - Particular attention to global crisis, but also other crises and non-crises
- Behavior of international mutual fund portfolios
- Disentangle and quantify contribution of
  - Underlying investors by measuring injections/redemptions
  - Managers through changes in country weights and cash
- Micro-level dataset on mutual funds
  - More than 1,000 equity and bond funds
  - Global, global emerging, and several regional mutual funds
  - Portfolio weights and assets invested in each country around the world
  - Cash positions
  - Injections and redemptions into each fund
  - Monthly basis starting in 1996

I. Motivation: This Paper

- How volatile is the mutual fund investment across countries?
- Do mutual funds help transmit crises? If so, how?
- What are the different shocks that mutual funds face?
- What is the role of investors and managers?
  - How volatile are injections?
  - Do weights remain constant over time?
  - How much due to return shocks vs. actual buying/selling?
  - How are cash positions used?
  - What was behavior of investors/managers during global crisis?
- How much of the volatility of capital flows driven by managers?
- Are there differences between bond and equity funds?

I. Motivation: This Paper

- Contributions to at least four strands of theoretical discussions
- Does demandability of assets play a role in investor reactions?
- Do open- and closed-end structures of mutual funds matter?
  - Do open-end funds act counter-cyclically?
- How are shocks transmitted across countries?
- How are portfolios managed when investing around the world?
  - How do shocks impact them?

I. Motivation: Related Literature

- Contribution to empirical literature
  - Micro evidence on inner-workings of financial intermediaries and transmission of shocks
- Origins and propagation of financial crises
  - Aggregate evidence on the transmission of shocks
  - Little focus on financial institutions
  - This papers contributes by studying in detail international mutual funds
- Behavior and interaction of investors and managers around crises
  - Investors (injecting/withdrawing capital from open-ended funds)
  - Managers (actively allocating country portfolios and reacting to shocks))
  - Recent and related relevant paper Jotikasthira et al. (2010)
  - Earlier cases: Borensztein and Gelos (2003), Kaminsky et al. (2004), Hau and Rey (2008)

Presentation

I. Motivation

II. Data and Summary Statistics

III. Shocks to Managers and Portfolio Reallocations

IV. Behavior of Investors and Managers

V. Gross and Net Country Flows

VI. Conclusions

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II. Data: Micro-level Dataset on Mutual Funds

- Data coverage (monthly frequency)
  - 1,076 funds
  - 965 equity funds: Jan 1996-Nov 2010
  - 111 bond funds: Jul 2002-Nov 2010
- 7,429,000 obs./weights across funds, 124 countries, and over time
  - Equity funds: 6,867,500 obs.
  - Bond funds: 561,500 obs.
- Variables
  - Total net assets (TNA)
  - % of the funds' assets allocated to each country and held in cash
  - Investor type: active/passive
  - Investment scopes (geographical regions)
  - Others: fund domicile, family, main currency denomination

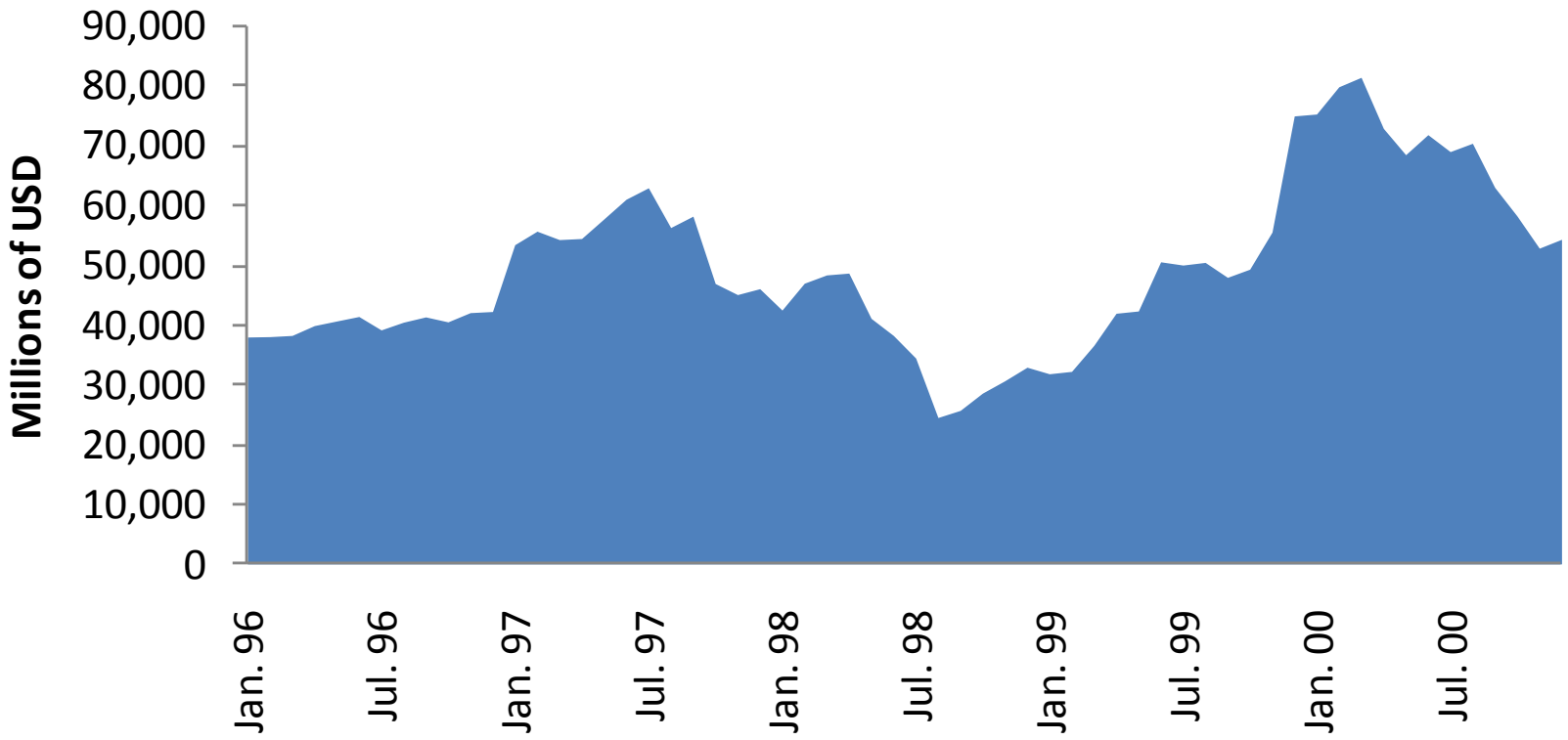
II. Additional Data

- Fund prices (NAV)
  - 255,510 obs., monthly basis
  - 90% of matches with EPFR funds: 896 equity funds, 106 bond funds
  - Sources: Bloomberg and Datastream
  - Used to compute returns and injections to funds
- Country stock and bond market indexes (U.S. dollars)
  - 23,272 obs., monthly basis
  - Equity markets: 86 countries, Jan 1999-Nov 2010
  - Bond markets: 78 countries, Jul 2002-Nov 2010
  - Sources: MSCI std. index, S&P BM index, local sources , JP Morgan sovereign bond index
  - Used to compute returns at country level and flows to countries

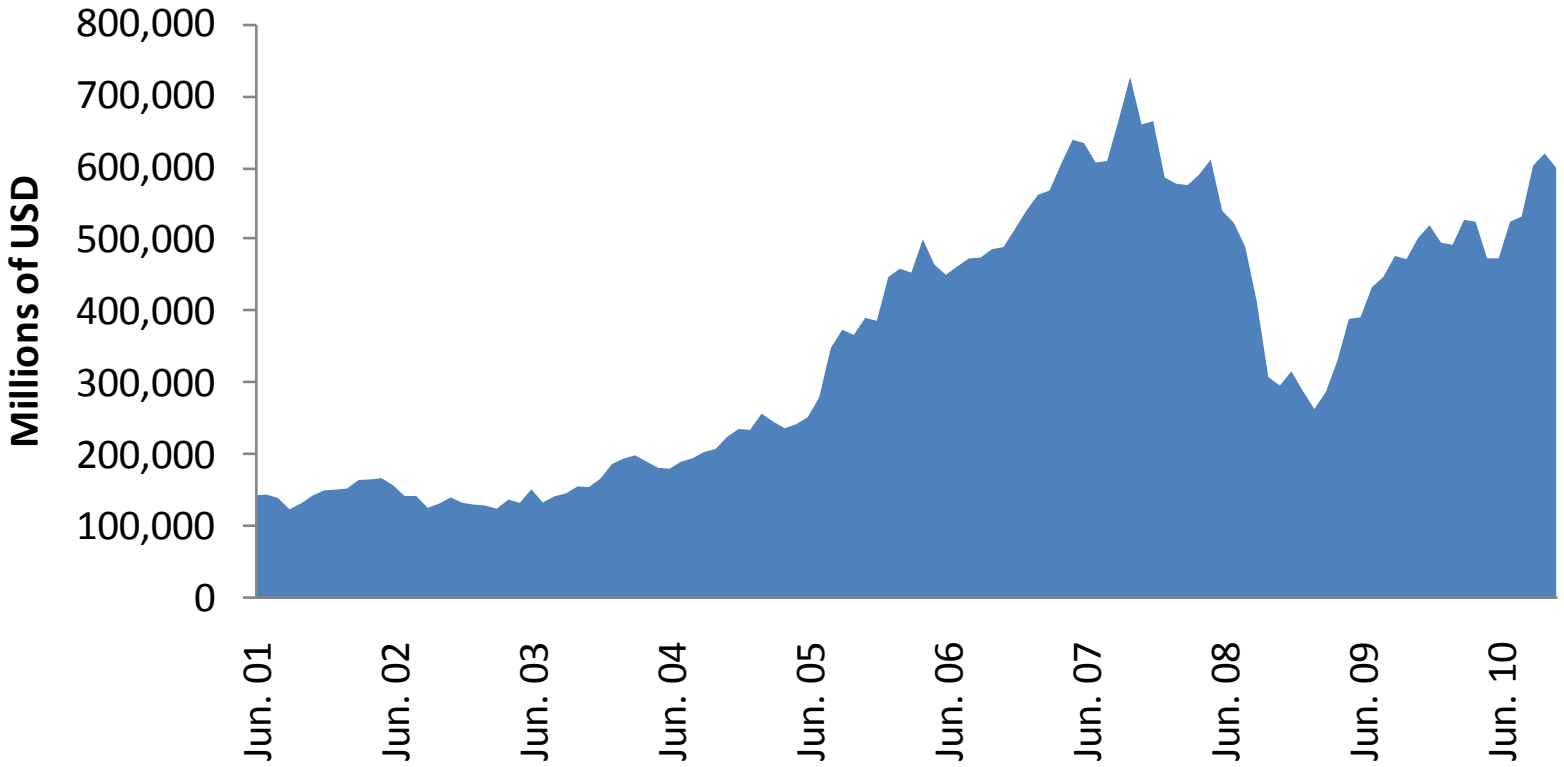
II. More on Sample Characteristics

- Equity Funds
  - Median number of observations per fund: 47
  - 9 types of funds:
  - global, global emerging markets
  - Asia ex-Japan, BRIC, emerging Europe, Middle East and Africa, emerging Europe, Europe, Latin America, Pacific
- Bond Funds
  - Median number of observations per fund: 34
  - 2 types of funds: global and global emerging markets
- Different Partitions
  - 95% of funds actively managed
  - 65% of funds with investment scope in Asia ex-Japan, global, global emerging, and Europe.
  - Funds primarily domiciled in developed market jurisdictions (80% domiciled in Luxemburg the U.S., the U.K., and Ireland)

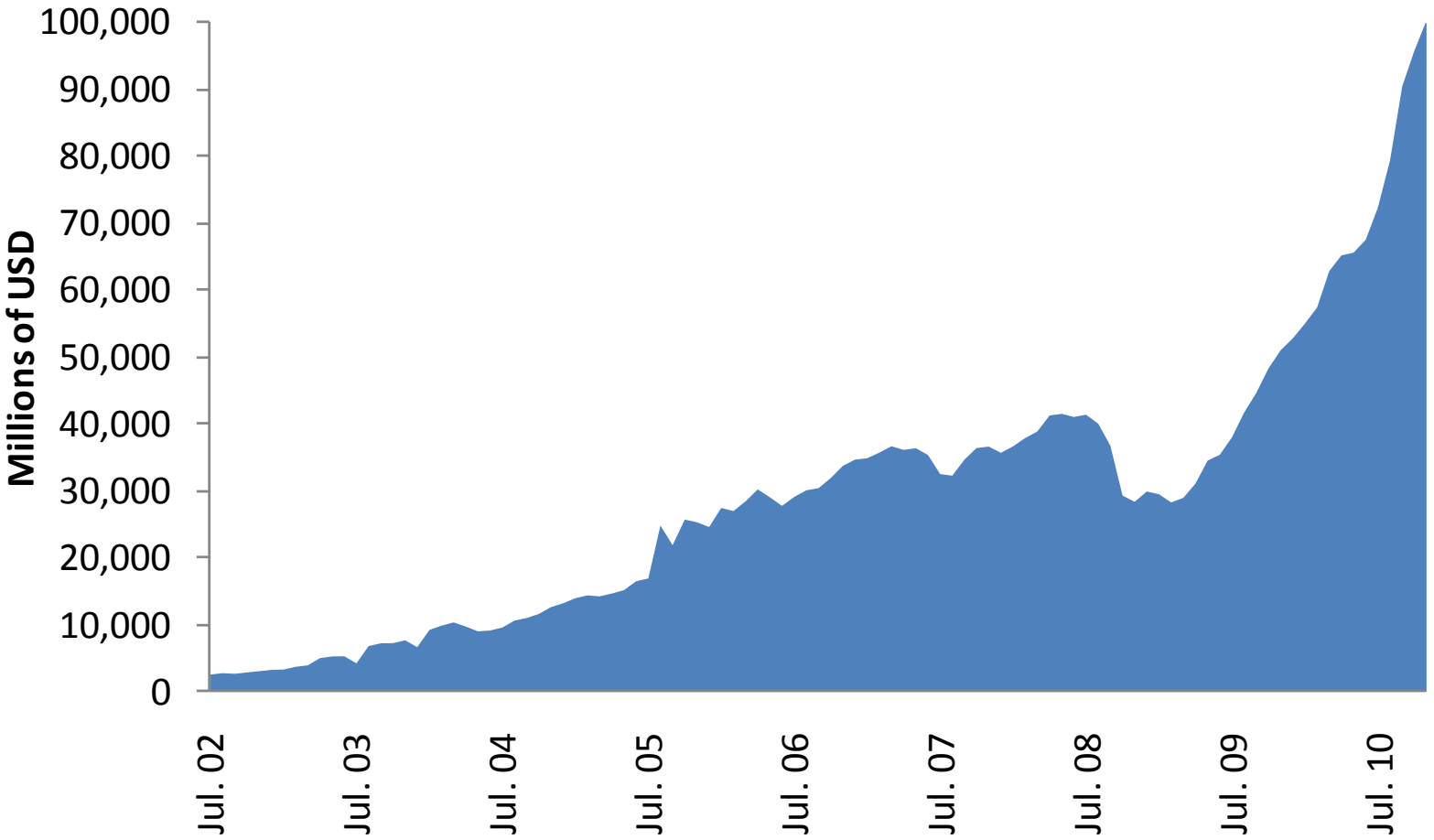
II. Evolution of Total Assets in Equity Funds (1996-2000)



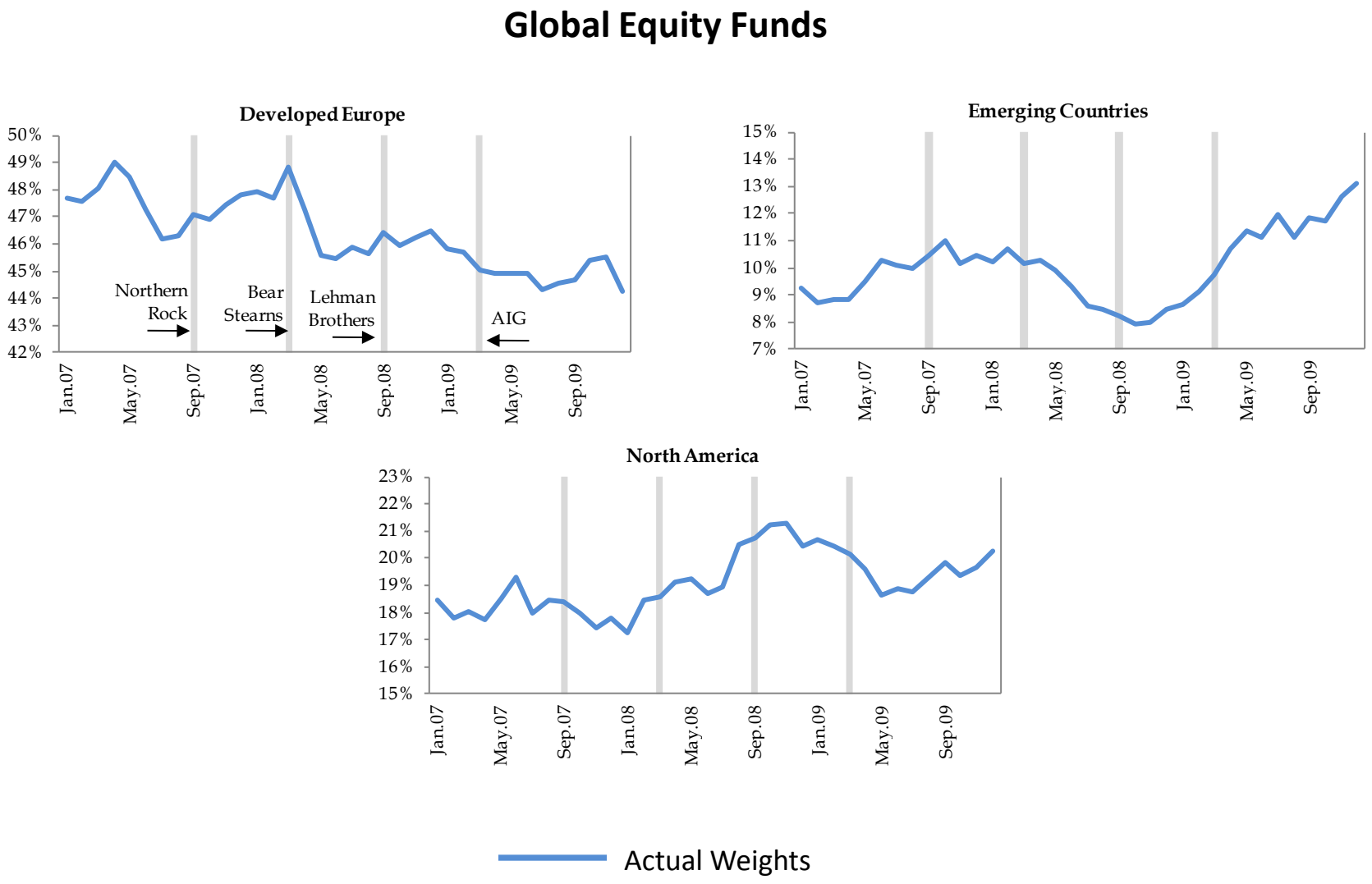
II. Evolution of Total Assets in Equity Funds (2001-2010)



II. Evolution of Total Assets in Bond Funds



II. Behavior of Managers: Event Studies



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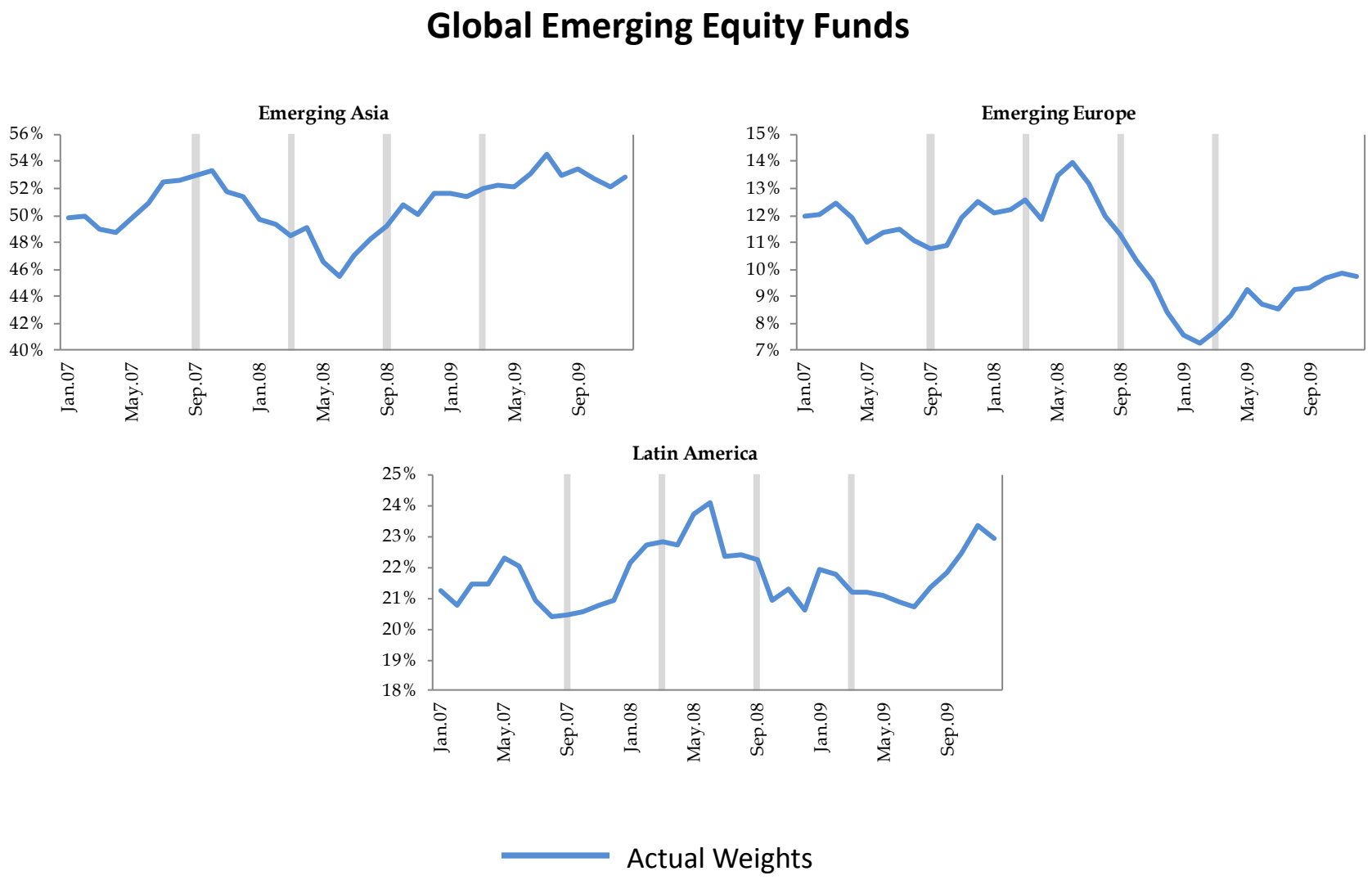

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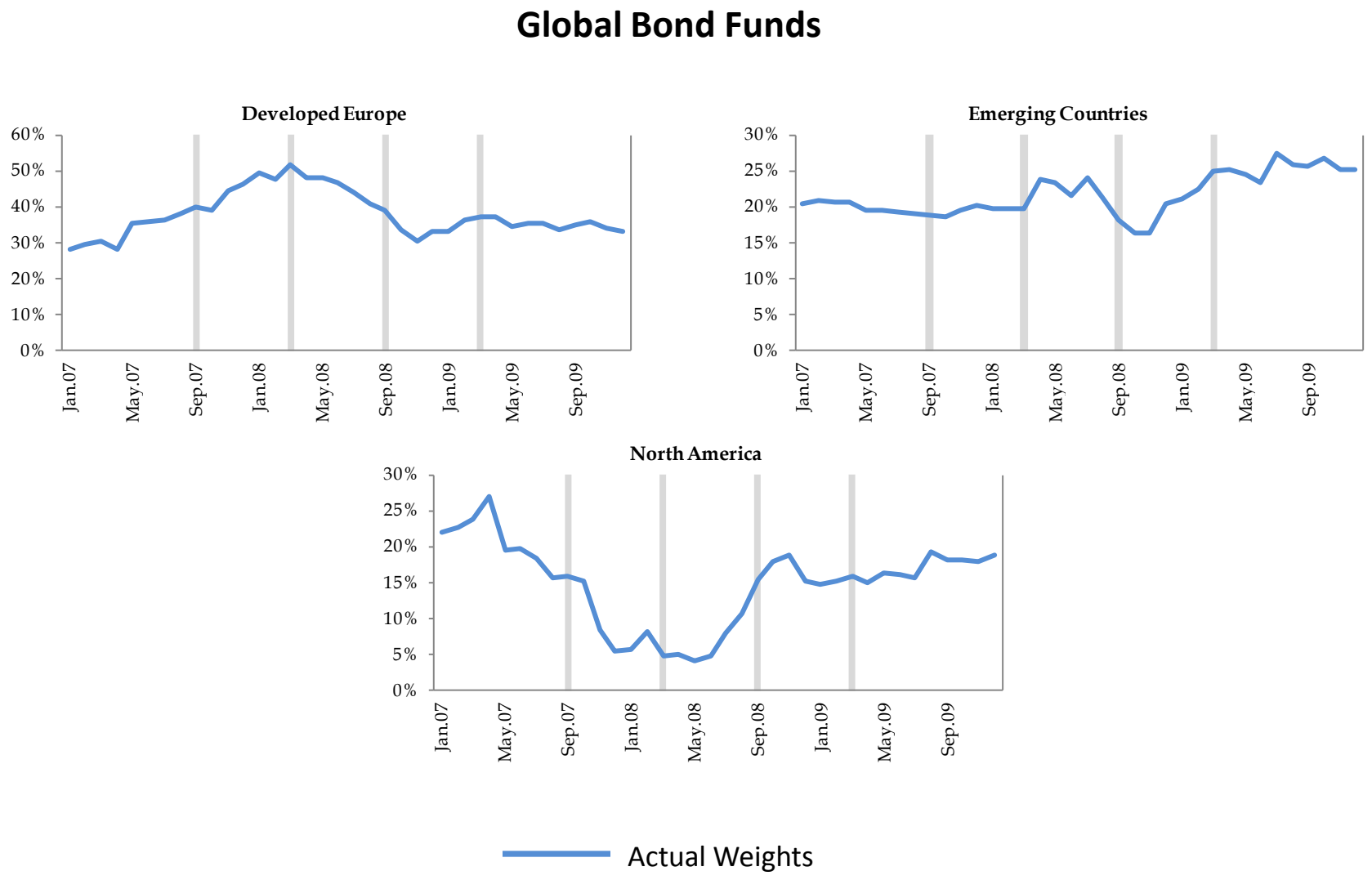

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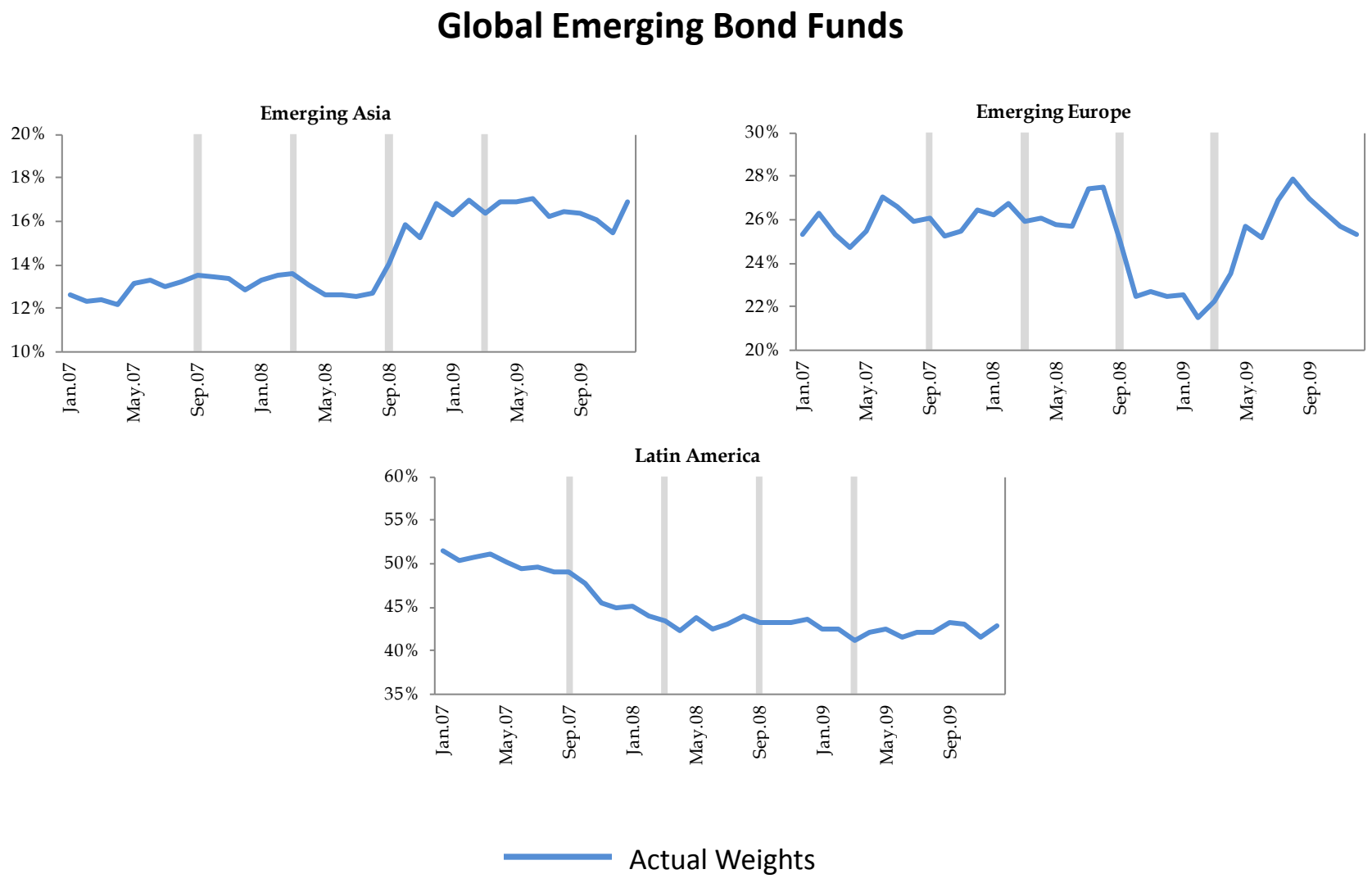
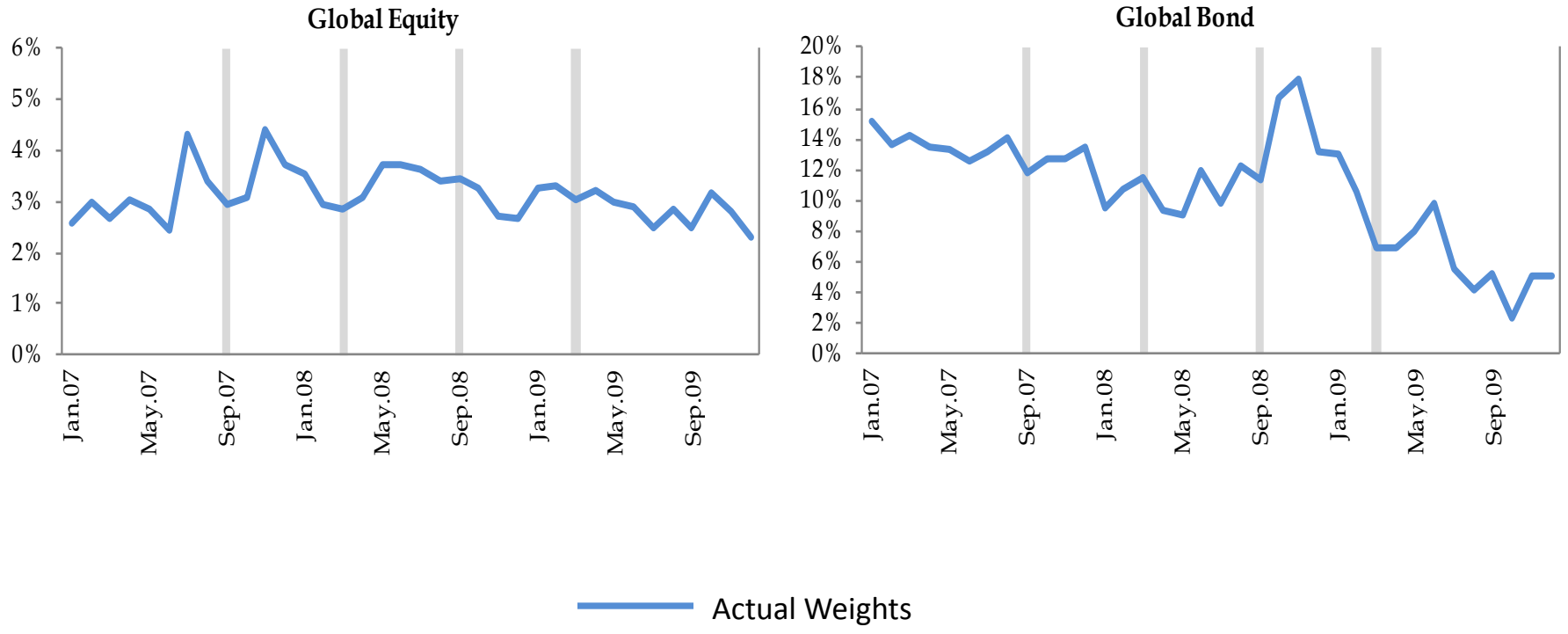


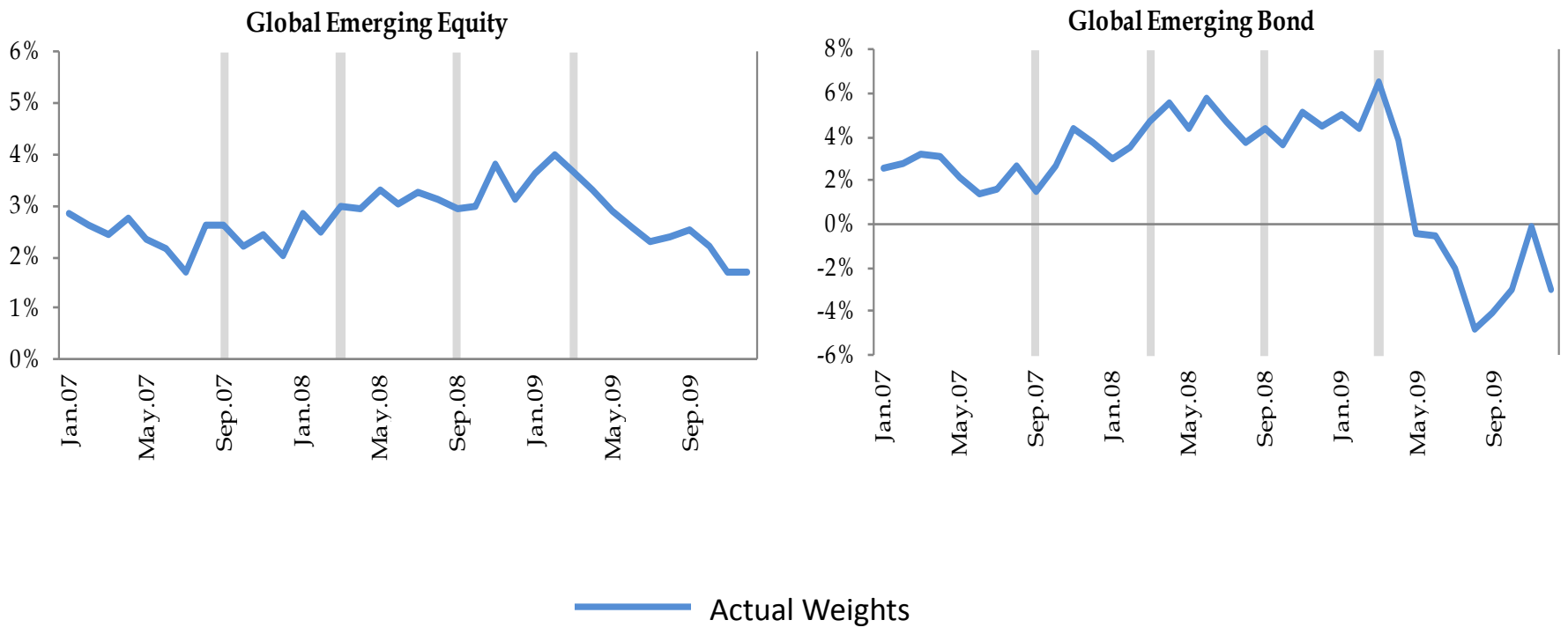
II. Behavior of Managers: Event Studies

Cash Weights – Global Funds



II. Behavior of Managers: Event Studies

Cash Weights – Global Emerging Funds



II. Weights in Mutual Funds by Geographical Regions

- Funds invest mainly in the region/market segment they target
  - "Asia ex-Japan" equity funds invest 96% of their portfolio in developed and emerging Asia
  - "Latin America" equity funds invest 97% of their portfolio in Latin America
- Funds specialized in multi-region market segments invest across regions consistent with each region's market size
- Bond funds and comparable equity funds allocate their portfolio across regions in roughly the same manner

Presentation

I. Motivation

II. Data and Summary Statistics

III. Shocks to Managers and Portfolio Reallocations

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III. Variation in Funds' Assets

- Growth rate of total assets in a fund equals net returns plus injections to the fund, as a fraction of initial assets

$$\hat{A}_{it} = r_{it} + f_{it}$$

- Median of $\hat{A}_{it}$ across funds for each month and its evolution
  - Only continuing funds in each period

- Injections to mutual funds:

$$F_{it} = A_{it} - A_{it-1} \cdot R_{it}$$

$$R_{it} = P_{it} / P_{it-1}$$

III. Variation in Assets: Decomposition of Asset Growth

Equity Funds

	Mean			Standard Deviation	Variance Descomposition	
	Growth Rate of Assets	Returns	Injections/ Initial Assets	Growth Rate of Assets	Returns	Injections/ Initial Assets
All Equity Funds	2.20%	1.01%	1.15%	10.34%	47.24%	52.76%
Global	1.59%	0.71%	0.88%	6.96%	54.69%	45.31%
Global Emerging	2.85%	1.32%	1.46%	9.67%	49.57%	50.43%

Bond Funds

	Mean			Standard Deviation	Variance Descomposition	
	Growth Rate of Assets	Returns	Injections/ Initial Assets	Growth Rate of Assets	Returns	Injections/ Initial Assets
All Bond Funds	3.94%	0.69%	3.19%	8.66%	11.37%	88.63%
Global	0.61%	0.31%	0.60%	7.39%	9.31%	90.69%
Global Emerging	1.31%	0.43%	0.92%	10.54%	9.74%	90.26%

III. Variance Decomposition (Tranquil vs. Crisis Times)

Equity Funds

Period	Before Global Financial Crisis (Jan. 2003-Feb. 2007)		Global Financial Crisis Narrow Window (Mar. 2008-Dec. 2009)		Global Financial Crisis Wide Window (Mar. 2007-Oct. 2010)	
	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets
All Equity Funds	36.74%	63.26%	67.01%	32.99%	57.65%	42.35%
Global	37.06%	62.94%	65.40%	34.60%	60.44%	39.56%
Global Emerging	33.54%	66.46%	70.15%	29.85%	64.71%	35.29%

Bond Funds

Period	Before Global Financial Crisis (Jan. 2003-Feb. 2007)		Global Financial Crisis Narrow Window (Mar. 2008-Dec. 2009)		Global Financial Crisis Wide Window (Mar. 2007-Oct. 2010)	
	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets
All Bond Funds	12.36%	87.64%	18.78%	81.22%	11.82%	88.18%
Global	5.18%	94.82%	2.66%	97.34%	4.45%	95.55%
Global Emerging	12.90%	87.10%	26.23%	73.77%	20.59%	79.41%

III. Variation in Assets

- Returns and injections contribute to the variability of asset growth
  - They vary over time consistently with the international business cycle
  - But they are not purely driven by a common time component (especially injections)
    - A common time component explains 59% and 20% of the variability of returns for equity and bond funds, respectively
    - Same component only explains 5% and 9% of the variability of injections for equity and bond funds, respectively

III. Variation in Country Weights

- Funds receive significant fluctuations in returns and injections that change their total net assets
- Do managers allow country weights to vary over time, perhaps as result of those shocks?
- Variation of country portfolio weights
  - Stable weights imply that only fluctuations in funds' assets (either because of returns or injections) impact capital flows
  - Non-trivial fluctuations imply that managers decision may play a role in international capital markets

III. Variation in Country Weights: Coefficients of Variation

Equity Funds

	Number of Funds		Within Target Region	Target Region	Non-Target Region	Cash
Global	155	Across Funds	1.57	0.07	0.66	1.15
		Within Funds	0.61	0.05	0.41	0.72
Global Emerging	187	Across Funds	0.66	0.04	1.56	0.85
		Within Funds	0.53	0.03	0.68	0.93

Bond Funds

Global	30	Across Funds	2.09	0.19	0.56	1.22
		Within Funds	0.66	0.08	0.22	0.46
Global Emerging	81	Across Funds	1.23	0.14	1.35	1.78
		Within Funds	0.44	0.05	0.35	1.21

III. Variation in Country Weights: Coefficients of Variation

	Number of Funds		Developed Asia and Pacific	Developed Europe	Emerging Asia	Emerging Europe	Latin America	Middle East and Africa	North America	Cash	Across Countries
Equity Funds											
Global	155	Across	0.46	**0.32**	1.08	2.30	1.41	1.32	0.71	1.15	**1.17**
		Within	0.16	**0.10**	0.32	0.66	0.42	0.47	0.11	0.72	**0.56**
Global Emerging	187	Across	1.18	1.61	**0.17**	0.31	0.21	0.28	9.30	0.85	**0.69**
		Within	0.65	1.08	**0.13**	0.23	0.17	0.25	1.33	0.93	**0.53**
Bond Funds											
Global	30	Across	0.91	**0.50**	1.91	1.56	1.73	1.21	0.63	1.22	**1.51**
		Within	0.29	**0.20**	0.38	0.49	0.35	0.96	0.21	0.46	**0.69**
Global Emerging	81	Across	3.42	2.10	0.52	0.24	**0.26**	0.73	4.29	1.78	**1.66**
		Within	0.44	1.84	0.25	0.16	**0.13**	0.32	3.16	1.21	**0.82**

III. Variation in Country Weights: Coefficients of Variation

	Investment Strategy	Number of Funds		Coefficients of Variation							
				Developed Asia and Pacific	Developed Europe	Emerging Asia	Emerging Europe	Latin America	Middle East and Africa	North America	Cash
Equity	Active	917	Across	1.46	1.65	1.1	2.23	1.94	2.92	2.87	1.12
			Within	0.2	0.08	0.14	0.12	0.09	0.19	0.12	0.93
	Passive	48	Across	2.05	1.27	1.51	2.51	1.99	3.02	3.16	2.96
			Within	0.03	0.02	0.02	0.02	0.02	0.04	0.05	0.89
Bond	Active	108	Across	2	1.82	0.77	0.62	0.63	0.99	2	1.58
			Within	0.31	0.23	0.27	0.18	0.14	0.37	0.22	0.91
	Passive	3	Across	-	-	0.2	0.03	0.04	0.06	1.73	1.04
			Within	-	-	0.02	0.01	0.01	0.01	2	0.47

III. Variation in Country Weights

- Substantial variation in country weights
  - Variation across countries and regions, across and within funds
  - What drives these changes?
  - To what extent this variation is explained by prices?

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IV. Behavior of Investors

- Injections by investors may be linked to fund attributes that vary at the fund and time level or to shocks to investors themselves
- LHS: injections (normalized by fund average assets over time)
- RHS:
  - The occurrence of crises (country and global)
  - Returns of the fund
  - Returns of its country of origin
- The effects of these variables are not obvious
  - Investors augmenting the cycle or going against it
  - Decline in conditions at country of origin relative to foreign
    - Wealth vs. substitution effects

IV. Behavior of Investors: Injections to Equity Funds

A. Equity Funds

Variables	Injections/Average Assets						
Country Crisis	-0.048*				-0.003	-0.009	-0.013
	(0.014)				(0.012)	(0.010)	(0.011)
Global Crisis		-0.018*			-0.008†		
		(0.001)			(0.004)		
Lagged Fund Returns			0.161*		0.119*	0.171*	0.178*
			(0.024)		(0.023)	(0.033)	(0.039)
Country of Origin Returns				0.261*	0.222*	0.135*	
				(0.024)	(0.023)	(0.028)	
Time Fixed Effects	No	No	No	No	No	Yes	No
Country of Origin-Time Fixed Effects	No	No	No	No	No	No	Yes
No. of Observations	41,232	41,232	40,492	39,479	38,764	38,764	40,492
R-squared	0.035	0.036	0.047	0.050	0.065	0.114	0.174
Adj.R-sq	0.016	0.017	0.028	0.031	0.046	0.092	0.090

*=1%, †=5%, ~=10%

IV. Behavior of Investors: Injections to Bond Funds

B. Bond Funds

Variables	Injections/Average Assets						
Country Crisis	-0.081*				-0.070*	-0.018	-0.031
	(0.021)				(0.018)	(0.016)	(0.023)
Global Crisis		-0.038*			-0.028*		
		(0.006)			(0.008)		
Lagged Fund Returns			0.229†		0.205†	0.126~	0.107
			(0.111)		(0.102)	(0.070)	(0.067)
Country of Origin Returns				0.464*	0.468*	0.337*	
				(0.148)	(0.127)	(0.121)	
Time Fixed Effects	No	No	No	No	No	Yes	No
Country of Origin-Month Fixed Effects	No	No	No	No	No	No	Yes
No. of Observations	3,520	3,520	3,445	3,261	3,196	3,196	3,445
R-squared	0.061	0.065	0.073	0.068	0.092	0.156	0.266
Adj. R-sq	0.038	0.041	0.051	0.044	0.069	0.107	0.087

*=1%, †=5%, ~=10%

IV. Behavior of Managers: Framework

- Behavior of (log) weights

$$\omega_{ijt} = \alpha \cdot \omega_{ijt-1} + \beta \cdot \left(r_{jt} - r_{it}\right) + \gamma \cdot Crisis_{jt} + \tilde{\delta}_{ij} + \theta_{it} + \upsilon_{ijt}$$

- Test for persistence of weights and response to returns and crises
- Some econometric considerations
  - Dynamic panel: Asymptotic bias from LSDV small due to large T
  - Unit root
    - Im-Pesaran test rejects the hypothesis of unit roots
    - Results in “differences” similar
    - Results at lower frequencies
  - Endogeneity (funds reactions to country returns and crises)
    - Estimated at the individual fund level
    - Fund-time FEs capture shocks that affect all funds at a given time

IV. Behavior of Managers: Country Weights

A. Equity Funds								
	Log Country Weights							
	Monthly						Semi Annual	Annual
Log Lagged Weights	0.986*	0.982*	0.983*	0.899*	0.901*	0.901*	0.568*	0.307*
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.012)	(0.026)
Relative Returns	0.622*	0.647*	0.993*	0.598*	0.959*	0.956*	0.857*	0.567*
	(0.051)	(0.057)	(0.013)	(0.049)	(0.013)	(0.013)	(0.032)	(0.035)
Country Crisis						-0.020*	-0.069*	-0.118*
						(0.003)	(0.017)	(0.026)
Fund Fixed Effects	No	Yes	No	No	No	No	No	No
Date Fixed Effects	No	Yes	No	No	No	No	No	No
Fund-Date Fixed Effects	No	No	Yes	No	Yes	Yes	Yes	Yes
Country of Destiny-Fund Fixed Effects	No	No	No	Yes	Yes	Yes	Yes	Yes
Log Lagged Weights=Relative Returns	0.000*	0.000*	0.446	0.000*	0.000*	0.000*	0.000*	0.000*
No. of Observations	458,458	458,458	458,458	458,458	458,458	458,458	62,949	26,018

*=1%, †=5%, ~=10%

IV. Behavior of Managers: Cash Weights

A. Equity Funds						
	Log Cash Weights					
Variables	Monthly				Semi Annual	Annual
Log Lagged Weights	0.587*	0.389*	0.360*	0.377*	0.112*	-0.083
	(0.006)	(0.008)	(0.008)	(0.009)	(0.024)	(0.050)
Relative Returns	0.729*	0.700*	0.169~	0.494*	0.188*	-0.181
	(0.083)	(0.102)	(0.088)	(0.099)	(0.071)	(0.138)
Country Crisis				0.096~	0.116	0.498~
				(0.051)	(0.158)	(0.284)
Global Crisis				0.158*	0.116†	0.111
				(0.018)	(0.049)	(0.101)
Origin Returns				-0.168	-0.437*	-0.034
				(0.116)	(0.097)	(0.119)
Fund Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	No	No	Yes	No	No	No
Log Lagged Weights=Relative Returns	0.087~	0.002*	0.029†	0.237	0.288	0.479

*=1%, †=5%, ~=10%

IV. Behavior of Managers: Flows?

- What can we learn about the behavior of flows to countries?

$$w_{ijt} = w_{ijt-1} \cdot \frac{(R_{ijt} + f_{ijt})}{(R_{it} + f_{it})}$$

- Log-linearizing

$$\omega_{ijt} = \underbrace{\omega_{ijt-1} + (r_{jt} - r_{it})}_{\text{buyandhold}} + (f_{ijt} - f_{it}) + \theta_{it} + \varepsilon_{ijt}$$

$$\omega_{ijt} = \alpha\omega_{ijt-1} + \beta(r_{jt} - r_{it}) + \theta_{it} + \varepsilon_{ijt}$$

- Using buy-and-hold benchmark
  - Flows are slightly negatively related to returns (counter-cyclical) in normal times
  - Funds are pro-cyclical during crises

IV. Behavior of Managers: Flows?

- Funds arguably use flows to adjust weights toward “desired” level
- How do desired weights respond to returns?
  - Hard to achieve general conclusions
  - Adjustment process and functional form of desired weights matter
- We use a partial adjustment model to derive some conclusions
  - Results imply large adjustment costs at high frequencies
  - Desired weights react more than 1 to 1 to relative returns
  - Flows do not adjust 1 to 1 to returns because of the adjustment costs, not because of purposeful under-reaction
- In absence of adjustment costs
  - Desired weights depend largely on lagged weights and relative returns
  - Desired weights do not adjust 1 to 1 with relative returns: slight under-reaction
- Decline in coefficient with frequency suggest adjustment cost story

IV. Behavior of Managers: Country Weights (Bonds)

B. Bond Funds								
	Log Country Weights							
	Monthly						Semi Annual	Annual
Log Lagged Weights	0.974*	0.969*	0.970*	0.868*	0.866*	0.866*	0.448*	0.102~
	(0.002)	(0.003)	(0.003)	(0.008)	(0.009)	(0.009)	(0.037)	(0.059)
Relative Returns	0.237*	0.238*	0.638*	0.219*	0.608*	0.611*	0.296*	0.310*
	(0.091)	(0.091)	(0.079)	(0.084)	(0.073)	(0.073)	(0.101)	(0.100)
Country Crisis						-0.016	-0.017	-0.026
						(0.011)	(0.050)	(0.084)
Fund Fixed Effects	No	Yes	No	No	No	No	No	No
Date Fixed Effects	No	Yes	No	No	No	No	No	No
Fund-Date Fixed Effects	No	No	Yes	No	Yes	Yes	Yes	Yes
Country of Destiny-Fund Fixed Effects	No	No	No	Yes	Yes	Yes	Yes	Yes
Log Lagged Weights=Relative Returns	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.127	0.023†
No. of Observations	39,183	39,183	39,183	39,183	39,183	39,183	5,035	1,959

*=1%, †=5%, ~=10%

IV. Behavior of Managers: Cash Weights (Bonds)

B. Bond Funds						
	Log Cash Weights					
Variables	Monthly				Semi Annual	Annual
Log Lagged Weights	0.654*	0.449*	0.446*	0.433*	0.119	-0.380†
	(0.022)	(0.029)	(0.029)	(0.030)	(0.078)	(0.176)
Relative Returns	-0.459~	-0.422	-0.682	-0.381	0.166	0.510~
	(0.264)	(0.303)	(0.456)	(0.298)	(0.257)	(0.295)
Country Crisis				-0.537*	-1.175~	-1.923~
				(0.172)	(0.670)	(1.057)
Global Crisis				-0.028	-0.039	0.371~
				(0.047)	(0.138)	(0.186)
Origin Returns				0.261	0.991	-0.362
				(0.520)	(0.949)	(0.930)
Fund Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	No	No	Yes	No	No	No
Log Lagged Weights=Relative Returns	0.000*	0.004*	0.015†	0.007*	0.867	0.010*

*=1%, †=5%, ~=10%

Presentation

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V. Gross and Net Country Flows

- Why do changes in mutual fund assets matter?
- They are related to capital flows to countries
- Then, explore role of investors and managers in capital movement
- “Gross flows”
  - Growth rate of total assets invested by mutual funds in a country
- “Net flows”
  - Gross flows minus the return in each country
  - Inflows/outflows into countries

V. Gross and Net Country Flows: Two Measures

- Gross Flows

$$\hat{A}_{jt} = \underbrace{\sum_i s_{ijt-1} \cdot \hat{w}_{ijt}}_{\substack{\text{Growth rate} \\ \text{of weights}}} + \underbrace{\sum_i s_{ijt-1} \cdot \hat{A}_{it}}_{\substack{\text{Growth rate} \\ \text{of fundassets}}}$$

- Net Flows

$$f_{jt} = \underbrace{\sum_i s_{ijt-1} \cdot \left(\hat{w}_{ijt} - \left(r_{jt} - r_{it}\right)\right)}_{\substack{\text{Return-adjusted} \\ \text{growthrate of weights}}} + \underbrace{\sum_i s_{ijt-1} \cdot f_{it}}_{\text{Injections}}$$

V. Gross Flows

	Shares (% of Country Growth Rate)		Variance Decomposition (% of Variance of Country Growth Rate)	
	Growth Rate of Weights	Growth Rate of Fund Assets	Growth Rate of Weights	Growth Rate of Fund Assets
All Countries	46.5%	53.5%	59.0%	41.0%
Type				
Active	49.3%	50.7%	57.9%	42.1%
Passive	21.7%	78.3%	32.0%	68.0%
Frequency				
Monthly	46.5%	53.5%	59.0%	41.0%
Semi-Annual	33.7%	66.3%	40.7%	59.3%
Annual	26.2%	73.8%	35.2%	64.8%

V. Net Flows

	Shares (% of Country Growth Rate)		Variance Decomposition (% of Variance of Country Growth Rate)	
	Return-Adjusted Growth Rate of Weights	Injections	Return-Adjusted Growth Rate of Weights	Injections
All Countries	88.4%	11.6%	84.8%	15.2%
Type				
Active	87.4%	12.6%	86.8%	13.2%
Passive	15.0%	85.0%	30.9%	69.1%
Frequency				
Monthly	88.4%	11.6%	84.8%	15.2%
Semi-Annual	83.3%	16.7%	78.9%	21.1%
Annual	80.6%	19.4%	73.0%	27.0%

V. Gross and Net Country Flows: Results

- Quantitative effects
  - A 10% decline in lagged fund returns reduces injections in 1 percentage point
  - If all funds investing in a country experience such decline gross flows will decline in 1 percentage point
  - This is close to the median gross flow across countries (2%)
  - A 10% decline in country of origin returns will reduce injections in 2 percentage points
  - A 10% decline in relative returns (holding fund returns constant) will induce a similar decline in gross flows
  - A country crisis would lead to a 2% decline in gross flows
  - A 10% decline in relative returns results in a 1 percentage point decline in relative flows
  - It is similar to the unweighted average growth in net flows in the sample (minus 1.5%)

V. Gross and Net Country Flows: Results

- Quantitative effects
  - If this relative return decline is accompanied by a low fund performance of low returns in the country of origin of funds that can induce large redemptions (4 to 5 percentage point decline)
  - For a shock to injections to have no effect on a country's net flows we need the relative flows to compensate in the same amount
  - In the case of a 2 percentage point decline resulting from country of origin returns, a similar 2 percent increase in relative inflows would be needed, which would occur if there is a 10% increase in relative returns
  - Only countries that are doing relatively well, above a minimum threshold, would not be seriously affected by shocks to the injections by underlying investors
  - Even in this case, contagion may be an important source of capital flows

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VI. Conclusions: Main Results

- MF assets fluctuate substantially over time, pro-cyclically
  - Particularly pronounced effects during crises
  - Large reallocations during global crisis, consistent with retrenchment
- Both investors and managers behind these movements, changing their investments substantially over time
- Neither managers nor investors exploiting potential arbitrage opportunities by being contrarian, especially during crises
- Capital flows
  - Both underlying investors and managers important for capital flows
- International MFs do not seem to have a stabilizing role
  - They amplify crises and transmit shocks across countries

VI. Conclusions: Main Results for Underlying Investors

- During good times (at home or abroad), they inject flows to international funds, and vice versa
- Not the case that bad shocks at home country propel more investments abroad, to the contrary
- Underlying investors do not act either as deep-pocket international investors buying assets abroad at fire sale prices
- They also chase returns in funds that do well
- This behavior exerts pressure on managers, who need to react to these shocks

VI. Conclusions: Main Results for Managers

- Evidence not consistent with constant country weights
- In fact, weights change substantially over time
- Portfolios adjust in short run, large pass-through from prices
  - Over time, weights get adjusted
  - Evidence consistent with adjustment costs
  - And perhaps with changes in target weights, fluctuating with returns
- In relative terms, during normal times managers reallocate some money to countries that are doing bad
- But they move away from countries experiencing crises
- Cash positions actively used, differently for equity and bonds
  - For equity, cash is used pro-cyclically, accumulated during crises
  - For bonds, more cash as a cushion, which is used counter-cyclically

VI. Conclusions: Main Results

- Bond vs. equity funds
  - More evidence for equity funds (more funds and more crises)
  - Returns not as large effects for bond funds, perhaps due to inability to liquidate portfolios
  - Cash positions more used for bond funds

VI. Conclusions: What We Learn

- Underlying investors retrench as home country do badly
  - Wealth effects dominate substitution effects
  - Transmission mechanism, beyond market discipline linked to returns
- Equity fund flows slightly counter-cyclical during normal times and pro-cyclical during crises
  - Findings can shed light on heterogeneity of behavior of equity funds in literature (e.g., Hau and Rey)
- Equity fund flows relatively more pro-cyclical (to returns) than bond funds
  - Amplification versus contagion effects
- Further thinking on the adjustment process of mutual fund flows required: adjustment costs versus desired weights

VI. Conclusions: What We Learn

- The financial channel important in the transmission of shocks
- With micro-data, able to distinguish with more granularity how different parts of the financial sector interact
  - Sheds more light on “black box” discussed in the literature and presented in aggregate data
  - Of course, mutual funds not the only nor most important actor

VI. Conclusions: What We Learn

- Framework to understand inner-workings of financial institutions
  - But only another step in this direction, more research is needed
- Important for literature on crisis transmission
  - Shocks to supply side of funds seem hard to dismiss
  - This has important policy lessons in terms of liquidity provision and moral hazard
  - Actions by different players within institutions interact, get magnified
  - No stabilizing effects of foreign investors, buying at fire sale prices
  - Deep pocket investors not performing long-term arbitrage

Thank you!