International Asset Allocations and Capital Flows: The Benchmark Effect

Claudio Raddatz   Sergio Schmukler   Tomas Williams

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I. Motivation

- Many theories and empirical work on how capital is invested internationally

- Literature tends to focus on fundamentals

- Here, focus on benchmarks, mostly ignored by the literature

- "The benchmark effect"

  – Various channels through which popular stock and bond market indexes affect asset allocations and capital flows across countries

  – E.g., World, EM, BRIC from MSCI

  – E.g., GBI, EMBI from JPM

I. Motivation

- Mutual funds "declare" indexes as benchmarks

- Increasingly more funds "track" indexes passively

  - ETFs (costs, transparency, etc.)

- Still actively managed funds remain at about 80% of industry

- Changes in country composition of benchmarks → Changes in country composition of mutual fund portfolios

  - Changes in capital flows

  - Changes in asset prices

I. Motivation: Contribution and main findings

- Micro-level dataset of country portfolio allocations, *weights*, of large number of equity and bond mutual funds

- … and respective benchmarks

- Benchmarks useful for identification with important effects on equity and bond mutual funds, passive and active

- Changes in benchmark weights *'cause'* changes in country weights
  - Unrelated to industry, macroeconomic, and country-specific time-varying effects
  - Exogenous, pre-announced changes with effects when these changes are implemented
  - Reverse causality and common shocks do not drive the results
  - Effect stronger for passive funds but still present for active ones
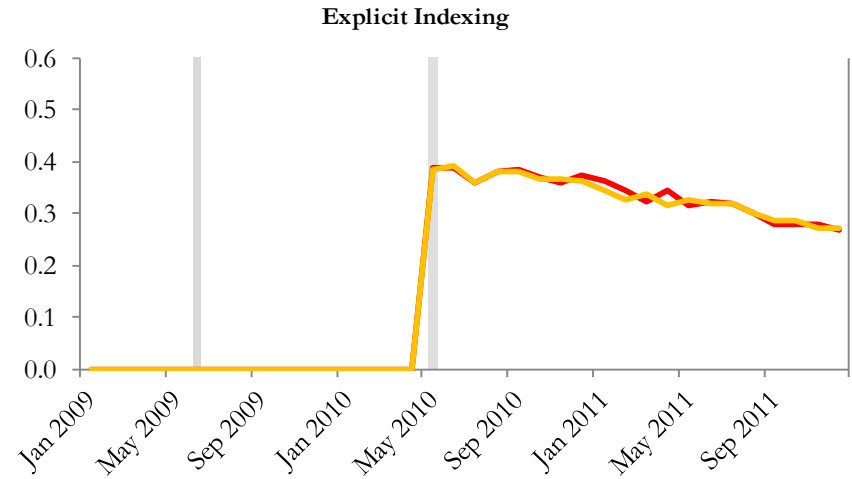
I. Motivation: Main findings

- Benchmarks affect capital flows through impact on weights

- Benchmarks have systemic effects as reflected in asset prices
  - Assets in the benchmarks experience abnormal returns when benchmark changes become effective
  - Reallocations implied by those changes are not immediately arbitraged away

- Counterintuitive movements
  - Countries doing well may suffer larger outflows during sudden stop
  - An upgrade of a country may result in capital outflows and falls in asset prices
  - Contagion effects by linking different countries in portfolio

I. Motivation: Israel upgrade from EM to DM

A. Global Emerging Funds and MSCI Emerging Markets Index
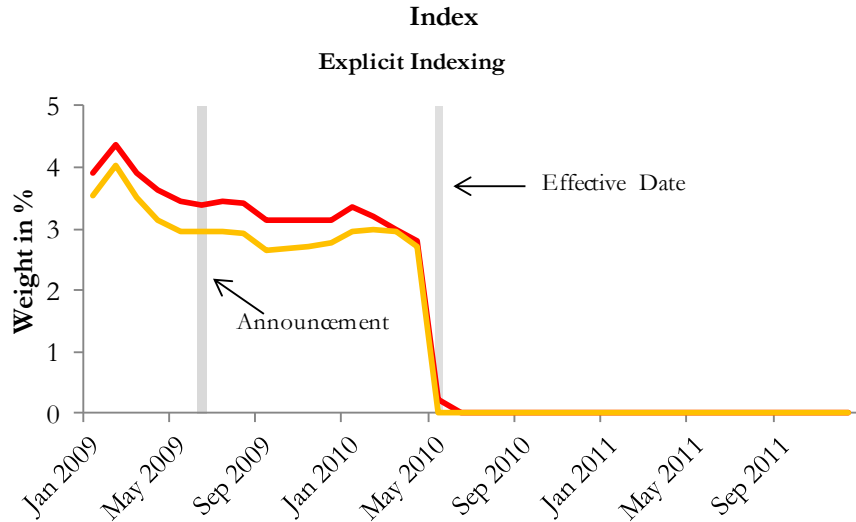
Explicit Indexing

B. Global Funds and MSCI World Index

Explicit Indexing

C. Global Emerging Funds and MSCI Emerging Markets Index

Truly Active

D. Global Funds and MSCI World Index

Truly Active

— Average Mutual Fund Weight   — Benchmark Weight
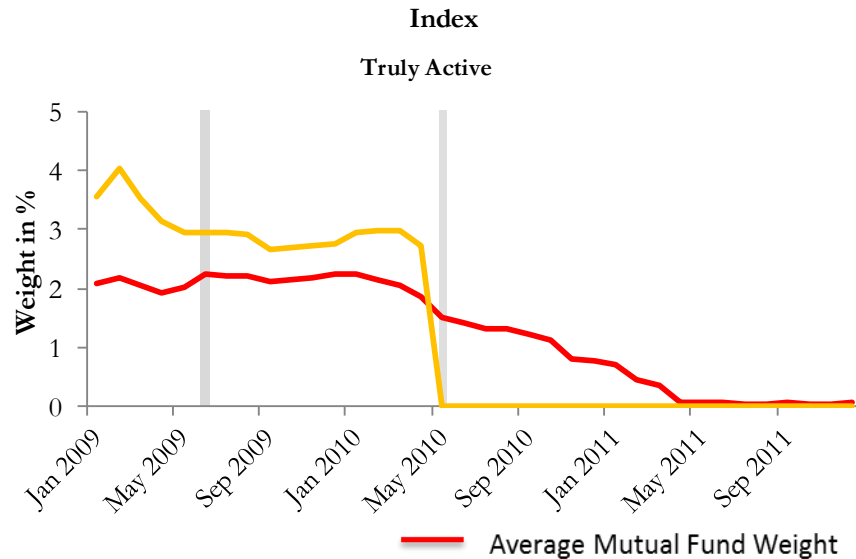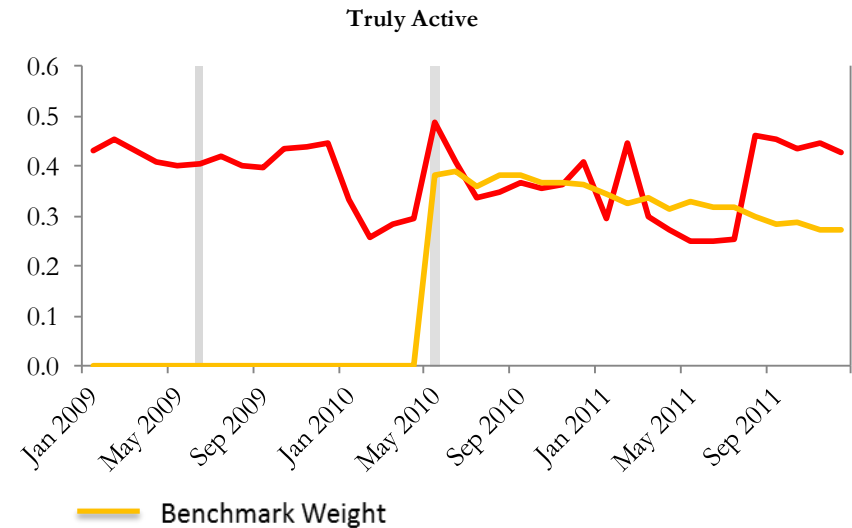
I. Motivation

- Portugal (1997) and Greece (2001)
    - From the MSCI EM Index to the World Index

- Argentina (2009) and Greece (2013)
    - Argentina downgraded to FM status, Greece back to EM status, a first

- Korea and Taiwan (2013)
    - Speculation about possible upgrade and effects on flows
    - Korea's market cap is 15% percent of the MSCI EM index, while it would be 2% percent of the MSCI DM index
    - Taiwan's market cap is 11% percent of the MSCI EM index, while it would be 1.5% percent of the MSCI DM index
    - But MSCI announced that they will not be upgraded to DM status

- Qatar and UAE (2014)
    - Upgraded from FM to EM in May

Presentation

I. Motivation

II. Data

III. Benchmarks

IV. Asset Allocations

V. Capital Flows

VI. Price Effects

VII. Conclusions

III. Benchmarks: Within country-time dispersion

- Changes in benchmark weights relate to <u>relative</u> returns

$$w_{ct}^B = \underbrace{w_{ct-1}^B (R_{ct}/R_t^B)}_{Buy \; and \; Hold} + \underbrace{E_{ct}^B}_{"Exogenous"}$$

- Country weight can move in opposite directions in different benchmarks (same country, same time)

III. Benchmarks: Brazil during the pre-crisis (2003-2007)
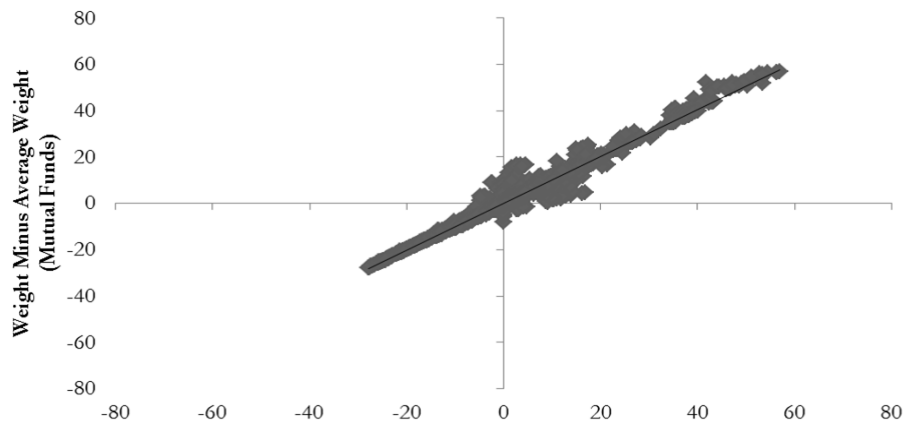

Brazil Benchmark Weight (Jan 2005=100)
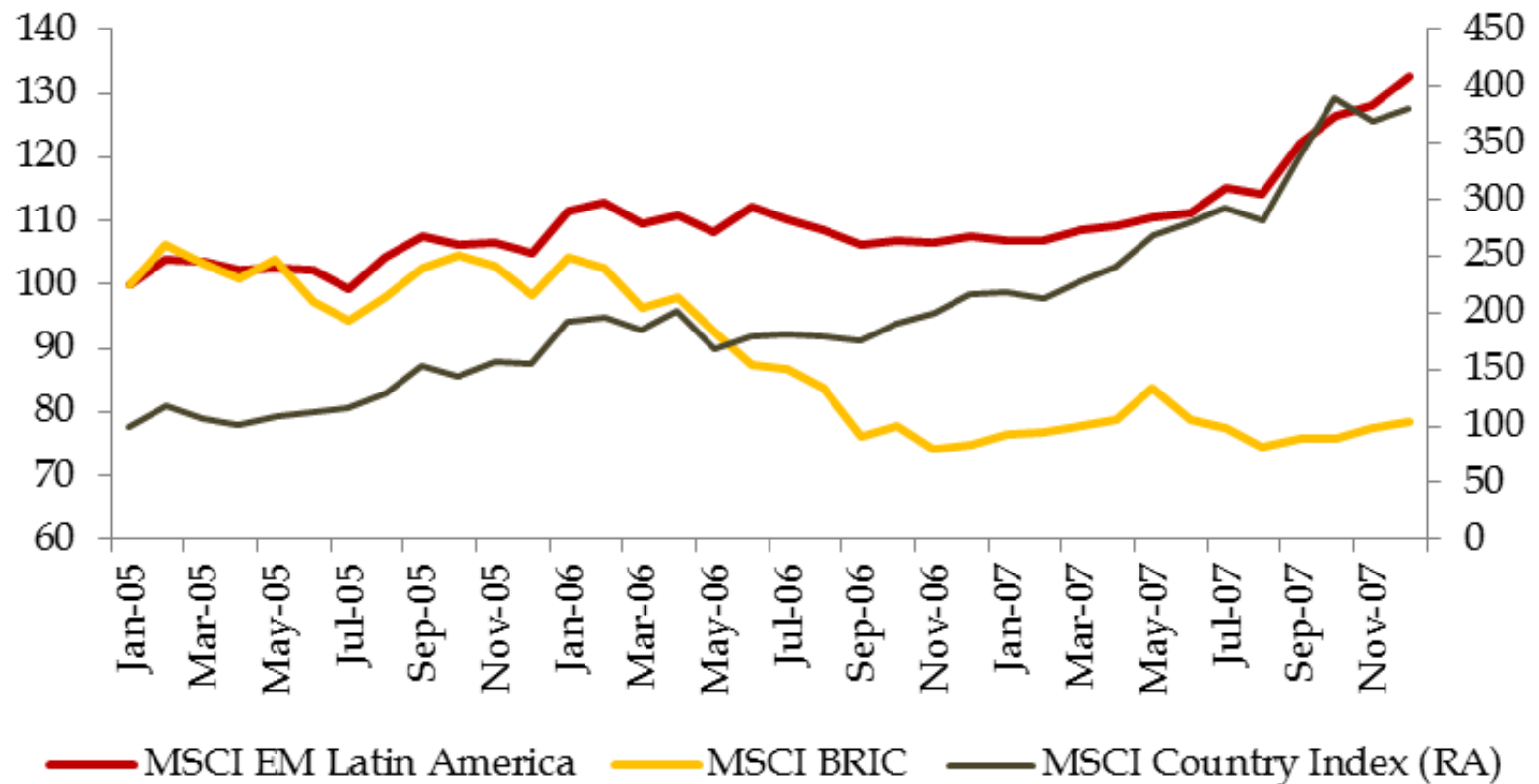
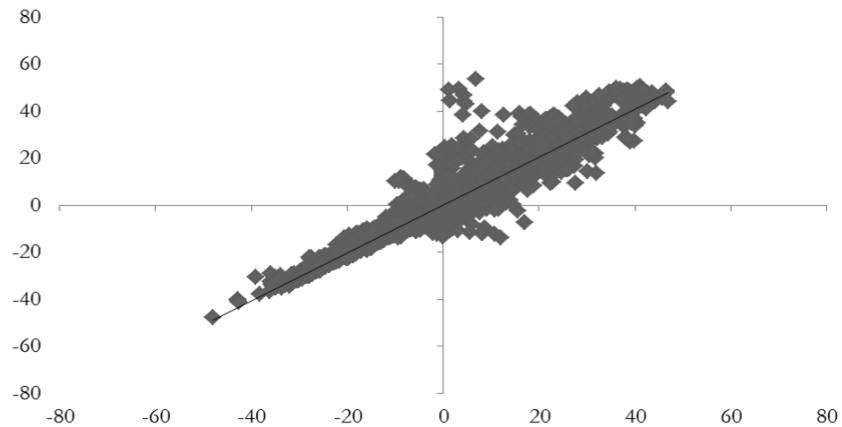# III. Benchmarks: Exogenous event vs. normal times
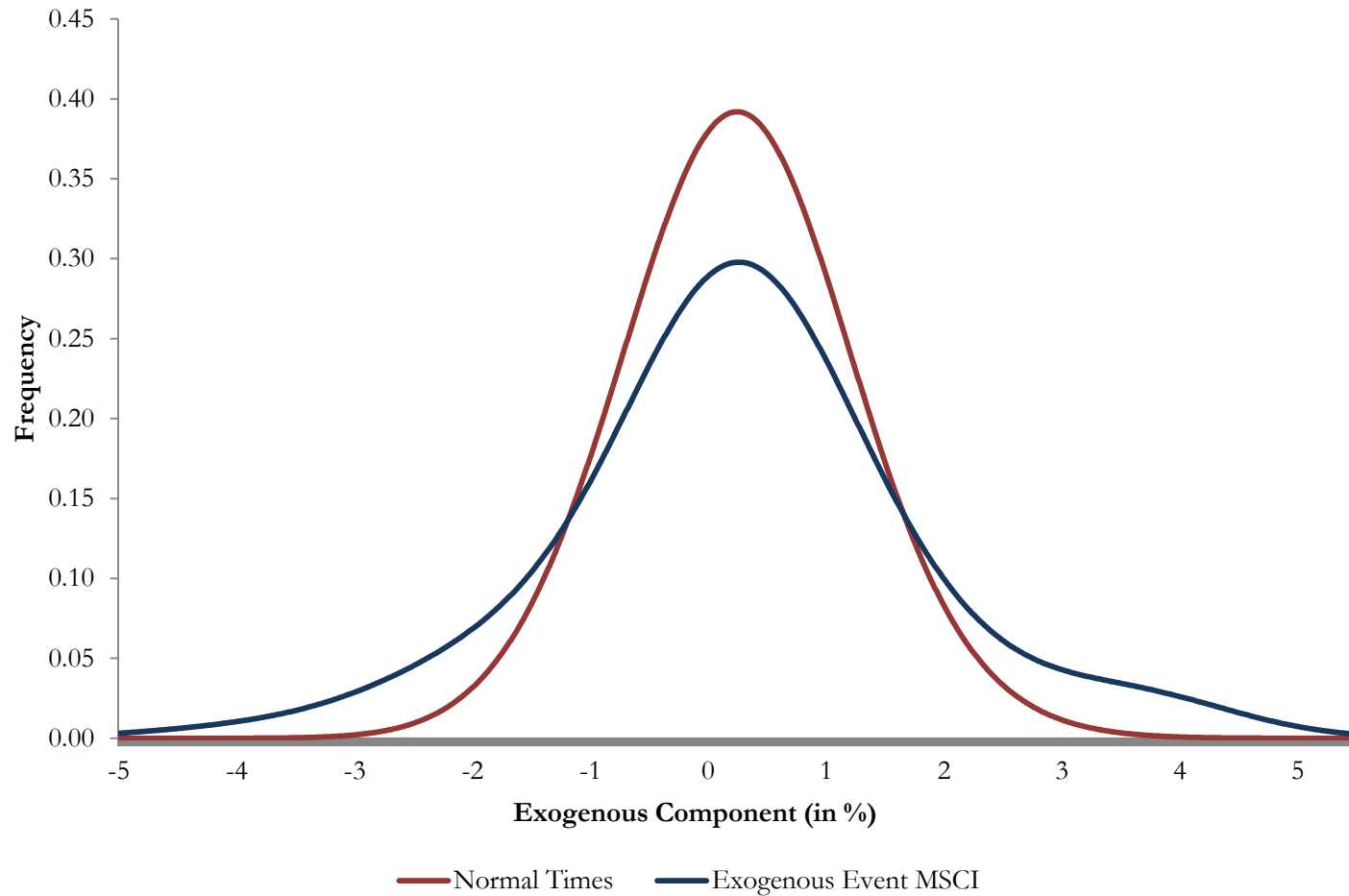
IV. Log weights versus log benchmark weights

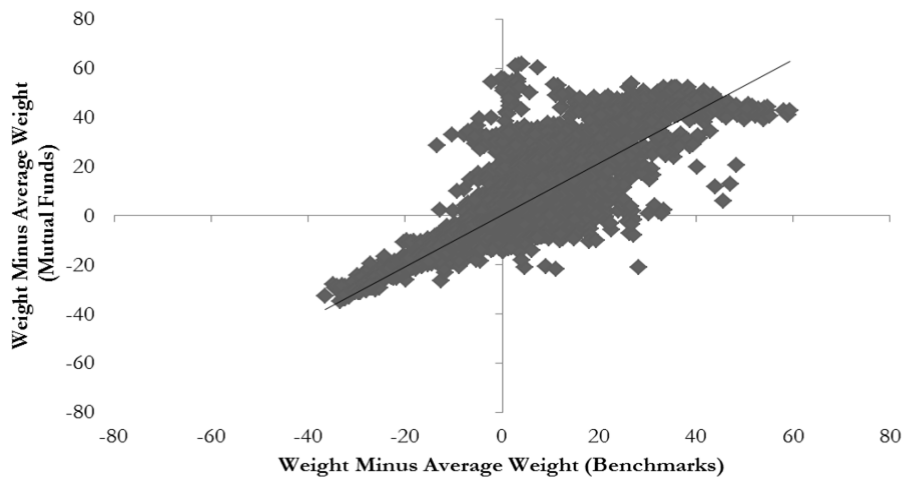$$w_{ict} - \widehat{w}_{ct} \ vs. \ w_{ict}^{B} - \widetilde{w}_{ct}^{B}$$
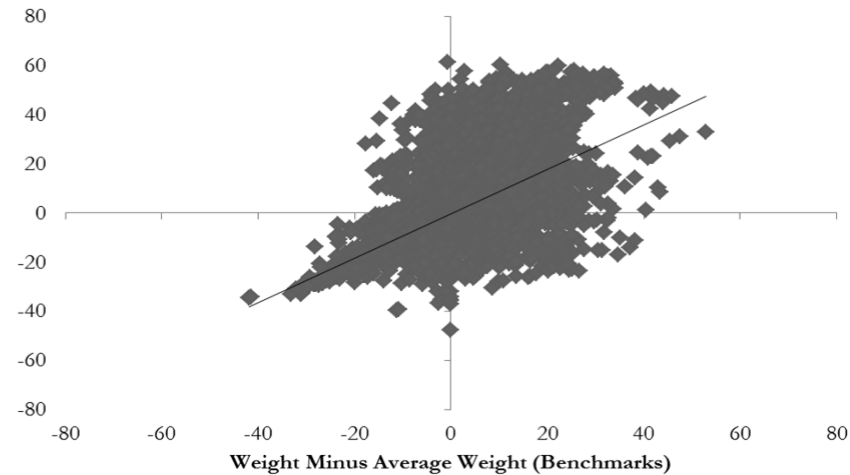

Explicit Indexing

Closet Indexing

Mildly Active

Truly Active

IV. Log weights versus log benchmark weights

Variable	Total Sample	Degree of Activism			
		Explicit Indexing	Closet Indexing	Mildly Active	Truly Active
		Equity Funds			

Equity Funds

Variable	Total Sample	Explicit Indexing	Closet Indexing	Mildly Active	Truly Active
Weights					
Benchmark Weights	0.823***	0.971***	0.961***	0.867***	0.598***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.004)
Fund-Country Fixed Effects	No	No	No	No	No
Fund-Time Fixed Effects	No	No	No	No	No
Observations	2,524,798	42,029	577,241	988,198	917,330
R-Squared	0.725	0.975	0.941	0.817	0.401
Weights					
Benchmark Weights	0.773***	0.921***	0.919***	0.819***	0.499***
	(0.008)	(0.013)	(0.011)	(0.010)	(0.009)
Fund-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	2,524,798	42,029	577,241	988,198	917,330
R-Squared	0.912	0.989	0.966	0.907	0.842
Log Weights					
Log Benchmark Weights	0.821***	0.974***	0.969***	0.823***	0.662***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Fund-Country Fixed Effects	No	No	No	No	No
Fund-Time Fixed Effects	No	No	No	No	No
Observations	1,597,666	36,562	447,185	631,546	482,373
R-Squared	0.601	0.950	0.785	0.617	0.399
Log Weights					
Log Benchmark Weights	0.747***	0.970***	0.904***	0.754***	0.575***
	(0.007)	(0.011)	(0.009)	(0.008)	(0.007)
Fund-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,597,666	36,562	447,185	631,546	482,373
R-Squared	0.851	0.982	0.899	0.823	0.825

IV. Log weights versus log benchmark weights

Bond Funds

Variable	Total Sample		Explicit Indexing	Closet Indexing	Mildly Active	Truly Active
			Degree of Activism			
Weights						
Benchmark Weights	0.714***		0.671***	0.876***	0.750***	0.392***
	(0.006)		(0.008)	(0.006)	(0.007)	(0.013)
Fund-Country Fixed Effects	No		No	No	No	No
Fund-Time Fixed Effects	No		No	No	No	No
Observations	153,402		723	57,338	57,335	38,006
R-Squared	0.360		0.863	0.679	0.419	0.077
Weights						
Benchmark Weights	0.697***		0.424***	0.935***	0.843***	0.223***
	(0.022)		(0.032)	(0.015)	(0.023)	(0.040)
Fund-Country Fixed Effects	Yes		Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	Yes		Yes	Yes	Yes	Yes
Observations	153,402		723	57,338	57,335	38,006
R-Squared	0.750		0.991	0.834	0.741	0.689
Log Weights						
Log Benchmark Weights	0.761***		0.789***	0.900***	0.772***	0.423***
	(0.007)		(0.005)	(0.007)	(0.007)	(0.011)
Fund-Country Fixed Effects	No		No	No	No	No
Fund-Time Fixed Effects	No		No	No	No	No
Observations	87,687		676	36,611	33,034	17,366
R-Squared	0.394		0.838	0.610	0.421	0.093
Log Weights						
Log Benchmark Weights	0.585***		0.640***	0.753***	0.590***	0.229***
	(0.019)		(0.043)	(0.025)	(0.022)	(0.033)
Fund-Country Fixed Effects	Yes		Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	Yes		Yes	Yes	Yes	Yes
Observations	87,687		676	36,611	33,034	17,366
R-Squared	0.777		0.990	0.809	0.763	0.747

IV. Benchmarks and asset allocations

- Is it really benchmark weights?

  - Long-term relation

  - Omitted variables: Industry

  - Omitted variables: Country

  - Buy-and-hold effect

IV. Benchmarks or industry?

		Equity Funds			
		Degree of Activism			
Explanatory Variables	Total Sample	Explicit Indexing	Closet Indexing	Mildly Active	Truly Active
	Dependent Variable: Weights, Monthly				
Benchmark Weights	0.673 ***	0.846 ***	0.890 ***	0.648 ***	0.347 ***
	(0.011)	(0.018)	(0.012)	(0.014)	(0.011)
Industry Weights	0.358 ***	0.196 ***	0.168 ***	0.444 ***	0.497 ***
	(0.011)	(0.023)	(0.017)	(0.013)	(0.011)
Fund-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	2,524,798	42,029	577,241	988,198	917,330
R-Squared	0.914	0.989	0.967	0.910	0.845
	Dependent Variable: Weights, Semiannual				
Benchmark Weights	0.711 ***	0.880 ***	0.906 ***	0.721 ***	0.389 ***
	(0.028)	(0.039)	(0.029)	(0.036)	(0.027)
Industry Weights	0.365 ***	0.129 ***	0.239 ***	0.421 ***	0.499 ***
	(0.026)	(0.045)	(0.043)	(0.033)	(0.030)
Fund-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	468,574	8,040	109,674	180,632	170,228
R-Squared	0.912	0.985	0.965	0.907	0.846

IV. Country fundamentals

|		Equity Funds			
			Degree of Activism		
Explanatory Variables	Total Sample	Explicit Indexing	Closet Indexing	Mildly Active	Truly Active
		Dependent Variable: Weights			
Benchmark Weights	0.792 ***	0.928 ***	0.902 ***	0.766 ***	0.582 ***
	(0.007)	(0.010)	(0.009)	(0.010)	(0.010)
Macro Variables as Controls	Yes	Yes	Yes	Yes	Yes
Fund-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country-Time Fixed Effects	No	No	No	No	No
Observations	1,164,590	26,558	321,412	464,292	352,328
R-Squared	0.943	0.997	0.976	0.929	0.898
		Dependent Variable: Weights			
Benchmark Weights	0.743 ***	0.981 ***	0.928 ***	0.680 ***	0.423 ***
	(0.010)	(0.018)	(0.009)	(0.017)	(0.014)
Macro Variables as Controls	No	No	No	No	No
Fund-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes
Fund-Time Fixed Effects	No	No	No	No	No
Country-Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,665,785	37,764	458,745	657,672	511,604
R-Squared	0.929	0.997	0.976	0.922	0.864

V. Effects on capital flows: Impact of various shocks

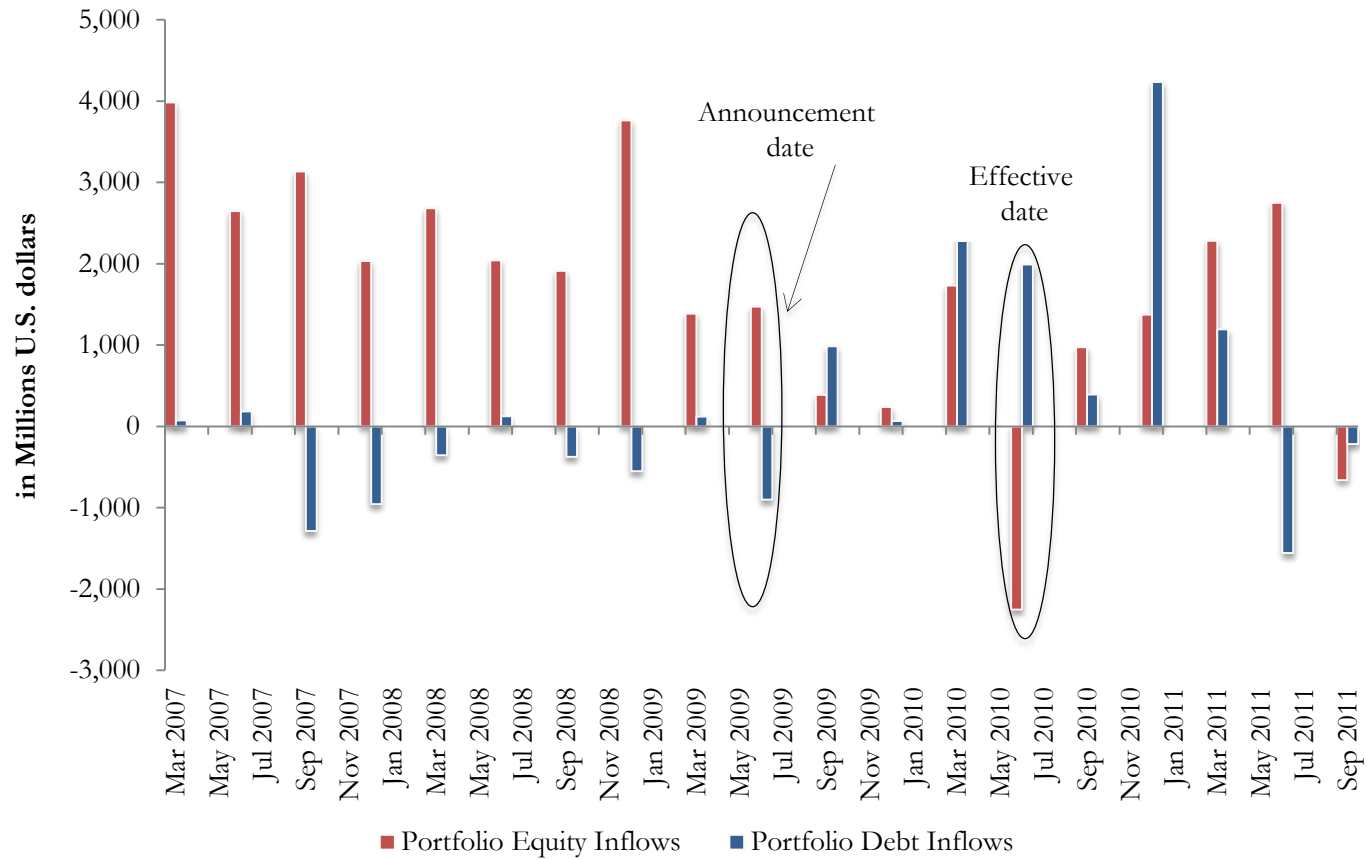- Benchmark weights and capital flows linked through identity

$$F_{ict} = \underbrace{w_{ict}F_{it}}_{\text{Net Inflows}} + \underbrace{\tilde{A}_{it}\left(w_{ict} - w_{ict}^{BH}\right)}_{\text{Reallocation}}$$

- Direct benchmark effect: change in benchmark weight

- Sensitivity effect: change in inflows

- Amplification effect: change in own returns

- Contagion effect: change in others' returns

V. Direct benchmark effect: Israel's upgrade (May 2010)

Total Country Flows
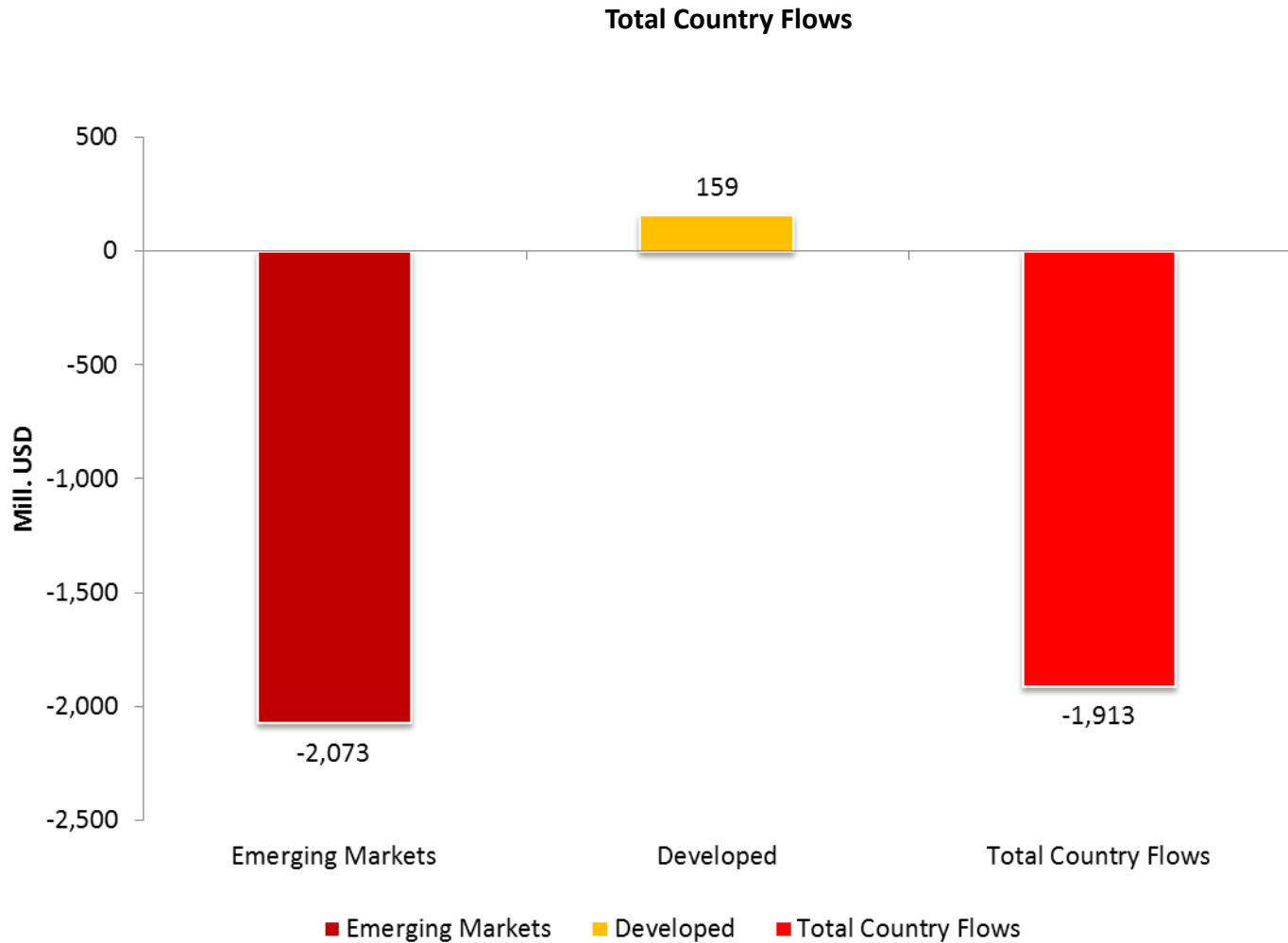
V. Direct benchmark effect in Israel BoP

V. Effects on capital flows: Quantification of the effects

- Benchmark weights and capital flows linked through identity

$$F_{ict} = \underbrace{w_{ict}^B F_{it}}_{\substack{\text{Benchmark} \\ \text{flows}}} + \underbrace{\Delta_{ict}^B F_{it}}_{\substack{\text{Active} \\ \text{flows}}} + \underbrace{\tilde{A}_{it}\left[w_{ict}^B - w_{ict-1}^B \frac{R_{ct}}{R_{it}}\right]}_{\substack{\text{Benchmark} \\ \text{reallocation}}} + \underbrace{\tilde{A}_{it}\left[\Delta_{ict}^B - \Delta_{ict-1}^B \frac{R_{ct}}{R_{it}}\right]}_{\substack{\text{Active} \\ \text{reallocation}}},$$

where $\Delta_{ict}^B = w_{ict} - w_{ict}^B$

V. Effects on capital flows: Quantification of the effects

Sample	Benchmark Flow (1)	Active Flow (2)	Benchmark Reallocation (3)	Active Reallocation (4)	Total Benchmark Component: (1)+(3)	Total Active Component: (2)+(4)
A. Total Sample						
All Funds	16.1	4.6	22.6	56.7	38.7	61.3
Explicit Indexing	50.7	3.7	17.1	28.5	67.8	32.2
Closet Indexing	21.1	1.8	15.0	62.0	36.1	63.9
Mildly Active	12.7	3.2	21.0	63.2	33.7	66.3
Truly Active	7.9	9.0	12.3	70.8	20.2	79.8
B. Normal Times						
All Funds	9.4	7.5	4.9	78.2	14.3	85.7
Explicit Indexing	49.6	5.3	13.3	31.8	62.9	37.1
Closet Indexing	8.1	2.2	4.5	85.2	12.6	87.4
Mildly Active	4.6	6.0	6.9	82.6	11.4	88.6
Truly Active	1.5	15.4	2.3	80.9	3.8	96.2

V. Effects on capital flows: Quantification of the effects

| Sample	Benchmark Flow (1)	Active Flow (2)	Benchmark Reallocation (3)	Active Reallocation (4)	Total Benchmark Component: (1)+(3)	Total Active Component: (2)+(4)
C. Event Times						
All Funds	48.6	3.1	24.1	24.2	72.7	27.3
Explicit Indexing	62.6	0.5	15.1	21.8	77.7	22.3
Closet Indexing	22.6	2.2	18.8	56.4	41.4	58.6
Mildly Active	13.6	3.0	23.6	59.7	37.2	62.8
Truly Active	8.9	8.8	14.0	68.3	22.9	77.1
D. MSCI Index Rebalancing						
All Funds	5.8	3.7	32.7	57.8	38.5	61.5
Explicit Indexing	8.3	1.1	34.8	55.7	43.1	56.9
Closet Indexing	5.7	0.8	27.9	65.6	33.6	66.4
Mildly Active	8.6	4.8	33.4	53.1	42.0	58.0
Truly Active	1.3	3.6	19.0	76.1	20.3	79.7

V. Effects on capital flows: Quantification of the effects

| Sample	Benchmark Flow (1)	Active Flow (2)	Benchmark Reallocation (3)	Active Reallocation (4)	Total Benchmark Component: (1)+(3)	Total Active Component: (2)+(4)
A. Argentina						
All Funds	6.8	2.3	35.5	55.4	42.3	57.7
Explicit Indexing	17.2	0.6	47.5	34.8	64.7	35.3
Closet Indexing	10.3	1.2	26.1	62.5	36.4	63.6
Mildly Active	8.4	3.4	41.4	46.8	49.8	50.2
Truly Active	0.9	6.7	3.4	89.0	4.3	95.7
B. Colombia						
All Funds	12.6	5.4	27.5	54.5	40.1	59.9
Explicit Indexing	23.4	6.0	22.9	47.7	46.3	53.7
Closet Indexing	13.6	5.4	18.4	62.6	32.0	68.0
Mildly Active	7.1	3.6	19.6	69.8	26.7	73.3
Truly Active	11.6	8.3	10.4	69.7	22.0	78.0

V. Effects on capital flows: Quantification of the effects

Sample	Benchmark Flow (1)	Active Flow (2)	Benchmark Reallocation (3)	Active Reallocation (4)	Total Benchmark Component: (1)+(3)	Total Active Component: (2)+(4)
			C. Israel			
All Funds	3.6	1.2	62.9	32.3	66.5	33.5
Explicit Indexing	4.6	0.7	88.7	6.0	93.3	6.7
Closet Indexing	6.6	1.7	54.6	37.0	61.2	38.8
Mildly Active	7.4	3.3	43.9	45.3	51.4	48.6
Truly Active	3.0	2.4	44.3	50.4	47.3	52.7
			D. Venezuela			
All Funds	7.5	2.6	39.1	50.7	46.7	53.3
Explicit Indexing	0.8	0.4	45.0	53.8	45.8	54.2
Closet Indexing	12.6	3.8	37.1	46.5	49.7	50.3
Mildly Active	9.7	3.2	31.6	55.5	41.3	58.7
Truly Active	1.4	15.9	10.2	72.5	11.6	88.4

VI. Price effects: Israel's upgrade and stock market returns
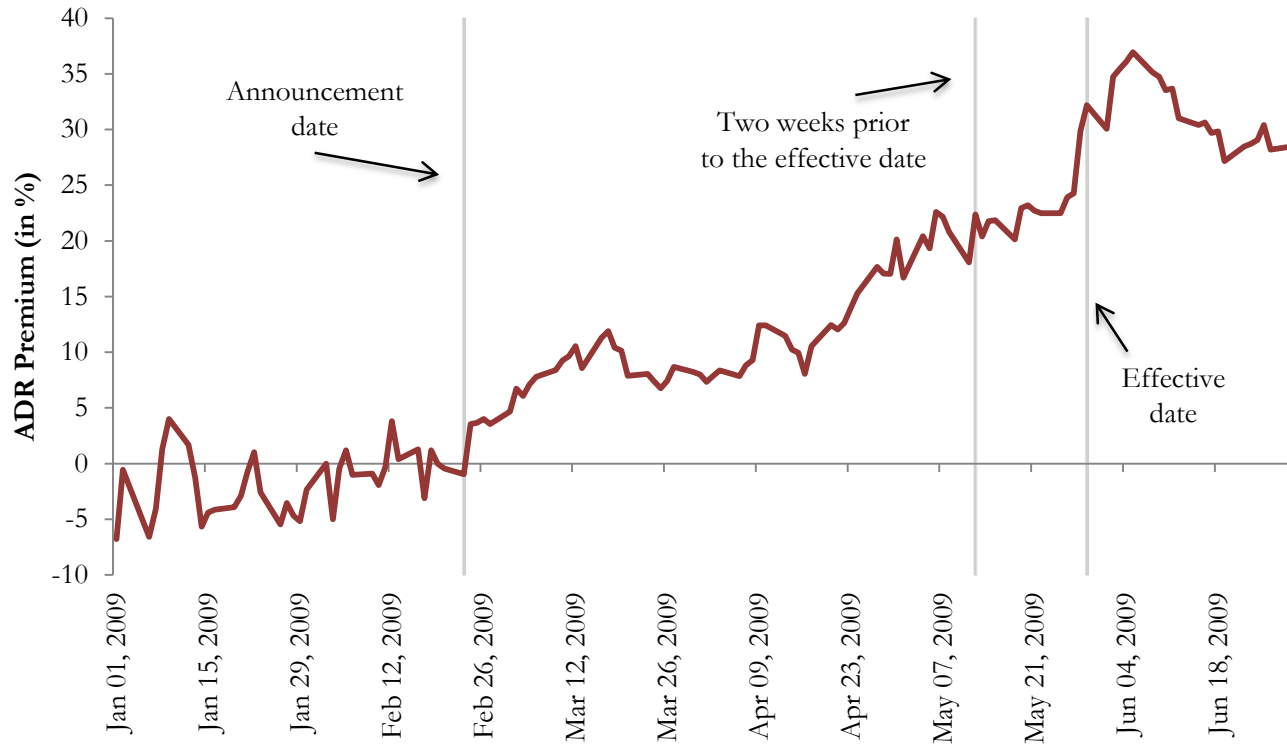
Announcement Date
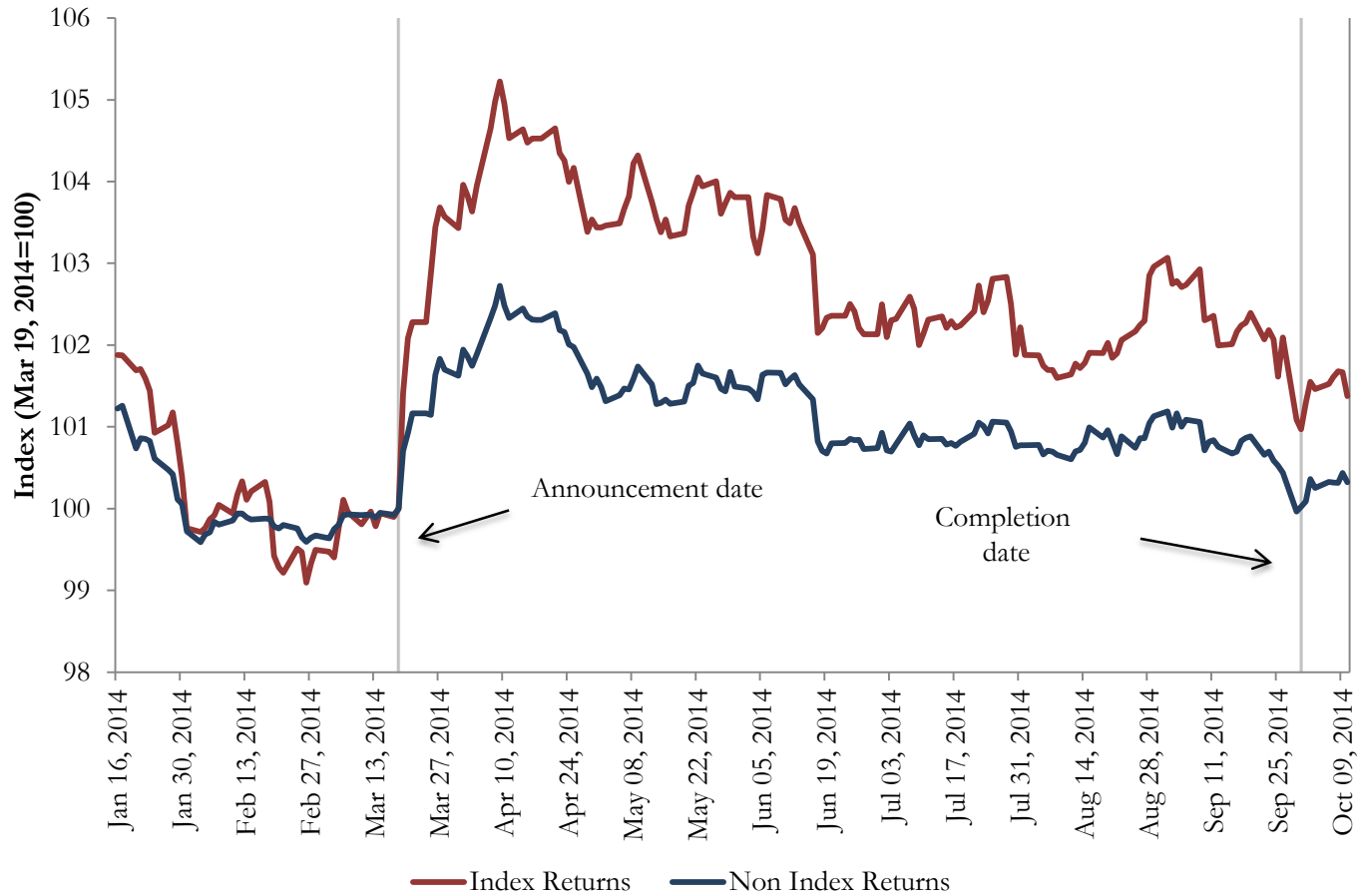

Announcement date
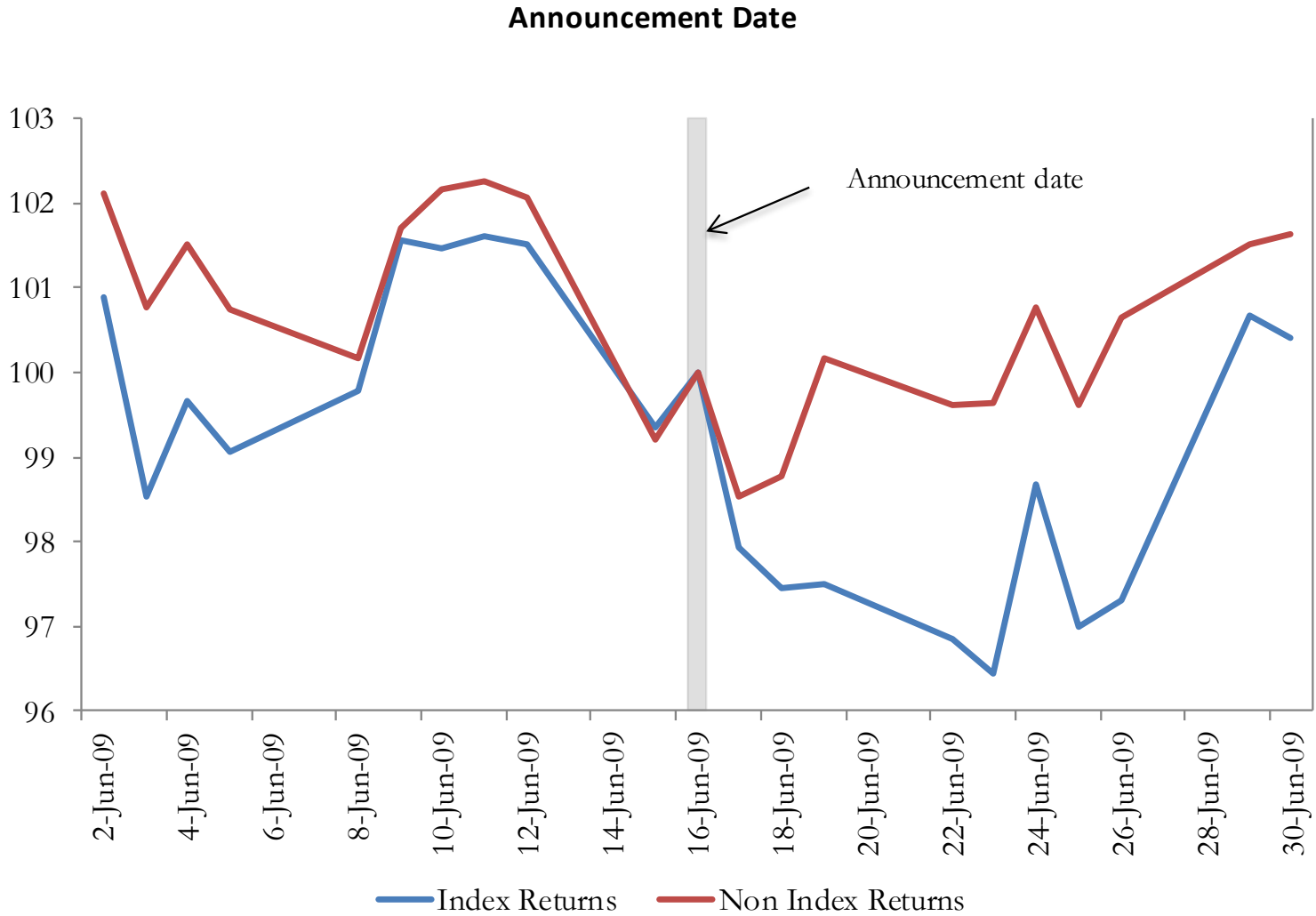
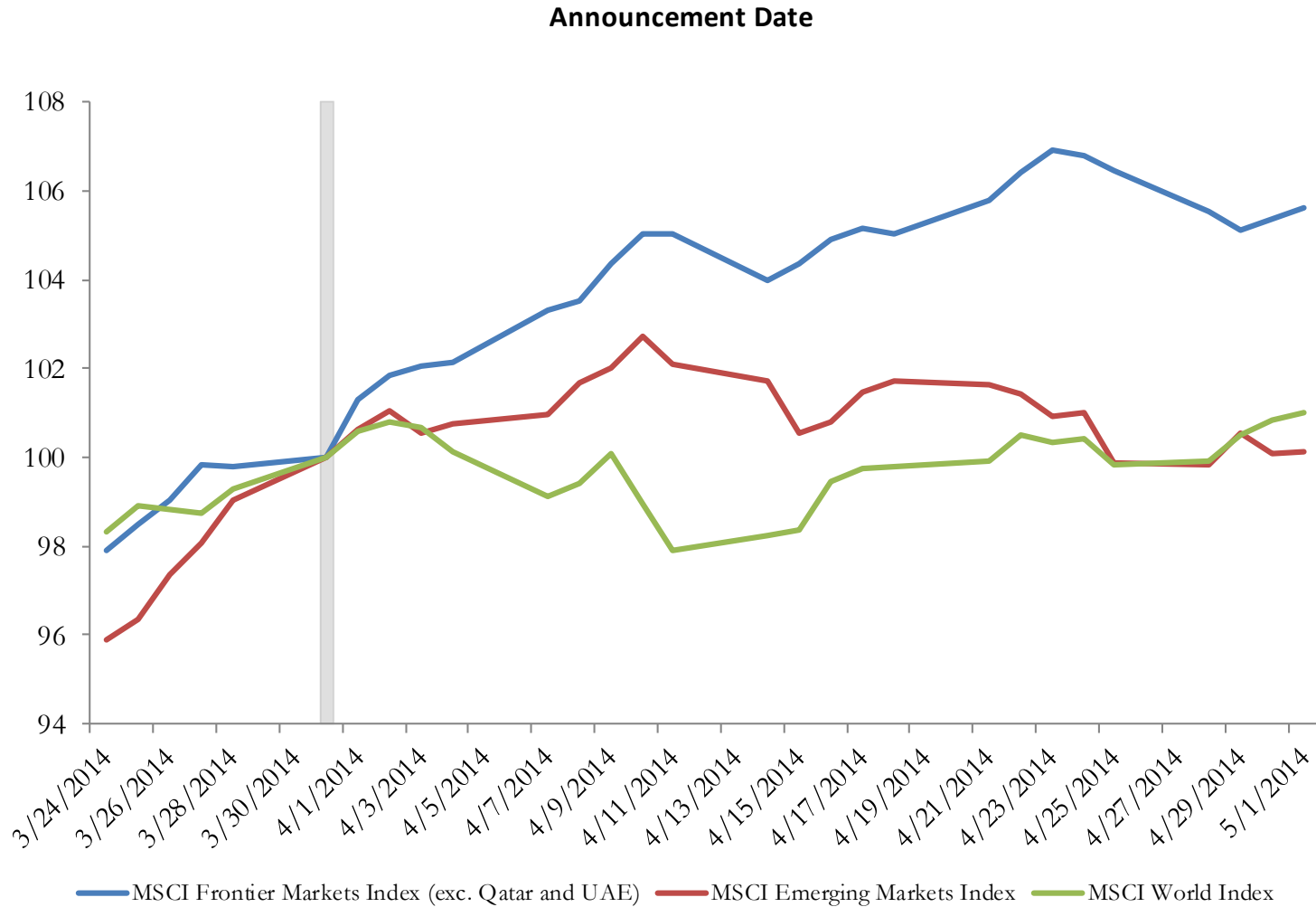# VI. Price effects: Israel's upgrade and stock market returns
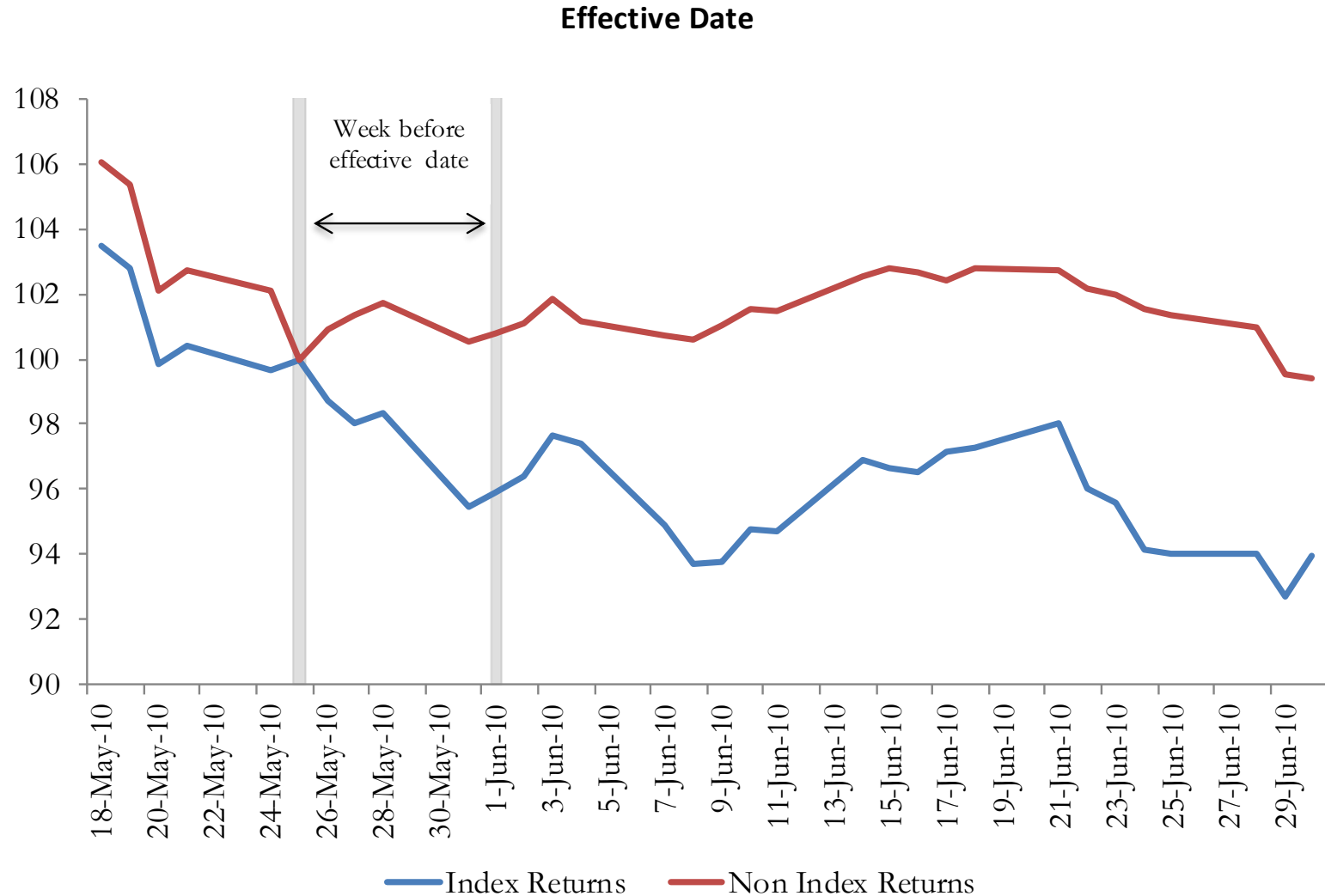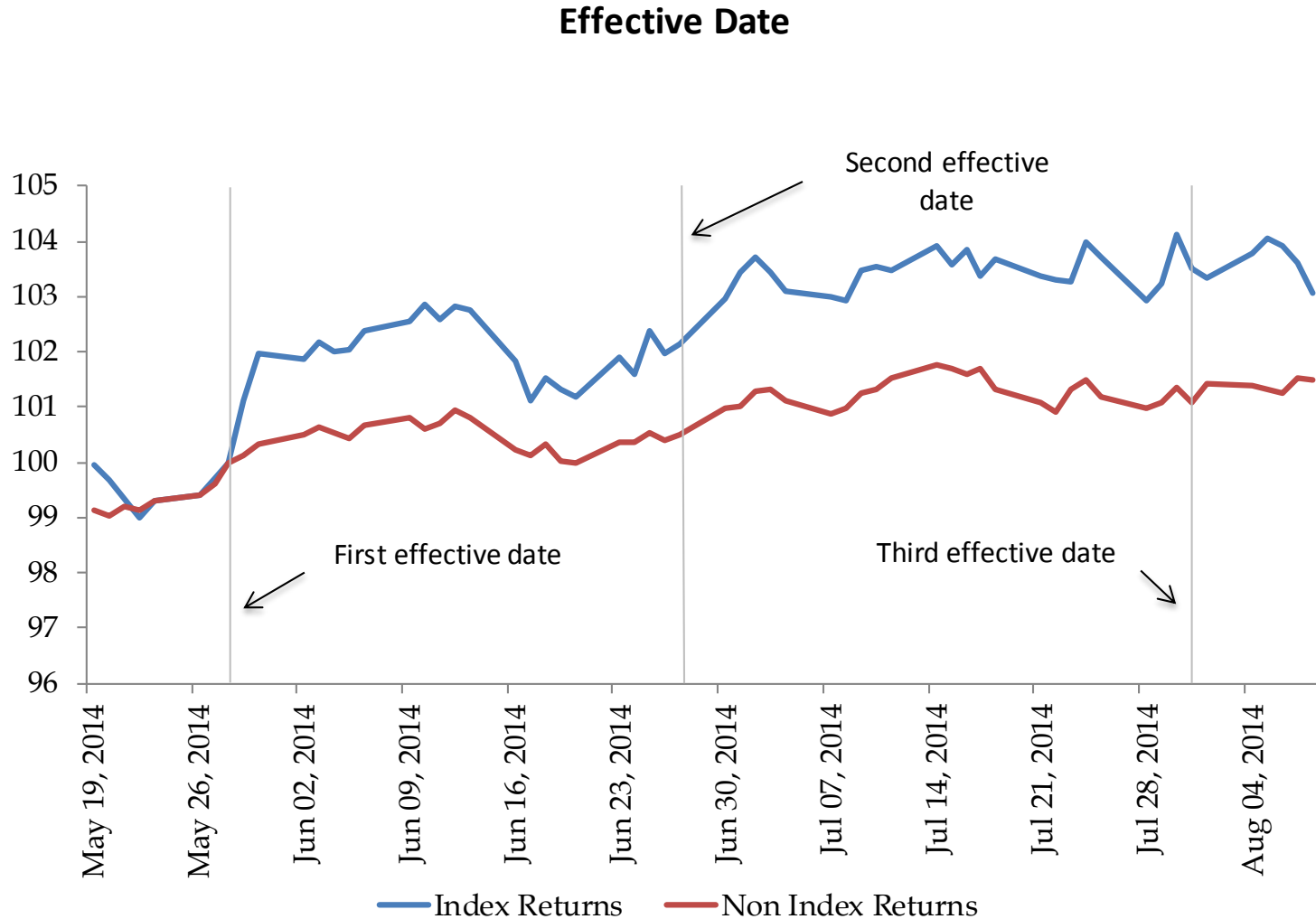
VI. Price effects: Direct benchmark effect – Argentina

VI. Price effects: Direct benchmark effect – Colombia

VI. Price effects: Contagion in frontier markets; Qatar, UAE

Announcement Date

Legend: MSCI Frontier Markets Index (exc. Qatar and UAE) — MSCI Emerging Markets Index — MSCI World Index

VI. Price effects: Contagion in frontier markets

Effective Date

VI. Price Effects: Event Study Analysis

Time	Raw Returns	Excess Returns	Abnormal Returns
A. Announcement (t_A) and Effective Date (t_E)			
Returns on (t_A-2) and Returns on (t_E-12)	0.065	-0.011	-0.164
	(0.291)	(0.277)	(0.203)
Cumulative Returns between (t_A-2) and (t_A) and Cumulative Returns between (t_E-12) and (t_E-10)	0.916 ***	0.633 ***	0.455 **
	(0.312)	(0.256)	(0.232)
Cumulative Returns between (t_A-2) and (t_A+5) and Cumulative Returns between (t_E-12) and (t_E-5)	1.481 ***	1.105 ***	0.839 ***
	(0.360)	(0.320)	(0.276)
Cumulative Returns between (t_A-2) and (t_A+10) and Cumulative Returns between (t_E-12) and (t_E)	2.700 ***	1.629 ***	1.442 ***
	(0.501)	(0.431)	(0.416)
Cumulative Returns between (t_A-2) and (t_A+15) and Cumulative Returns between (t_E-12) and (t_E+5)	2.971 ***	2.047 ***	1.644 ***
	(0.593)	(0.485)	(0.462)
Cumulative Returns between (t_A-2) and (t_A+20) and Cumulative Returns between (t_E-12) and (t_E+15)	2.480 ***	1.793 ***	1.207 **
	(0.641)	(0.502)	(0.569)
Cumulative Returns between (t_A-2) and (t_A+30) and Cumulative Returns between (t_E-12) and (t_E+20)	2.282 ***	1.819 ***	0.911 *
	(0.698)	(0.556)	(0.596)
Number of Observations	66	66	66

VI. Price Effects: Event Study Analysis

	C. Effective Date (t_E)		
Returns on (t_E-12)	-0.024	-0.353	-0.419
	(0.425)	(0.407)	(0.342)
Cumulative Returns between (t_E-12) and (t_E-10)	0.035	0.116	-0.271
	(0.573)	(0.563)	(0.488)
Cumulative Returns between (t_E-12) and (t_E-5)	1.096 **	0.988 *	0.497
	(0.680)	(0.680)	(0.568)
Cumulative Returns between (t_E-12) and (t_E)	4.925 ***	3.509 ***	3.543 ***
	(1.017)	(0.828)	(1.056)
Cumulative Returns between (t_E-12) and (t_E+5)	3.370 ***	2.540 ***	2.129 ***
	(0.956)	(0.831)	(0.790)
Cumulative Returns between (t_E-12) and (t_E+15)	2.835 ***	2.179 **	1.555 *
	(1.142)	(0.913)	(1.209)
Cumulative Returns between (t_E-12) and (t_E+20)	2.038 *	1.755 **	0.707
	(1.311)	(1.020)	(1.248)
Number of Observations	27	27	27

VII. Conclusions

- Benchmark effect significant and quantitatively important for mutual fund allocations, capital flows, prices across countries

- Independent from country fundamentals and other shocks

- It can amplify shocks to fundamental or go against them

- Can lead to counterintuitive movements in capital flows

- Effect arises from intermediation process behind international allocations and capital flows

- Benchmarks can become a coordinating device for these funds

- Consistent with findings in the literature including herding

- Important to explicitly incorporate benchmarks in future studies

- Especially given likely increase in importance of index funds

Thank you!