Do Foreign Investors Improve Market Efficiency?

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Motivation

- Key function of financial markets: efficient allocation of capital to real sector
- Traditionally, performed by local (domestic) investors...
- ...but financial markets are becoming increasingly global
- Institutional investors are a dominant force in global flows

  Foreign institutional ownership:
  - 2.3% (2000) vs 9.6% (2013) for an average U.S. stock
  - 5.3% (2000) vs 18.9% (2013) for an average non-U.S. stock

Question:

Do foreign (institutional) investors improve price efficiency?

Motivation

- In a frictionless market capital flows should improve real efficiency
  - Tobin: prices should be informative about investment quality
  - Bagehot / Schumpeter: intermediaries screen out bad projects
  - Jensen: contracts can incentivize value-maximizing policies
- Financial frictions can hamper efficiency of global financial flows
  - Asymmetric information in local financial markets
  - Regulatory frictions in global markets
  - Global flows dwarfed by domestic flows

Measuring Informational Efficiency

- Price Informativeness estimated as the predicted variation in earnings using prices

$$E_{i,h}/A_i = a + b_{1,h} log(M/A)_i + b_{2,h}(E_i/A_i) + b_{3,h} SIC1 + e_{i,h}$$

where h is earnings horizon of either one or three years

Price Informativeness (PI): $PI_{t+h} = b_{1,h} * \sigma(log(M/A))$

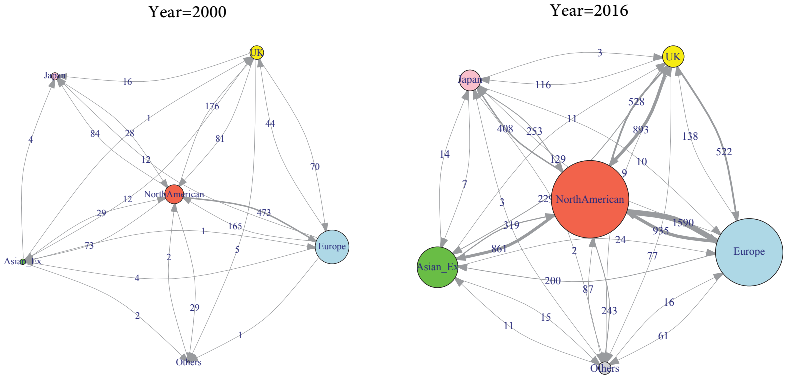
  - Consistent with q-theory (Bai, Philippon, Savov, 2016)
  - Consistent with info theory (Kacperczyk, Nosal, Sundaresan, 2018)

- Alternative efficiency measures provide robust results

Data

- Institutional ownership data from FactSet, covering 40 countries from 1999 to 2013
    - Domestic (*DOM*) vs. foreign (*FOR*)
    - Active (*ACTIVE*) vs. passive (*PASSIVE*)
- Stock market and accounting data from Worldscope
- 23,811 stocks and 186,885 stock-year observations with ownership, market, and accounting data
    - Total ownership (*IO*): 19.5%
    - Developed countries (24.1%) vs. emerging countries (7%)
    - *DOM* vs. *FOR*: 14.9% vs. 4.6%
    - *ACTIVE* vs. *PASSIVE*: 17% vs. 2.5%

Geography of Foreign Fund Flows



Others={South Africa, Australia, New Zealand, Brazil, Chile}

Approach 1: Portfolio Sorts

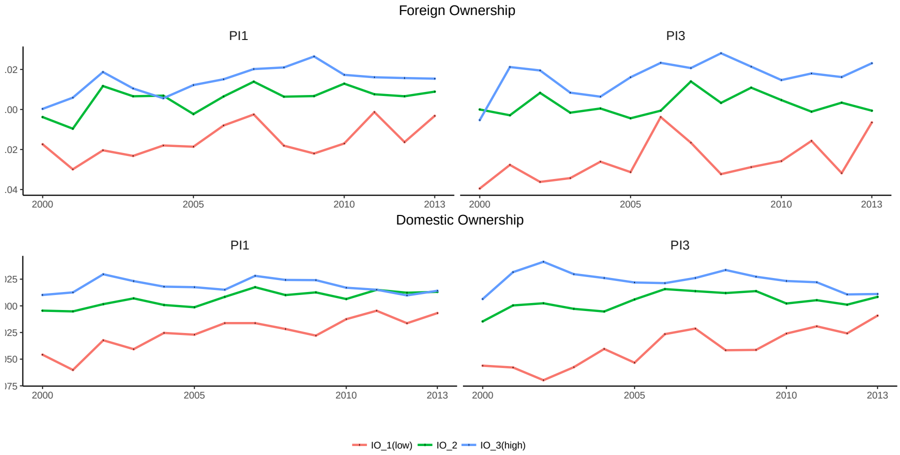
Portfolio sorts (within a year and country):

- Sort by total (IO), domestic (DOM), and foreign (FOR) ownership
- Condition on the origin of flows (developed vs. emerging)
- Double (conditional/unconditional) sort by DOM and FOR to control for multicollinearity in ownership

Estimate PI measures for individual portfolios (aggregated over time)

Price Informativeness: Single Sort

	FOR			DOM		
	FOR	*PI*1	*PI*3	*DOM*	*PI*1	*PI*3
*IO*_0(Zero)	0.00	−5.08	−7.52	0.00	−3.49	−5.30
*IO*_1(Low)	0.19	−1.58	−2.90	1.70	−4.85	−6.76
*IO*_2	0.98	−0.16	−0.98	9.32	−0.64	−1.76
*IO*_3	2.64	0.64	0.27	18.54	0.66	0.17
*IO*_4	6.02	0.91	0.52	27.06	1.17	1.40
*IO*_5(High)	16.62	1.92	1.79	37.35	2.09	2.51
Low-Zero	0.19***	3.50***	4.62***	1.70***	−1.36	−1.45*
	(0.03)	(0.16)	(0.69)	(0.15)	(0.91)	(0.71)
High-Low	16.43***	3.50***	4.69***	35.65***	6.93***	9.26***
	(1.41)	(0.17)	(0.33)	(3.04)	(0.97)	(1.29)


Foreign Ownership
PI1
PI3
2000
2005
2010
2013
Domestic Ownership
PI1
PI3
IO_1(low)
IO_2
IO_3(high)

Price Informativeness: Conditional Sort
Double Sorting

PI **1**

		FOR			
		Low	High	H-L	
DOM	*IO*_1(Low)	−2.21	−0.84	1.38***	(0.21)
	*IO*_2	−1.10	−0.12	0.98***	(0.33)
	*IO*_3	0.47	0.88	0.41	(0.33)
	*IO*_4	0.94	1.62	0.68***	(0.14)
	*IO*_5 (High)	1.64	2.08	0.44	(0.27)
	High-Low	3.85***	2.91***		
		(0.46)	(0.24)		

PI **3**

		FOR			
		Low	High	H-L	
DOM	*IO*_1(Low)	−3.07	−1.49	1.58***	(0.31)
	*IO*_2	−1.90	−0.98	0.92*	(0.49)
	*IO*_3	−0.35	0.78	1.14***	(0.34)
	*IO*_4	1.17	2.52	1.34***	(0.09)
	*IO*_5 (High)	1.96	2.47	0.51	(0.51)
	High-Low	5.03***	3.96***		
		(0.70)	(0.31)		

Approach 2: Multivariate Regression

- Estimate the pooled regression model at the firm/year level

$$E_{i,t+h}/A_{i,t} = a + b_{1,h} log(M/A)_{i,t} + b_{2,h} log(M/A)_{i,t} \times IO_{i,t} + Controls + FixedEffects + e_{i,h}$$

- Adding firm-level controls to rule out potential confounding effects
  - Controls: earnings-to-assets, total assets, insider ownership, book leverage, tangibility, total sales, foreign sales, cash holdings, analyst coverage
- Firm and country $\times$ year fixed effects

Regression Analysis

$N = 186,714$

	$E_{i,t+1}/A_{i,t}$		
$log(M/A)_{i,t}$	0.018***	0.018***	0.009***
	(0.002)	(0.002)	(0.002)
$log(M/A)_{i,t} * IO_{i,t}$	0.082***		
	(0.005)		
$log(M/A)_{i,t} * FOR_{i,t}$		0.105***	0.083***
		(0.013)	(0.011)
$log(M/A)_{i,t} * DOM_{i,t}$		0.077***	0.061***
		(0.005)	(0.004)
	$E_{i,t+3}/A_{i,t}$		
$log(M/A)_{i,t}$	−0.009***	−0.009***	−0.025***
	(0.003)	(0.003)	(0.003)
$log(M/A)_{i,t} * IO_{i,t}$	0.050***		
	(0.008)		
$log(M/A)_{i,t} * FOR_{i,t}$		0.057***	0.054***
		(0.015)	(0.013)
$log(M/A)_{i,t} * DOM_{i,t}$		0.046***	0.038***
		(0.009)	(0.008)
Controls	No	No	Yes

Identification Concerns

- The magnitude of the effect may be biased due to omitted variables
- Fixed effects account for omitted time-invariant characteristics (country, industry, time, and firm level)
- Need to introduce exogenous variation into foreign ownership to account for time-varying omitted variables
- Use exogenous variation in foreign ownership due to stocks' addition to MSCI index
  - Difference-in-differences: Stocks added to MSCI index vs. counterfactual control

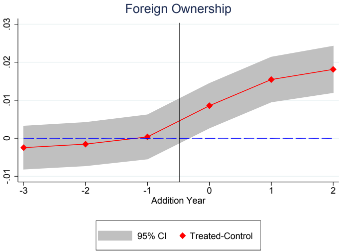
Diff-in-Diff: Pre Selection

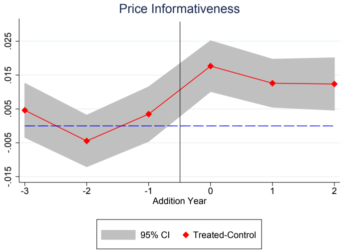
- Treatment group defined as stocks added to MSCI index
- Control group selected using propensity score matching
- Matching performed along the following dimensions:

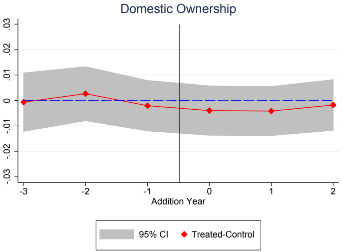
Pre-treatment Comparison

	Treated Group	Control Group	*p-value* (t-test)
FOR	0.085	0.082	0.36
FOR_ACTIVE	0.076	0.071	0.19
FOR_PASSIVE	0.010	0.011	0.15
DOM	0.347	0.354	0.64
$log(M/A)$	0.130	0.084	0.18
$Market\_Cap(\$Bil)$	6.262	5.682	0.16
FORSALES	0.269	0.262	0.59
E/A	0.110	0.107	0.49
$R\&D/A + CAPEX/A$	0.086	0.082	0.22

Diff-in-Diff: Ownership and PI







Diff-in-Diff: Results

Ownership

	FOR	*DOM*	*FOR_ACTIVE*	*FOR_PASSIVE*
$Treat * After$	0.018***	−0.006	0.011***	0.007***
	(0.002)	(0.004)	(0.001)	(0.001)

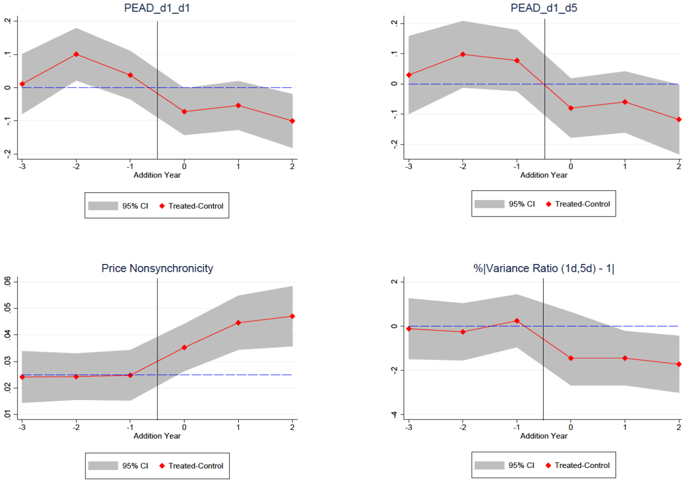
Price Informativeness

	$E_{i,t+1}/A_{i,t}$	$CAPEX_{i,t+1}/A_{i,t}$	$R\&D_{i,t+1}/A_{i,t}$
$log(M/A) * Treat * After$	0.013**	0.003**	0.001
	(0.006)	(0.0016)	(0.001)

Alternative PI Measures

- Post-Earnings-Announcement Drift (Bernard and Thomas, 1989)
- Price Nonsynchronicity (Roll, 1988)
- Variance Ratio (Campbell, Lo, MacKinley, 1998)

Diff-in-Diff: Alternative PI Measures



Diff-in-Diff: Regressions

Post-Earnings-Announcement Drift

	CAR_d1_d1	CAR_d1_d3	CAR_d1_d5
SUE	0.341***	0.412***	0.433***
	(0.021)	(0.024)	(0.025)
$SUE * Treat * After$	−0.120***	−0.115**	−0.161***
	(0.045)	(0.052)	(0.057)

Price Nonsynchronicity and Variance Ratio

	Price Nonsynchronicity	$\lvert VR-1\rvert(\%)$
$Treat * After$	0.033***	−0.971*
	(0.010)	(0.573)
Observations	21,722	21,440
R^2	0.345	0.191

Economic Mechanism: Info vs. Governance

- Do managers benefit (informationally) from the presence of foreign investors?
  - Firm information disclosure vs. real efficiency gain
  - Real (aggregate) efficiency defined as the predictability of earnings using investments
- Do markets produce more information to cater to foreign investors?
- Do foreign investors improve risk sharing?
  - Look at cost of equity, beta, and idiosyncratic volatility
- Do foreign investors improve liquidity?
  - Look at turnover and bid-ask spread
- Do foreign investors improve firm governance?

Diff-in-Diff: Economic Mechanism

Panel A: Aggregate Efficiency

	$E_{i,t+1}/A_{i,t}$	$E_{i,t+3}/A_{i,t}$
$CAPEX_{i,t}/A_{i,t} * Treat * After$	0.134***	0.059
	(0.046)	(0.123)
Observations	20,418	6,716
R^2	0.685	0.654
$R\&D_{i,t}/A_{i,t} * Treat * After$	−0.073	0.664*
	(0.080)	(0.401)
Observations	20,418	6,716
R^2	0.681	0.647

Panel B: Volatility, Beta, and ICOE

	Idio Vol	Beta	ICOE
$Treat * After$	−0.142	−0.039	−0.011***
	(0.206)	(0.059)	(0.003)
Observations	21,722	21,722	17,268
R^2	0.542	0.553	0.582

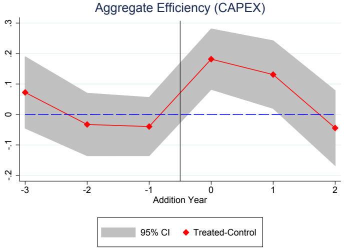
Panel C: Liquidity and Analyst Coverage

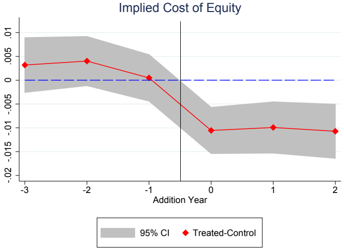
	Turnover	Bid-Ask	Analyst
$Treat * After$	0.201***	−0.036***	2.959***
	(0.044)	(0.007)	(0.302)
Observations	22,790	16,820	24,230
R^2	0.745	0.760	0.912

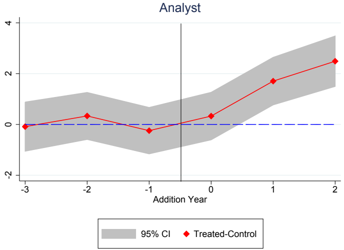
Panel D: Governance Index

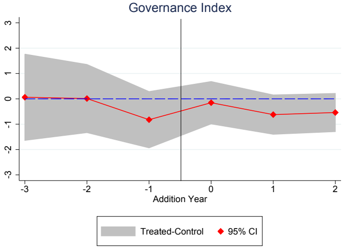
$Treat * After$	−0.009
	(0.007)
Observations	7,784
R^2	0.835

Diff-in-Diff: Economic Mechanism 2









Boundary Conditions

Does investors' activeness matter?

1. Activeness of foreign institutional investors
   - Institutional type, holding period, U.S. investors

Does asymmetric information matter?

2. Familiarity bias: foreign investors choose to invest into countries with strong familiarity
3. Knowledge spillover: higher $\rightarrow$ lower financial development

Home country environment and economic conditions

4. Capital controls: effects stronger with weaker capital controls
5. Economic conditions: effects stronger in bad market conditions

Conclusion

- The rising institutional ownership contributes to the increasing price informativeness
  - Foreign ownership is much more important than domestic ownership for non-U.S. stocks

- Quasi-experiment based on stocks added into MSCI index addresses the endogeneity problem

- Underlying economic mechanism more in line with better information production than with better governance

- The data are consistent with limits of economic theory