Tilting with the Tide

Portfolio Allocation under Water Scarcity

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Abstract Investors typically overweight domestic equities, reflecting a persistent home bias. But what happens when these preference generate local economic costs? I study firms that exacerbate scarcity of a vital, non-substitutable resource—water. Here, domestic investors face a trade-off: maintain home-biased allocations or reduce investments to limit the negative local externalities of scarcity. I show that institutional holdings are negatively associated with water scarcity. Domestic investors' holdings are more strongly associated with scarcity at home than abroad, while the opposite is true for foreign investors. These patterns indicate that investors' proximity to scarcity is reflected in portfolio allocation and support the idea that institutional investors tilt away from firms that exacerbate local water scarcity. Local scarcity risks can reverse the traditional home bias, demonstrating how increasing resource pressures may shape global investment patterns.

Keywords: portfolio allocation, institutional investors, water scarcity

JEL classification: G11, G23, G40, Q25

1. Introduction

Standard portfolio theory dictates that investors should diversify globally and focus only on firms' exposures to systematic risk factors. In practice, however, investors exhibit a persistent home bias, overweighting domestic equities (French and Poterba, 1991; Karolyi and Stulz, 2003; Lewis, 1999). Proposed mechanisms include informational advantages by local investors (Boermans and Galema, 2025; Chaieb, Errunza, and Lu, 2024; Van Nieuwerburgh and Veldkamp, 2009), familiarity (Chan, Covrig, and Ng, 2005), or more effective monitoring and engagement (Dasgupta, Huynh, and Xia, 2023) While these mechanisms help explain why investors might overallocate to their home economy, they abstract from the negative externalities that such overallocation can impose on the broader domestic economy. This raises a tension: does the home bias persist when domestic firms receiving disproportionate investment generate economic costs for the local economy?

In this paper, I study whether the home bias holds for firms that overconsume an economically vital resource at home: water. Water is a common, non-substitutable resource on which all firms depend. Overconsumption by one firm can generate direct negative externalities for others, limiting access, increasing costs, and potentially reducing output across the local economy. Domestic investors therefore face a trade-off: maintain home-biased overallocation to these firms, or redirect capital to preserve a resource crucial to local economic productivity. Because water availability varies continuously—from abundance to extreme scarcity—the economic pressures of (over)consumption also vary. This variation provides a natural setting to examine the conditions under which the home bias persists, attenuates, or even reverses.

I find that firm exposure to water scarcity — whether measured by firms' water demand, local water supply, or local water stress (the interaction of supply and demand) — is associated with lower institutional ownership . Both domestic and foreign investors show evidence of tilting away from water scarcity, but they seemingly respond to scarcity in different geographic locations. Domestic holdings are negatively associated almost exclusively with water scarcity at the firm's headquarters, typically located in the firms' and therefore domestic investors' home country. Foreign investors, by contrast, show almost no association with the headquarters; their holdings are more strongly associated with water scarcity at production locations, while those of domestic investors typically are not. These patterns support the idea that institutional investors tilt away from firms exacerbating water scarcity at home.

I contribute to a recent literature that examines the persistence and limits of the home bias in the presence of local risks. Bolton, Eskildsen, and Kacperczyk (2024) and Boermans and Galema (2025) document a persistent "carbon home bias," whereby domestic investors overweight high-emitting firms despite rising transition risks. Other studies show that local investors rebalance away from firms exposed to nearby environmental or social shocks – such as regulatory enforcement actions

(Dasgupta et al., 2023), natural disasters (Alok, Kumar, and Wermers, 2020)[1], or harmful ESG events (Gerasimova and Rohrer, 2023). At the same time, high-ESG firms tend to be overweighted by domestic investors, a pattern Chaieb et al. (2024) refer to as "ESG home bias." The evidence implies that while the home bias typically persists, local risks can occasionally overturn it.

2. Data

I study the period 2005-2022. I collect firm-level institutional ownership data from Factset, water use data from S&P Global Trucost Environmental, firm headquarter and asset locations from S&P Global Trucost Physical Risk, local water levels data from NASA and stock price and accounting data from CRSP and Compustat.

2.1. Institutional investor portfolios

I obtain quarterly firm-level institutional ownership data from FactSet Stock Ownership (Ferreira and Matos, 2008), which reports equity holdings for publicly listed firms headquartered in developed and emerging markets included in the MSCI ACWI, as well as Luxembourg. Institutional ownership is defined as the share of a firm's market capitalization held by institutional investors; domestic institutional ownership denotes the share held by investors domiciled in the country of listing, while foreign institutional ownership refers to the share held by investors domiciled elsewhere. I construct two additional measures: the difference between domestic and foreign ownership (Domestic - Foreign) and the ratio of domestic to total institutional ownership (Domestic / Total).

I restrict the sample to non-financial publicly listed firms for which the necessary accounting controls are available and for which at least one water measure (water use or local water levels) is observed. The resulting dataset contains 252,273 firm-quarter observations (6,862 unique firms). The sample spans 42 countries and regions, with 37% of firms listed in the United States, followed by Japan (15%), Canada, Australia, Great Britain, China, and Hong Kong (each 4–6%), and Germany, France, and Sweden (around 2% each), with the remaining countries contributing smaller shares.

Figure A.1 reports institutional ownership by country or region and shows the composition of domestic versus foreign investors. In the United States, ownership is heavily skewed toward domestic investors, whereas in Ireland, foreign investors hold nearly all shares. Great Britain, Sweden, Poland, and India are more oriented toward domestic ownership, while in the remaining countries shares are predominantly held by foreign investors. Cross-country differences in investor composition may shape the extent to which water-stressed firms are held, since domestic and foreign investors may have different incentives regarding the governance of water as a local resource.

[1]Local underinvesting following natural disasters is attributed to a salience bias, first introduced by Tversky and Kahneman (1973) as "availability heuristic".

2.2. Firm-level water use

I obtain annual firm-level water use data from S&P Global Trucost Environmental as a proxy for corporate water demand. Water use is measured in three ways: *Direct Water Use*, capturing water consumed in the firm's own operations; *Total Water Use*, which includes both direct use and upstream supply chain consumption; and *Indirect Water Use*, computed as the difference between total and direct use to isolate supply chain water consumption. All three are reported in cubic meters (m^3) and log-transformed for analysis. *Total Water Use Intensity*, *Direct Water Use Intensity*, and *Indirect Water Use Intensity* represent water use by firm revenue in $ millions. To account for the lag between fiscal quarter-end and the publication of annual reports, all water use variables are lagged by six months.

2.3. Water levels

I use fluctuations in water levels at firm locations as a proxy for local water supply. I obtain firm headquarter and asset location data from S&P Global Physical Risk. This dataset holds the latitude and longitude of 5,744 headquarter locations and 804,833 asset locations across the globe. Figure A.2 and A.3 show the global distribution of headquarters and asset locations respectively. I use asset locations as proxied for production locations. To measure water level fluctuations at these locations, I rely on satellite observations from the NASA Gravity Recovery and Climate Experiment (GRACE) and its successor, the GRACE Follow-On (GRACE-FO) missions, to capture granular spatiotemporal measures of terrestrial water availability. These missions provide monthly anomalies in land water mass at a spatial resolution of 1°× 1° across the globe. The anomalies are monthly deviations from the location-specific average and thus represents - once corrected for seasonal patterns - abnormalities in water levels. The dataset encompasses all forms of terrestrial water storage, including surface water in rivers, lakes, and reservoirs, as well as subsurface water in aquifers, groundwater, and soil moisture, thereby capturing the full range of water resources relevant for industrial and agricultural production. GRACE provides coverage from April 2002 through October 2017, while GRACE-FO extends the record from 2018 to the present. I match the S&P headquarter and asset locations to the NASA gridpoints using nearest-neighbour matching on latitude and longitude. Figure A.4 shows the NASA gridpoints to which the firm locations are matched. Firm-level exposure to water level fluctuations is determined as the average exposure across its locations. The water levels data are lagged by two months to account for the a 40-60 days publication delay.

2.4. Water stress

Firm-level water demand and local water supply do not, on their own, identify exposure to water stress. A firm with high water demand may face little stress if it operates in an area with abundant

supply, while a firm in a low-supply area may not be exposed if its demand is minimal. A comprehensive measure of water scarcity risk therefore combines both corporate water demand and local water supply to capture a firm's effective exposure to water stress – the state at which supply may no longer be able to meet demand.

To construct such a measure, I rely on water level fluctuations at the firms' headquarter and asset locations as a proxy for local water supply, and on *direct* water use – the volume of water consumed in the firm's own operation – as a proxy for water demand. Total water use, which includes upstream supply chain consumption, cannot be reliably matched to firms' local water supply, as suppliers may operate in regions with very different water conditions. Including upstream use would introduce measurement noise. Firm-level water stress is thus defined as the interaction of direct water use with changes in local water levels.

2.5. Accounting data and stock returns

I collect stock price and accounting data for all firms with available water use or locations data, comprising a total of 12,337 unique firms. For U.S. firms, stock price data are collected from CRSP. For non-U.S. firms, stock price data are collected from Compustat Global and Compustat North America. I retain only common equities and exclude investment vehicles, funds and trusts, and other financial firms. The risk-free rate is proxied by the one-month Treasury bill rate from the Kenneth French website. Stock prices are used to compute *Volatility*, *Beta*, and *Momentum* *Volatility* of stock i at the end of month t is defined as the standard deviation of the monthly stock returns in U.S. dollars over the preceding 12 months, excluding $t-1$. *Momentum* of stock i at the end of month t is defined as the cumulative stock return in U.S. dollars over the preceding 12 months, excluding $t-1$, also requiring at least nine months of available returns. *Beta* is the market beta calculated over the past 24 months. Quarterly accounting data are obtained from Compustat Global and Compustat North America. *Ln. Firm Size* is the natural logarithm of market capitalization in $ millions; *Investments/Assets* is the ratio of change in capital expenditures to total assets; *Leverage* is the ratio of total debt to total assets; *Book-to-Market* is the ratio of book value of equity to market value of equity; *Return on Equity* is the ratio of net income to market value of equity. All control variables, except Ln. Firm Size, are winsorized at the 1.0% level. Following Fama and French (1992), I assume a conservative six-month delay between the fiscal period end and the public availability of quarterly accounting information. The final sample comprises 235,375 institutional investor portfolios, 6,848 unique firms

2.6. Summary statistics

Table 1 reports summary statistics for the variables used in the regressions. Panel A shows statistics for institutional ownership: the average (median) firm has 41% (28%) of its equity held by insti-

Table 1: Summary Statistics - Firm-Level

This table reports summary statistics for the variables used in the firm-level regressions. **Panel A** reports statistics on quarterly firm-level institutional holdings from FactSet Ownership. *Institutional Ownership*, and *Domestic* and *Foreign Institutional Ownership* report total, domestic and foreign institutional ownership as a percentage of market capitalization. *Dom./Tot Institutional Ownership* the ratio of domestic to total institutional ownership. **Panel B** reports yearly firm-level measures on water use, monthly aggregated measures of changes in local water levels, and the constructed water stress metric. *Ln. Total, Direct,* and *Indirect Water Use* are the natural logarithms of total, direct and indirect water use in m^3. *Total, Direct,* and *Indirect Water Use Intensity* measure the respective water use measures per $1 million in revenue. Δ *Water Levels Total* is an equal-weighted average of seasonally-adjusted changes in water levels at the firm's headquarter and its global assets. Δ *Water Level HQ* and Δ *Water Levels Assets* are equal-weighted averages of seasonally-adjusted changes in water levels at the firm's headquarters and global assets respectively. *Water Stress HQ* and *Water Stress Assets* report the interaction terms of *Ln. Direct Water Use* and *Water Levels HQ* and *Water Levels Assets* respectively, multiplied by -1 for interpretability. **Panel C** reports the control variables, constructed using data from Compustat and CRSP. *Ln. Firm Size* is the natural logarithm of market capitalization in $ millions; *Investments/Assets* is the ratio of change in capital expenditures to total assets; *Leverage* is the ratio of total debt to total assets; *Book-to-Market* is the ratio of book value of equity to market value of equity; *Return on Equity* is the ratio of net income to market value of equity; *Volatility*; is the standard deviation of monthly stock returns over the preceding 12 months, excluding t-1 *Beta*; is the market beta calculated over the past 24 months; *Momentum* is the cumulative stock return over the preceding 12 months, excluding t-1. All control variables (except *Ln. Firm Size*) are winsorized at 1.0%

Panel A: Institutional Holdings								
Variable	obs	mean	sd	min	p25	median	p75	max
Inst. Ownership	234,155	40.759	33.080	0.000	12.650	28.312	71.954	100.000
Domestic Inst. Ownership	234,155	30.555	33.711	0.000	2.691	10.542	63.578	99.895
Foreign Inst. Ownership	234,155	10.204	10.372	0.000	2.880	7.510	14.180	100.000
Dom./Tot. Inst. Ownership	234,150	55.900	36.209	0.000	21.535	58.262	92.703	100.000
Panel B: Water Use Variables								
Ln. Total Water Use	139,090	17.588	2.421	2.974	16.222	17.708	19.126	25.027
Ln. Direct Water Use	138,981	14.419	3.024	-0.947	12.637	14.395	16.086	25.016
Ln. Indirect Water Use	139,090	17.332	2.281	2.954	16.077	17.524	18.803	24.733
Total Water Use Intensity	139,090	48,717	99,999	4,683	12,130	19,018	33,750	551,384
Direct Water Use Intensity	139,090	17,952	73,375	27.947	276.620	689.529	2,622	428,220
Indirect Water Use Intensity	139,090	25,002	28,570	4,486	10,133	16,087	25,556	154,427
Δ Water Levels Total	208,503	-0.000	0.060	-0.725	-0.027	0.001	0.031	0.329
Δ Water Levels HQ	208,502	-0.001	0.061	-0.680	-0.029	0.000	0.033	0.335
Δ Water Levels Assets	40,809	-0.003	0.066	-1.411	-0.022	0.001	0.025	0.255
Water Stress HQ	105,547	-0.010	0.958	-6.612	-0.509	-0.013	0.440	11.851
Water Stress Assets	23,399	0.009	0.979	-4.218	-0.413	-0.020	0.342	22.200
Panel C: Control Variables								
Ln. Size	231,840	7.181	1.648	1.610	6.132	7.118	8.251	13.554
Investments/Assets	221,542	0.012	0.013	-0.000	0.003	0.008	0.015	0.075
Leverage	223,880	0.229	0.188	0.000	0.065	0.206	0.344	0.838
Book-to-Market	223,140	0.885	0.928	0.012	0.314	0.619	1.108	5.746
Return on Equity	223,807	0.013	0.048	-0.205	0.000	0.009	0.024	0.218
Volatility	228,773	0.114	0.068	0.032	0.068	0.095	0.138	0.412
Beta	228,614	1.170	0.824	-0.676	0.632	1.083	1.595	4.057
Momentum	229,349	0.130	0.517	-0.754	-0.169	0.053	0.306	2.574

tutional investors, with domestic investors accounting for the majority of these holdings. Panel B summarizes the statistics on the three measures of water scarcity risk: firm-level water use, which proxies for water demand, changes in water levels, which proxies for local water supply, and water stress, defined as their interaction. The average firm uses almost 43.5 billion liters of water and appears, on average, to face only modest local water declines. However, local water levels show a pronounced left skew, with large decreases more common than increases, indicating exposure to potentially severe local water level reductions. Panel C reports standard firm-level control variables after winsorization. The variation in institutional ownership and firms' exposure to water scarcity risks forms the foundation of the empirical analysis.

3. Results

In this section, I present regressions of institutional ownership on three measures of water scarcity: firms' water demand, changes in local water supply, and local water stress. All three measures are negatively associated with institutional ownership, indicating that investors may tilt their portfolios away from firms facing — and potentially exacerbating — local water scarcity. Domestic investors' holdings are strongly and almost exclusively associated with water scarcity at the headquarters, with no notable association abroad. Conversely, foreign investors' holdings are associated with water scarcity likely to occur outside the firm's home country but typically not at the headquarters. These patterns suggest that institutional portfolio allocation is related to whether scarcity risks arise in the investor's home country or abroad.

3.1. Water scarcity and aggregate institutional ownership

Table 2 reports regressions of institutional ownership on the first measure of water scarcity risk: firm water demand. Water demand is proxied by six measures: three capturing water use and three capturing water use intensity. Columns 1–2 present results for *Total Water Use*, capturing overall firm water consumption, while columns 3–4 show a joint specification of *Direct Water Use*, reflecting water used in the firm's operations, and *Indirect Water Use*, capturing water used in the upstream supply chain. While total water use is positively associated with institutional ownership, the joint specification indicates that this association is driven by indirect water use. Direct water use by the firm itself is negatively associated with institutional ownership: a one-standard-deviation increase corresponds to a 1.80 percentage point reduction in institutional ownership, or 4.40% relative to the mean firm. This effect loses significance once industry fixed effects are included, suggesting it is largely determined at the industry level.

Columns 5–6 report results for *Total Water Use Intensity* — the extent to which firms rely on water to generate revenue — while columns 7–8 show the joint specification of *Direct* and *Indirect Water Use Intensity*. Water use intensity does not appear to be associated with institutional own-

Table 2: Institutional Ownership and Water Use

This table reports the results of the regressions of institutional ownership on *Total Water Use*, *Direct Water Use*, *Indirect Water Use*, *Total Water Use Intensity*, *Direct Water Use Intensity*, and *Indirect Water Use Intensity*, all lagged by six months. Variable definitions are provided in Table 1. Regressions include country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Institutional Ownership	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln. Total Water Use	0.3508*	1.3167***						
	(1.7579)	(5.4283)						
Ln. Direct Water Use			-0.5945***	-0.1132				
			(-5.2575)	(-0.8231)				
Ln. Indirect Water Use			1.4592***	1.6198***				
			(6.9300)	(5.1745)				
Total Water Use Intensity					-0.0000***	-0.0000		
					(-7.2734)	(-0.0995)		
Direct Water Use Intensity							-0.0000***	-0.0000
							(-7.2691)	(-0.5347)
Indirect Water Use Intensity							-0.0000*	-0.0000
							(-1.7109)	(-0.3150)
Ln. Size	1.1177***	0.9134***	0.6671**	0.7312**	1.4870***	2.1249***	1.5095***	2.1254***
	(4.2590)	(3.2962)	(2.5154)	(2.5513)	(5.8595)	(8.4298)	(5.9469)	(8.4320)
Investments/Assets	-58.6989***	17.9891	-48.7268***	17.2350	-46.0952**	13.8118	-45.1576**	13.8709
	(-3.2299)	(0.9990)	(-2.7050)	(0.9613)	(-2.5495)	(0.7741)	(-2.5052)	(0.7758)
Leverage	-2.1691	2.0007	-1.9464	1.8786	0.0802	4.3425***	0.2721	4.3845***
	(-1.5237)	(1.4174)	(-1.3811)	(1.3344)	(0.0542)	(2.8974)	(0.1834)	(2.9259)
Book-to-Market	-0.1834	0.1057	-0.2610	0.0415	0.3960	0.9562**	0.4302	0.9634***
	(-0.5464)	(0.3086)	(-0.7888)	(0.1214)	(1.1241)	(2.6313)	(1.2165)	(2.6529)
Return on Equity	9.0672***	0.0074	5.3320*	-0.6622	8.5652***	2.6631	8.1397**	2.6249
	(2.8693)	(0.0023)	(1.7078)	(-0.2057)	(2.7793)	(0.8394)	(2.6323)	(0.8270)
Volatility	-56.2108***	-53.6865***	-52.8149***	-52.9891***	-59.5317***	-59.2070***	-59.4007***	-59.2260***
	(-11.1765)	(-11.8675)	(-10.7376)	(-11.9244)	(-11.0060)	(-11.4060)	(-10.9951)	(-11.4098)
Beta	1.9041***	0.7376**	1.5648***	0.7103**	1.5971***	0.8949***	1.5873***	0.8933***
	(5.8380)	(2.5499)	(5.0249)	(2.4775)	(4.9709)	(2.9511)	(4.9558)	(2.9466)
Momentum	2.0216***	1.9871***	2.0182***	1.9761***	2.0148***	1.9374***	2.0189***	1.9366***
	(5.6659)	(5.2176)	(5.8112)	(5.2781)	(5.6621)	(4.8377)	(5.6968)	(4.8421)
Constant	35.2729***	18.8266***	28.1811***	17.0181***	38.9296***	31.7958***	38.5892***	31.9156***
	(10.4658)	(4.9435)	(8.5209)	(4.1952)	(17.4985)	(14.0354)	(17.2231)	(13.9624)
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	124,307	124,221	124,237	124,151	124,307	124,221	124,307	124,221
R-squared	0.7848	0.8074	0.7877	0.8077	0.7869	0.8054	0.7872	0.8054

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

ership. Together with the results on water use, this suggests that institutional investors respond more to the total amount of water used than to a firm's direct reliance on water for revenue generation. These patterns are broadly consistent with investors allocating capital based on firms' overall extraction of water and impact on the local water supply rather than their financial sensitivity to scarcity. The results are robust to alternative lag structures; estimates using three- and nine-month lags of water use are reported in Tables A.1 and A.2 in the appendix.

Table 3 reports regressions of institutional ownership on the second measure of water scarcity risk: firm exposure to changes in local water supply. Water supply is proxied by three measures, capturing total water level changes (columns 1–2), as well as changes at headquarters and asset locations (columns 3–4). Water level changes are positively associated with institutional ownership, with the joint specification indicating that headquarters locations drive the effect. A one-meter

Table 3: Institutional Ownership and Δ Water Levels

This table reports the results of the regressions of institutional ownership on Δ*Water Levels Total*, Δ*Water Levels HQ* and Δ*Water Levels Assets*, all lagged by two months to account for a 40-60 reporting lag. *Rise* and *Fall* capture increases and decreases in water levels respectively. Other variable definitions are provided in Table 1. Regressions include country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Institutional Ownership	(1)	(2)	(3)	(4)	(5)	(6)
Δ Water Levels Total	7.1608**	7.8717**				
	(2.0316)	(2.2939)				
Δ Water Levels HQ			38.2096***	39.1575***		
			(4.3356)	(4.2474)		
Δ Water Levels Assets			5.3549	4.7152		
			(1.2907)	(1.1714)		
Δ Water Levels HQ - Rise					33.5390**	34.6834**
					(2.4968)	(2.5197)
Δ Water Levels HQ - Fall					42.3503***	42.4334***
					(3.3291)	(3.4011)
Δ Water Levels Assets - Rise					6.8946	11.7846
					(0.5081)	(0.8900)
Δ Water Levels Assets - Fall					4.9946	2.9625
					(1.2072)	(0.7069)
Ln. Size	3.4860***	4.0782***	3.5408***	3.9085***	3.5445***	3.9211***
	(17.6106)	(20.3852)	(9.3022)	(9.7971)	(9.3280)	(9.8423)
Investments/Assets	-26.2096*	40.0760***	25.0353	45.8368**	24.8803	45.4605**
	(-1.7503)	(2.8243)	(1.1095)	(2.1152)	(1.1036)	(2.1061)
Leverage	1.5812	6.3180***	3.8921	10.8721***	3.9151	10.9171***
	(1.1288)	(4.6321)	(1.2666)	(3.2620)	(1.2699)	(3.2709)
Book-to-Market	1.9180***	2.9714***	1.0599**	1.3233***	1.0649**	1.3325***
	(6.6812)	(9.9596)	(2.2377)	(2.7439)	(2.2431)	(2.7604)
Return on Equity	7.3726**	0.9426	8.3948*	3.7767	8.3743*	3.7281
	(2.4507)	(0.3264)	(1.9122)	(0.8992)	(1.9063)	(0.8858)
Volatility	-76.6481***	-76.3433***	-45.0894***	-46.1283***	-45.0886***	-46.0278***
	(-18.6892)	(-19.8142)	(-6.2411)	(-6.4531)	(-6.2427)	(-6.4412)
Beta	3.0417***	2.1496***	1.1200**	0.0507	1.1217**	0.0478
	(10.2525)	(8.1929)	(2.2329)	(0.1049)	(2.2394)	(0.0989)
Momentum	2.9067***	3.0085***	1.7360***	1.6388***	1.7346***	1.6380***
	(9.6818)	(8.9775)	(3.4307)	(2.9683)	(3.4319)	(2.9678)
Constant	20.3060***	14.3745***	6.3840*	2.2122	6.4769*	2.0818
	(11.5403)	(8.0893)	(1.8169)	(0.6235)	(1.8207)	(0.5797)
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	190,406	190,371	34,401	33,833	34,401	33,833
R-squared	0.6983	0.7230	0.7368	0.7654	0.7368	0.7655

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

change in Δ*Water Levels HQ* is associated with a change in institutional ownership of 38.21–39.16 percentage points. A one-standard-deviation change corresponds to a 2.33–2.38 percentage point change in institutional ownership, or 5.72–5.84% relative to the mean firm. Columns 5–6 decompose water level changes into declines and increases. Declines in water levels are associated with a larger reduction in institutional ownership than the increase associated with rising water

levels, indicating a bidirectional but asymmetric relation. Overall, the results are consistent with institutional investors reducing holdings in relatively water-scarce locations and increasing holdings in relatively water-abundant areas.

The association between changes in water levels and institutional ownership is stable across time horizons. Appendix Table A.3 reports regressions using rolling averages of water level changes over horizons ranging from three months to fifteen years. Figure 1 visualizes these estimates for headquarter locations, which drive the effect. For each horizon, the left y-axis shows the change in institutional ownership associated with a unit change in water levels, with slopes left of the origin representing declines and slopes right representing increases. Across all horizons, declines in water levels are associated with reductions in institutional ownership, whereas increases correspond to higher ownership. The slope for declines is consistently steeper, indicating a stronger economic effect. Declines remain statistically significant across all horizons, while the effect of increases weakens and becomes insignificant at longer horizons.

The right y-axis shows the effect of a one-standard-deviation change in water levels, which remains constant around 2.5 percentage points. The invariance of the effect across horizons is consistent with investors responding to persistent, long-term declines in water levels rather than short-term fluctuations. If their responses reflected transitory shocks, the effect would attenuate over longer horizons, which it does not. Long-horizon averages provide a clearer measure of water scarcity, capturing gradual depletion of local resources such as rivers and groundwater. Short-horizon averages, though noisier due to temporary fluctuations such as weather events, still contain information about these underlying long-term trends. Overall, the asymmetric and persistent association suggests that institutional investors view water scarcity as a sustained downside risk rather than a transitory shock, and adjust their portfolio allocations accordingly.

Table 4 presents the results of regressions of institutional ownership on the third measure of water scarcity risk: firm exposure to local water stress. Water stress at headquarters locations is proxied by the interaction of *Ln. Direct Water Use* and Δ *Water Levels HQ*, while water stress at asset locations is proxied by the interaction of *Ln. Direct Water Use* and Δ *Water Levels Assets*[2]. The table present results using different rolling averages for water levels, as in Table A.3.

The coefficient on *Ln. Direct Water Use* captures its association with institutional ownership when water levels are stable (i.e., when Δ *Water Levels*=0). Under stable water supply conditions, firm water use is not associated with institutional ownership, suggesting that investors do not tilt portfolios based on water use alone. The coefficient on *Water Stress HQ* captures the marginal effect of changes in water levels at the headquarters for a given level of water use. Increases in *Water Stress HQ* — arising from declines in water levels holding water use fixed — are associated

[2]Negative values for Δ Water Levels indicate below-average local water levels, so the raw interaction is inversely related to stress. To make the measure more intuitive, I multiply the interaction by –1, so that higher values correspond to greater water stress.

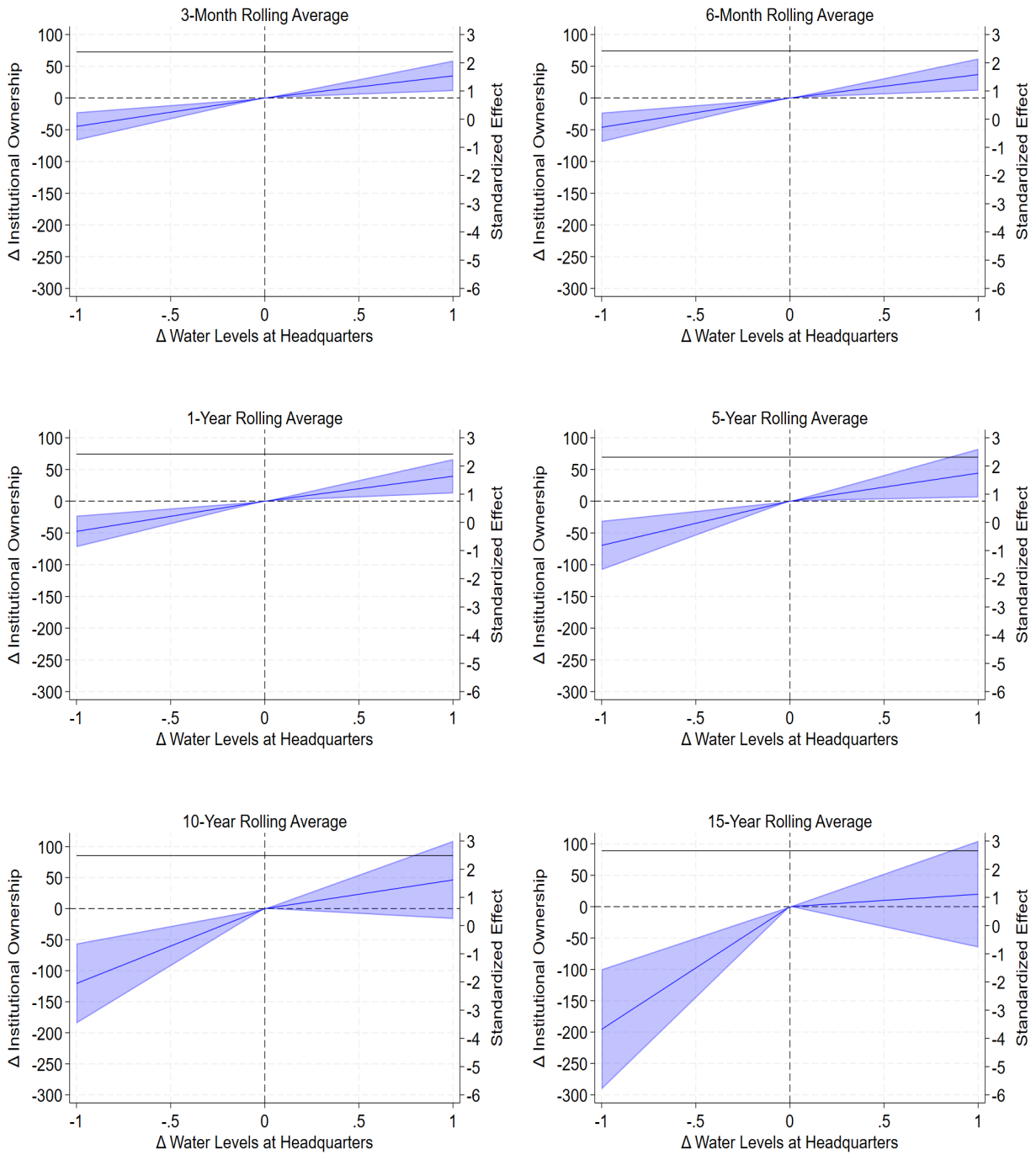


Figure 1: Institutional Ownership and Δ Water Levels HQ

This figure plots coefficients (with 90% confidence intervals) from regressions of institutional ownership on changes in water levels at firm headquarters, using rolling averages over horizons ranging from three months to fifteen years. For each horizon, the left y-axis shows the change in institutional ownership associated with a one-unit change in water levels, separately for declines (left of the origin) and increases (right of the origin). The right y-axis reports the effect of a one-standard-deviation change in total water levels.

Table 4: Institutional Ownership and Water Stress

This table reports the results of the regressions of institutional ownership on water stress, constructed as the interaction of the six-months lagged *Ln. Direct Water Use* and Δ*Water Levels HQ* and Δ*Water Levels Assets* respectively, using rolling averages. Variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Institutional Ownership	3 Months	3 Months	6 Months	6 Months	1 Year	1 Year
Water Stress HQ	-0.9605**	-0.8868*	-0.9908**	-0.9117*	-1.0239**	-0.9380*
	(-2.2173)	(-1.9665)	(-2.1900)	(-1.9375)	(-2.1393)	(-1.8875)
Water Stress Assets	-0.5072	-0.4355	-0.5333	-0.4517	-0.5711	-0.4846
	(-1.1067)	(-0.8758)	(-1.1489)	(-0.8929)	(-1.2106)	(-0.9396)
Ln. Direct Water Use	0.0326	0.2319	0.0319	0.2311	0.0317	0.2306
	(0.1634)	(0.9909)	(0.1601)	(0.9877)	(0.1592)	(0.9861)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	20,915	20,426	20,915	20,426	20,915	20,426
R-squared	0.8177	0.8469	0.8177	0.8469	0.8177	0.8469
	5 Years	5 Years	10 Years	10 Years	15 Years	15 Years
Water Stress HQ	-1.4399**	-1.3281*	-2.1217**	-2.0626*	-2.5158	-2.6493
	(-2.2225)	(-1.9747)	(-2.0957)	(-1.9378)	(-1.7878)	(-1.7653)
Water Stress Assets	-0.9221*	-0.8032	-1.2692*	-1.1646	-1.8704*	-1.6845
	(-1.7687)	(-1.4002)	(-1.7859)	(-1.5238)	(-1.9783)	(-1.6587)
Ln. Direct Water Use	0.0444	0.2211	0.1193	0.2122	0.3457	0.3455
	(0.2247)	(0.9565)	(0.5846)	(0.8640)	(1.5569)	(1.2973)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	20,126	19,702	14,807	14,564	6,539	6,449
R-squared	0.8169	0.8456	0.8098	0.8352	0.7935	0.8174

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

with lower institutional ownership. Using three-month moving averages, a one-meter decline in headquarters-level water levels for a given amount of water use is associated with a 0.89–0.96 percentage point reduction in institutional ownership, corresponding to a 2.18–2.36% decline for the mean firm. While the raw coefficient becomes more negative with longer rolling windows, the implied one-standard-deviation effect remains stable at approximately 0.80–0.90 percentage points. This pattern suggests that capital allocation to firms that use large quantities of water depends on the local water conditions they face: firms operating in areas where water supply may not meet water demand appear to receive less institutional investment. The horizon invariance of the effect suggests that, as in Figure 1, investors respond primarily to long-run developments rather than

short-run fluctuations.

The baseline regressions relate institutional ownership to three measures of water scarcity exposure: firm water use as a proxy for water demand, local water levels as a proxy for water supply, and water stress defined as the interaction of demand and supply. Across all specifications, these measures show a consistently negative association with institutional ownership. Institutional investors appear to allocate less capital to firms with greater exposure to water scarcity risk in the aggregate.

3.2. Water scarcity and domestic vs. foreign institutional ownership

Next, I examine whether domestic and foreign investors respond differently to water scarcity. Domestic investors are those domiciled in the firm's country of listing; foreign investors are all others. Domestic investors may have stronger incentives to reduce holdings to limit negative externalities on the local economy. I test whether domestic ownership declines more than foreign ownership when firms face water scarcity, providing evidence on how proximity to resource constraints can affect institutional portfolios.

Table 5 reports regressions of institutional ownership on *Ln. Total, Direct*, and *Indirect Water Use*, as well as *Total, Direct* and *Indirect Water Use Intensity*, analogous to Table 2, but estimated separately for domestic (Panel A) and foreign investors (Panel B). Relative to foreign investors, domestic investors overweight firms with higher *Ln. Indirect Water Use*, reflecting upstream supply chain water use that can occur either domestically or abroad. This relative overweighting disappears for *Direct Water Use*, which captures water consumed directly by the firm. Direct water use is negatively associated with institutional ownership for both domestic and foreign investors. No significant association is observed for the water use intensity measures. The results are robust to alternative lag structures; estimates using three- and nine-month lags of water use are reported in Tables A.4 and A.5 in the appendix.

Table 6 presents regressions of institutional ownership on Δ *Water Levels Total, HQ*, and *Assets*, analogous to Table 3, but estimated separately for domestic (Panel A) and foreign investors (Panel B). The results indicate that the previously observed positive associations between changes in water levels and institutional ownership are primarily driven by domestic investors. The effect is concentrated at headquarters: a one-meter change in headquarter water levels is associated with a 33.37–35.21 percentage point change in domestic ownership. A one-standard-deviation change corresponds to a 2.04–2.15 percentage point change, or 5.00—5.27% relative to the mean firm. Domestic investors do not show an association with water level changes at production assets. This geographic pattern is consistent with investors responding primarily to locations likely in their home country, such as headquarter locations, rather than globally dispersed asset locations. Conversely, foreign institutional ownership is consistently positively associated with water level declines at asset locations. It is also associated with water level declines at the headquarters, though the association

Table 5: Domestic vs. Foreign Institutional Ownership and Water Use

This table reports the results of the regressions of domestic (panel A) and foreign (panel B) institutional ownership on *Total Water Use*, *Direct Water Use*, *Indirect Water Use*, *Total Water Use Intensity*, *Direct Water Use Intensity*, and *Indirect Water Use Intensity*, all lagged by six months. Variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Domestic Institutional Ownership								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln. Total Water Use	0.5358***	1.4653***						
	(3.4334)	(7.7020)						
Ln. Direct Water Use			-0.3633***	0.1231				
			(-3.6468)	(1.0495)				
Ln. Indirect Water Use			1.3015***	1.4848***				
			(7.5756)	(6.1115)				
Total Water Use Intensity					-0.0000***	0.0000		
					(-5.4133)	(0.7185)		
Direct Water Use Intensity							-0.0000***	0.0000
							(-5.5088)	(0.2395)
Indirect Water Use Intensity							-0.0000	0.0000
							(-1.5234)	(0.4706)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	124,307	124,221	124,237	124,151	124,307	124,221	124,307	124,221
R-squared	0.8678	0.8791	0.8695	0.8792	0.8683	0.8768	0.8685	0.8768
Panel B: Foreign Institutional Ownership								
Ln. Total Water Use	-0.1850**	-0.1487						
	(-2.0422)	(-1.2903)						
Ln. Direct Water Use			-0.2312***	-0.2363***				
			(-3.9246)	(-3.0730)				
Ln. Indirect Water Use			0.1576	0.1349				
			(1.5107)	(0.9127)				
Total Water Use Intensity					-0.0000***	-0.0000		
					(-4.6459)	(-1.5847)		
Direct Water Use Intensity							-0.0000***	-0.0000
							(-4.3408)	(-1.4174)
Indirect Water Use Intensity							-0.0000	-0.0000
							(-0.6921)	(-1.1855)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	124,307	124,221	124,237	124,151	124,307	124,221	124,307	124,221
R-squared	0.4192	0.4705	0.4202	0.4711	0.4205	0.4705	0.4204	0.4706

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

is weaker than for domestic investors. Overall, water level changes explain less variation in foreign ownership than in domestic ownership, as reflected in the lower R-squared values.

The associations between water level changes and both domestic and foreign institutional ownership remain stable across different time horizons. Appendix Table A.6 reports regressions using rolling averages of water level changes over horizons ranging from three months to fifteen years. Appendix figures A.5 and A.6 visualize these estimates for headquarter and asset locations

Table 6: Domestic vs. Foreign Institutional Ownership and Δ Water Levels

This table reports the results of the regressions of domestic (panel A) and foreign (panel B) institutional ownership on Δ*Water Levels Total*, Δ*Water Levels HQ* and Δ*Water Levels Assets*, all lagged by two months to account for a 40-60 reporting lag. *Rise* and *Fall* capture increases and decreases in water levels respectively. Other variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Domestic Institutional Ownership						
Institutional Ownership	(1)	(2)	(3)	(4)	(5)	(6)
Δ Water Levels Total	6.5995**	7.0728**				
	(2.1391)	(2.3605)				
Δ Water Levels HQ			35.2171***	33.3722***		
			(4.6332)	(4.2196)		
Δ Water Levels Assets			-1.0852	-0.6312		
			(-0.3298)	(-0.2087)		
Δ Water Levels HQ - Rise					33.7760***	34.5407***
					(3.4130)	(3.2726)
Δ Water Levels HQ - Fall					35.1312***	30.5289***
					(3.0838)	(2.7325)
Δ Water Levels Assets - Rise					9.4356	14.2426
					(0.9113)	(1.3843)
Δ Water Levels Assets - Fall					-3.8937	-4.3909
					(-1.2683)	(-1.4634)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	190,406	190,371	34,401	33,833	34,401	33,833
R-squared	0.7752	0.7906	0.8165	0.8393	0.8166	0.8394
Panel B: Foreign Institutional Ownership						
Δ Water Levels Total	0.5613	0.7989				
	(0.4159)	(0.5816)				
Δ Water Levels HQ			2.9925	5.7853		
			(0.8196)	(1.5292)		
Δ Water Levels Assets			6.4401***	5.3464**		
			(2.8440)	(2.3405)		
Δ Water Levels HQ - Rise					-0.2370	0.1427
					(-0.0326)	(0.0193)
Δ Water Levels HQ - Fall					7.2192	11.9045**
					(1.4681)	(2.4012)
Δ Water Levels Assets - Rise					-2.5410	-2.4579
					(-0.3227)	(-0.3059)
Δ Water Levels Assets - Fall					8.8884***	7.3533***
					(3.8294)	(3.2644)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	190,406	190,371	34,401	33,833	34,401	33,833
R-squared	0.4068	0.4380	0.4120	0.4645	0.4126	0.4650

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Domestic vs. Foreign Institutional Ownership and Water Stress

This table reports the results of the regressions of domestic (panel A) and foreign (panel B) institutional ownership on on water stress, constructed as the interaction of the six-months lagged *Ln. Direct Water Use* and Δ*Water Levels HQ* and Δ*Water Levels Assets* respectively, using different rolling averages. Variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Domestic Institutional Ownership						
Institutional Ownership	3 Months	3 Months	6 Months	6 Months	1 Year	1 Year
Water Stress HQ	-0.9256**	-0.7805**	-0.9635**	-0.8116**	-1.0139**	-0.8534**
	(-2.5766)	(-2.0762)	(-2.5642)	(-2.0691)	(-2.5456)	(-2.0605)
Water Stress Assets	0.1901	0.1339	0.1835	0.1317	0.1686	0.1211
	(0.6867)	(0.4814)	(0.6485)	(0.4615)	(0.5845)	(0.4142)
Ln. Direct Water Use	0.1391	0.3982**	0.1381	0.3973**	0.1372	0.3964**
	(0.8326)	(2.1345)	(0.8273)	(2.1311)	(0.8217)	(2.1271)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	20,915	20,426	20,915	20,426	20,915	20,426
R-squared	0.8925	0.9112	0.8925	0.9112	0.8925	0.9112
	5 Years	5 Years	10 Years	10 Years	15 Years	15 Years
Water Stress HQ	-1.4260**	-1.1854**	-2.0672**	-1.8253**	-2.8238**	-2.4597*
	(-2.6555)	(-2.1310)	(-2.4533)	(-2.0702)	(-2.4113)	(-1.9742)
Water Stress Assets	0.0210	-0.0076	0.0348	-0.0474	-0.0154	-0.0749
	(0.0638)	(-0.0227)	(0.0773)	(-0.1042)	(-0.0256)	(-0.1279)
Ln. Direct Water Use	0.1488	0.3888**	0.2407	0.4126**	0.4325**	0.5188**
	(0.9050)	(2.1365)	(1.4580)	(2.1899)	(2.4088)	(2.5670)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	20,126	19,702	14,807	14,564	6,539	6,449
R-squared	0.8921	0.9105	0.8918	0.9069	0.8832	0.8974

Table 7 presents regressions of institutional ownership on *Water Stress HQ* and *Water Stress Assets*, analogous to Table 4, but estimated separately for domestic (Panel A) and foreign investors (Panel B). The negative association between water stress at headquarters and institutional ownership is entirely driven by domestic investors: decreasing water levels for a given level of direct water use correspond to reduced domestic holdings. This effect is absent for water stress at asset locations across all horizons. Foreign investors show the opposite pattern, with a significant and persistent negative association between water stress at asset locations and foreign holdings, but no association at headquarters.

Panel B: Foreign Institutional Ownership						
Institutional Ownership	3 Months	3 Months	6 Months	6 Months	1 Year	1 Year
Water Stress HQ	-0.0350	-0.1063	-0.0273	-0.1002	-0.0099	-0.0846
	(-0.1687)	(-0.4866)	(-0.1263)	(-0.4389)	(-0.0439)	(-0.3537)
Water Stress Assets	-0.6973**	-0.5694*	-0.7168**	-0.5834*	-0.7397**	-0.6057*
	(-2.4569)	(-1.8713)	(-2.4994)	(-1.8921)	(-2.5202)	(-1.9228)
Ln. Direct Water Use	-0.1065	-0.1663	-0.1062	-0.1663	-0.1055	-0.1658
	(-1.0695)	(-1.2999)	(-1.0664)	(-1.2993)	(-1.0583)	(-1.2948)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	20,915	20,426	20,915	20,426	20,915	20,426
R-squared	0.5506	0.6155	0.5507	0.6155	0.5507	0.6155
	5 Years	5 Years	10 Years	10 Years	15 Years	15 Years
Water Stress HQ	-0.0139	-0.1426	-0.0545	-0.2373	0.3081	-0.1896
	(-0.0452)	(-0.4423)	(-0.1149)	(-0.4686)	(0.4538)	(-0.2743)
Water Stress Assets	-0.9431***	-0.7956**	-1.3040**	-1.1173**	-1.8549**	-1.6096**
	(-2.6835)	(-2.1605)	(-2.5674)	(-2.2010)	(-2.4723)	(-2.2260)
Ln. Direct Water Use	-0.1044	-0.1678	-0.1214	-0.2004*	-0.0868	-0.1733
	(-1.0726)	(-1.3413)	(-1.2990)	(-1.7167)	(-0.8450)	(-1.3974)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	20,126	19,702	14,807	14,564	6,539	6,449
R-squared	0.5469	0.6113	0.5254	0.5921	0.5500	0.6152

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The marginal effect of water stress beyond water use reinforces the pattern already suggested in Table 4: institutional capital allocation to firms using large quantities of water depends on local water supply. There is notable heterogeneity between domestic and foreign investors. Domestic investors' holdings are more strongly associated with water stress at headquarters, typically located in their home country, whereas foreign investors' holdings are more strongly associated with water stress at asset locations, more likely located in their respective home countries. These patterns are consistent with lower institutional ownership of firms exposed to and potentially exacerbating water stress, particularly when investors are local. This may reflect portfolio tilts away from firms whose water use imposes negative externalities on the home economy.

4. Conclusion

This paper examines how institutional investors allocate capital to firms exposed to, and potentially exacerbating, local water scarcity. Water is a vital, non-substitutable resource, and its depletion

can impose negative externalities on other firms in the local economy. Domestic investors may face stronger incentives than foreign investors to limit financing of firms that exacerbate local scarcity.

I find that aggregate institutional ownership is consistently lower for firms with greater exposure to water scarcity, whether measured by firm water use, changes in local water levels, or water stress. Horizon analyses show that these associations reflect long-term, persistent scarcity rather than transitory fluctuations, consistent with gradually depleting local water resources. There is substantial heterogeneity between domestic and foreign investors. Domestic holdings are most strongly associated with water level changes and water stress at headquarters, typically located in the home country, whereas foreign holdings respond primarily to conditions at production assets, often abroad.

These patterns suggest that investor exposure to local water scarcity shapes portfolio allocation, with domestic investors particularly responsive to home-country scarcity, illustrating how increasing resource constraints can influence the geographic distribution of institutional capital.

References

Alok, S., Kumar, N., and Wermers, R. (2020, 3). Do Fund Managers Misestimate Climatic Disaster Risk? *The Review of Financial Studies*, *33*(3), 1146–1183.

Boermans, M. A., and Galema, R. (2025). Carbon home bias of European investors. *Journal of Corporate Finance*, *92*.

Bolton, P., Eskildsen, M., and Kacperczyk, M. (2024). Carbon Home Bias. *SSRN Work. Pap*, *4708844*.

Chaieb, I., Errunza, V., and Lu, L. Y. (2024). Sustainable Investing Home and Abroad. *Swiss Finance Institute Research Paper*, 24–71.

Chan, K., Covrig, V., and Ng, L. (2005, 6). What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *Journal of Finance*, *60*(3), 1495–1534.

Dasgupta, S., Huynh, T. D., and Xia, Y. (2023, 9). Joining Forces: The Spillover Effects of EPA Enforcement Actions and the Role of Socially Responsible Investors. *Review of Financial Studies*, *36*(9), 3781–3824.

Fama, E. F., and French, K. R. (1992). The Cross-Section of Expected Stock Returns. *The Journal of Finance*, *47*(2), 427–465.

Ferreira, M. A., and Matos, P. (2008, 6). The colors of investors' money: The role of institutional investors around the world. *Journal of Financial Economics*, *88*(3), 499–533.

French, K. R., and Poterba, J. M. (1991). Investor Diversification and International Equity Markets. *The American Economic Review*, *81*(2), 222–226.

Gerasimova, N., and Rohrer, M. (2023). Not by whom but where: ESG events, place attachment, and firm value. Retrieved from https://ssrn.com/abstract=4121755

Karolyi, G. A., and Stulz, R. M. (2003). Are Financial Assets Priced Locally or Globally? *Handbook of the Economics of Finance*, 975–1020.

Lewis, K. K. (1999). Trying to Explain Home Bias in Equities and Consumption. *Journal of Economic Literature*, *37*, 571–608.

Tversky, A., and Kahneman, D. (1973). Availability: A Heuristic for Judging Frequency and Probability. *Cognitive Psychology*, *5*, 207–232.

Van Nieuwerburgh, S., and Veldkamp, L. (2009, 6). Information immobility and the home bias puzzle. *Journal of Finance*, *64*(3), 1187–1215.

A. Appendix

A.1. Figures

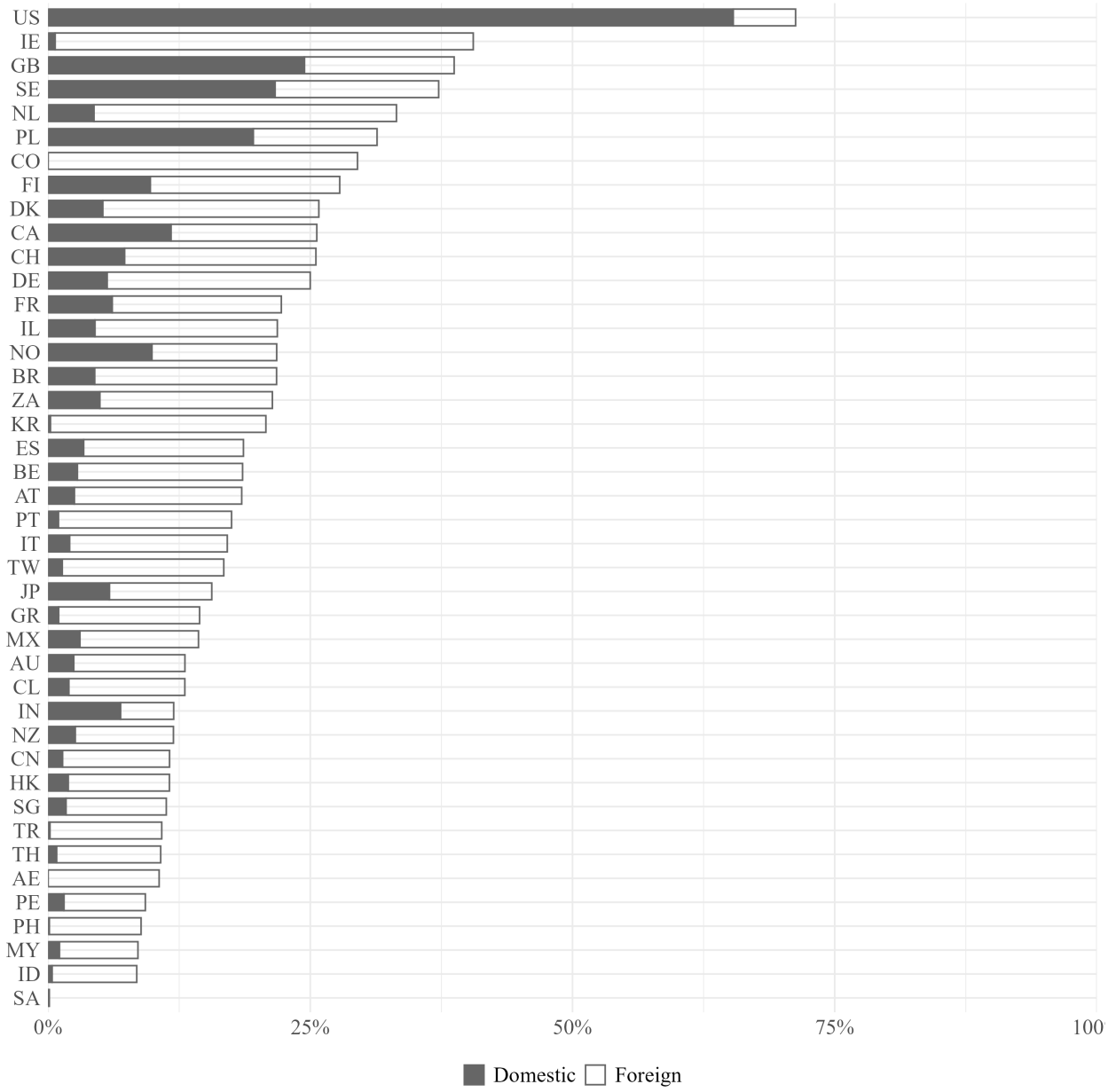


Figure A.1: Domestic and Foreign Institutional Ownership by Country

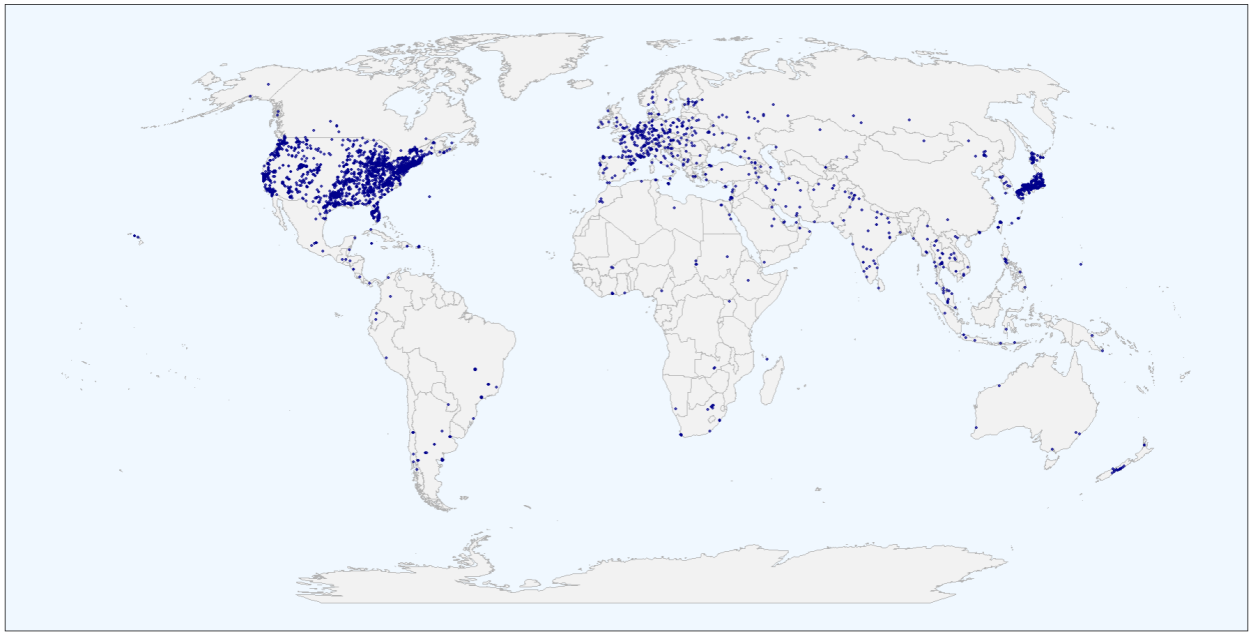


Figure A.2: Firm Headquarter Locations

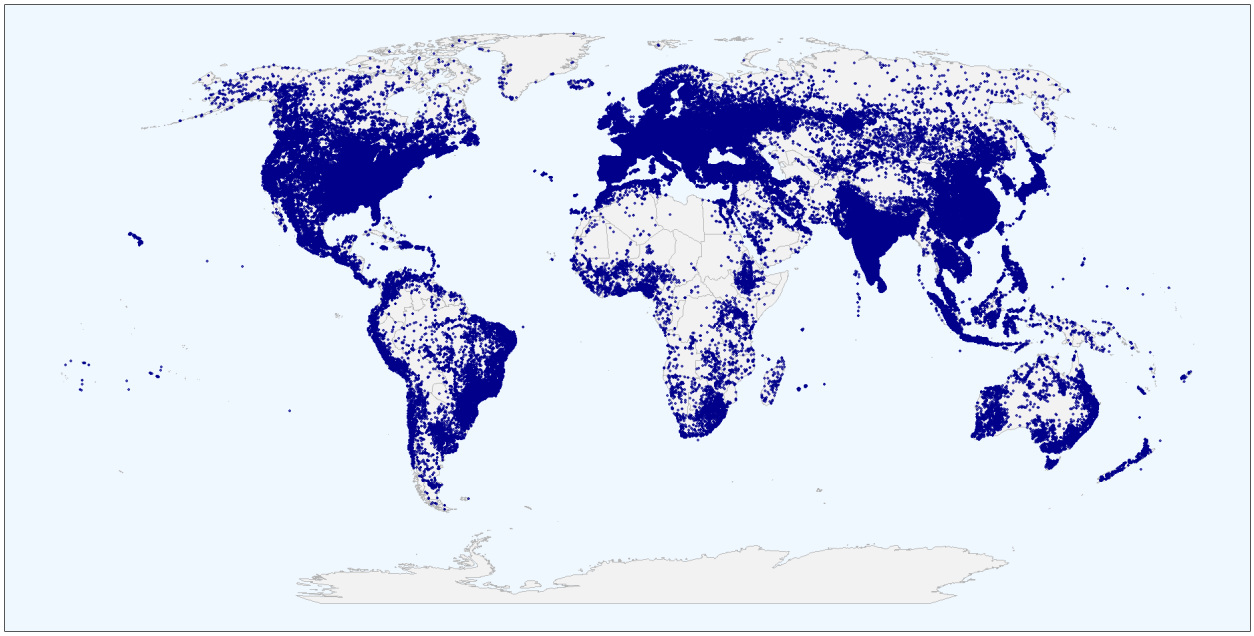


Figure A.3: Firm Asset Locations

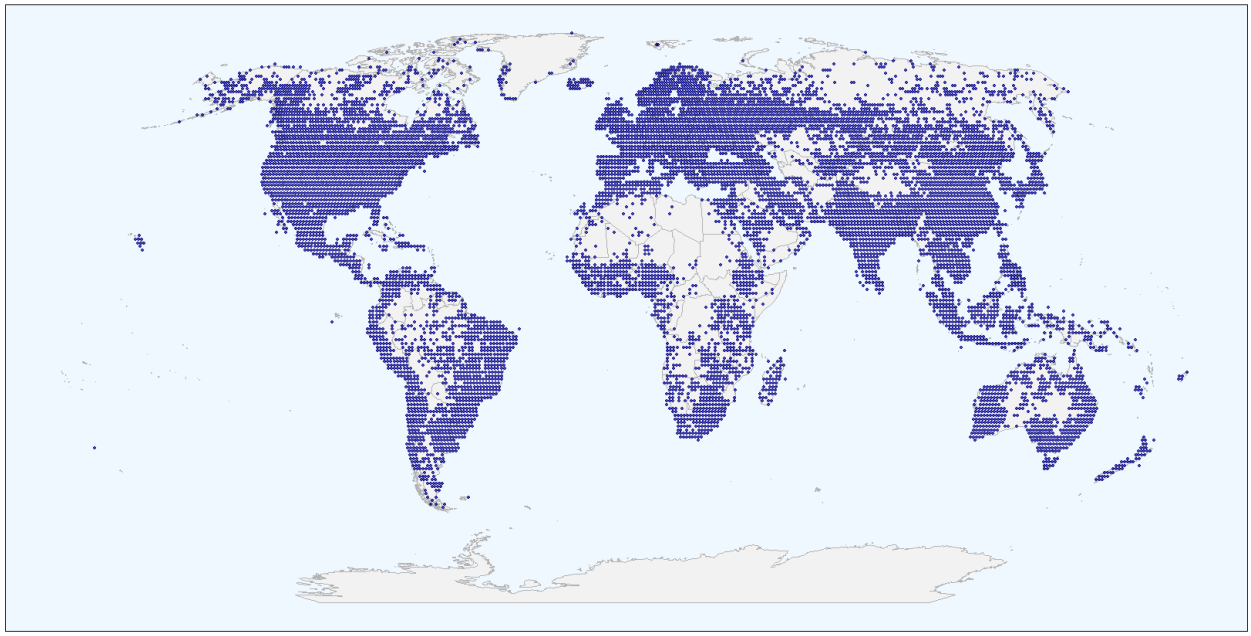


Figure A.4: Matched NASA Grid Points

Table A.1: Institutional Ownership and Water Use: Three-Month Lag

This table reports the results of the regression of institutional ownership on *Total Water Use*, *Direct Water Use*, *Indirect Water Use*, *Total Water Use Intensity*, *Direct Water Use Intensity*, and *Indirect Water Use Intensity*, all lagged by three months. Variable definitions are provided in Table 1. Regressions include country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Institutional Ownership	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln. Total Water Use	0.4009**	1.3862***						
	(2.0292)	(5.7983)						
Ln. Direct Water Use			-0.5986***	-0.1169				
			(-5.3140)	(-0.8623)				
Ln. Indirect Water Use			1.5198***	1.7059***				
			(7.3435)	(5.5586)				
Total Water Use Intensity					-0.0000***	-0.0000		
					(-7.4062)	(-0.1184)		
Direct Water Use Intensity							-0.0000***	-0.0000
							(-7.4025)	(-0.5640)
Indirect Water Use Intensity							-0.0000*	-0.0000
							(-1.6974)	(-0.2700)
Ln. Size	1.1148***	0.8882***	0.6567**	0.6924**	1.5307***	2.1669***	1.5529***	2.1673***
	(4.2727)	(3.2116)	(2.4926)	(2.4191)	(6.1190)	(8.7171)	(6.2094)	(8.7198)
Investments/Assets	-57.1372***	17.7994	-47.2966***	17.0986	-44.0376**	14.2650	-43.1207**	14.3039
	(-3.1895)	(1.0040)	(-2.6622)	(0.9692)	(-2.4693)	(0.8131)	(-2.4249)	(0.8135)
Leverage	-2.1502	1.9665	-1.9065	1.8323	0.2163	4.4346***	0.4090	4.4745***
	(-1.5219)	(1.4034)	(-1.3629)	(1.3098)	(0.1475)	(2.9865)	(0.2781)	(3.0137)
Book-to-Market	-0.1426	0.1401	-0.2178	0.0703	0.4790	1.0373***	0.5132	1.0444***
	(-0.4272)	(0.4098)	(-0.6619)	(0.2060)	(1.3768)	(2.8803)	(1.4696)	(2.9018)
Return on Equity	8.7595***	-0.4278	4.8091	-1.1667	8.4893***	2.5772	8.0703**	2.5436
	(2.7707)	(-0.1341)	(1.5456)	(-0.3634)	(2.7535)	(0.8116)	(2.6087)	(0.8006)
Volatility	-57.5747***	-54.9775***	-54.0909***	-54.2268***	-61.2406***	-60.8342***	-61.0887***	-60.8533***
	(-11.5701)	(-12.2937)	(-11.1072)	(-12.3514)	(-11.3944)	(-11.8011)	(-11.3790)	(-11.8058)
Beta	1.9412***	0.7775***	1.6007***	0.7494***	1.6413***	0.9378***	1.6314***	0.9363***
	(5.9937)	(2.7265)	(5.2023)	(2.6545)	(5.1417)	(3.1274)	(5.1258)	(3.1228)
Momentum	1.9150***	1.8485***	1.9024***	1.8329***	1.9182***	1.8164***	1.9217***	1.8154***
	(5.4421)	(4.9879)	(5.5651)	(5.0438)	(5.4366)	(4.6045)	(5.4683)	(4.6076)
Constant	34.3707***	17.8083***	27.2067***	15.8864***	38.5128***	31.4339***	38.1643***	31.5371***
	(10.3661)	(4.7820)	(8.4191)	(4.0163)	(17.5536)	(14.0753)	(17.2811)	(14.0018)
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	127,835	127,743	127,748	127,656	127,835	127,743	127,835	127,743
R-squared	0.7822	0.8050	0.7853	0.8054	0.7843	0.8028	0.7846	0.8028

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.2: Institutional Ownership Water Use: Nine-Month Lag

This table reports the results of the regression of institutional ownership on *Total Water Use*, *Direct Water Use*, *Indirect Water Use*, *Total Water Use Intensity*, *Direct Water Use Intensity*, and *Indirect Water Use Intensity*, all lagged by nine months. Variable definitions are provided in Table 1. Regressions include country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Institutional Ownership	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln. Total Water Use	0.2953	1.2430***						
	(1.4670)	(5.0692)						
Ln. Direct Water Use			-0.5935***	-0.1104				
			(-5.2261)	(-0.7887)				
Ln. Indirect Water Use			1.3956***	1.5291***				
			(6.5001)	(4.7870)				
Total Water Use Intensity					-0.0000***	-0.0000		
					(-7.1341)	(-0.0751)		
Direct Water Use Intensity							-0.0000***	-0.0000
							(-7.1226)	(-0.4930)
Indirect Water Use Intensity							-0.0000*	-0.0000
							(-1.7342)	(-0.3780)
Ln. Size	1.1316***	0.9467***	0.6890**	0.7795***	1.4499***	2.0889***	1.4728***	2.0894***
	(4.2790)	(3.3996)	(2.5766)	(2.7072)	(5.6371)	(8.1814)	(5.7219)	(8.1832)
Investments/Assets	-58.8880***	19.7463	-48.6258***	18.9132	-46.7620**	14.9208	-45.8024**	15.0224
	(-3.1840)	(1.0760)	(-2.6530)	(1.0349)	(-2.5425)	(0.8202)	(-2.4978)	(0.8240)
Leverage	-2.2450	1.9724	-2.0413	1.8663	-0.1228	4.1772***	0.0677	4.2218***
	(-1.5649)	(1.3876)	(-1.4372)	(1.3175)	(-0.0822)	(2.7631)	(0.0452)	(2.7934)
Book-to-Market	-0.2138	0.0815	-0.2914	0.0242	0.3203	0.8835**	0.3546	0.8908**
	(-0.6330)	(0.2367)	(-0.8746)	(0.0705)	(0.8994)	(2.4149)	(0.9919)	(2.4366)
Return on Equity	9.2725***	0.2269	5.6897*	-0.3815	8.5357***	2.5202	8.0971**	2.4784
	(2.9314)	(0.0704)	(1.8162)	(-0.1174)	(2.7710)	(0.7906)	(2.6196)	(0.7771)
Volatility	-54.5836***	-52.1881***	-51.3202***	-51.5500***	-57.5097***	-57.2388***	-57.4055***	-57.2556***
	(-10.5179)	(-11.2101)	(-10.1236)	(-11.2681)	(-10.3854)	(-10.8051)	(-10.3820)	(-10.8081)
Beta	1.8730***	0.7071**	1.5342***	0.6791**	1.5571***	0.8565***	1.5477***	0.8548***
	(5.6833)	(2.4053)	(4.8565)	(2.3279)	(4.8008)	(2.7871)	(4.7874)	(2.7825)
Momentum	2.1480***	2.1255***	2.1548***	2.1187***	2.1374***	2.0698***	2.1429***	2.0693***
	(6.1313)	(5.6378)	(6.2884)	(5.7022)	(6.1210)	(5.2489)	(6.1599)	(5.2545)
Constant	36.1222***	19.7984***	29.1022***	18.1124***	39.2330***	32.0500***	38.9029***	32.1923***
	(10.5801)	(5.1167)	(8.6143)	(4.3763)	(17.3970)	(13.9701)	(17.1204)	(13.9011)
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	120,696	120,611	120,643	120,558	120,696	120,611	120,696	120,611
R-squared	0.7876	0.8100	0.7903	0.8103	0.7898	0.8082	0.7900	0.8082

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.3: Institutional Ownership Δ Water Levels: Using Rolling Averages

This table reports the results of the regressions of institutional ownership on Δ *Water Levels HQ - Rise*, Δ *Water Levels HQ - Fall*, Δ *Water Levels Assets - Rise*, and Δ *Water Levels Assets - Fall* using rolling averages. Variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Institutional Ownership	3 Months	3 Months	6 Months	6 Months	1 Year	1 Year
Δ Water Levels HQ - Rise	34.6659**	34.9137**	36.5562**	36.9165**	39.4533**	39.3321**
	(2.4358)	(2.4024)	(2.4293)	(2.4077)	(2.4368)	(2.4025)
Δ Water Levels HQ - Fall	44.1821***	44.7642***	45.5954***	46.1504***	46.6765***	47.5800***
	(3.2228)	(3.3210)	(3.2010)	(3.2854)	(3.0720)	(3.1704)
Δ Water Levels Assets - Rise	10.9109	15.8052	12.6886	17.8357	14.8608	20.3654
	(0.7656)	(1.1335)	(0.8337)	(1.2000)	(0.9069)	(1.2783)
Δ Water Levels Assets - Fall	4.6253	2.6049	4.5387	2.5017	4.4630	2.3418
	(1.1092)	(0.6126)	(1.0683)	(0.5781)	(1.0329)	(0.5297)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	34,405	33,837	34,405	33,837	34,405	33,837
R-squared	0.7370	0.7656	0.7371	0.7657	0.7372	0.7658
	5 Years	5 Years	10 Years	10 Years	15 Years	15 Years
Δ Water Levels HQ - Rise	49.0530**	44.2785*	53.8091	46.2490	39.7411	19.8032
	(2.1447)	(1.9098)	(1.4321)	(1.2120)	(0.7644)	(0.3838)
Δ Water Levels HQ - Fall	66.3478***	69.6297***	111.0177***	120.6021***	176.2495**	195.5711***
	(2.8177)	(2.9629)	(2.8259)	(3.0842)	(3.0435)	(3.3637)
Δ Water Levels Assets - Rise	18.3044	25.2876	24.3583	34.7893	61.4645	69.1813
	(0.8292)	(1.1594)	(0.6677)	(0.9565)	(1.1435)	(1.3105)
Δ Water Levels Assets - Fall	5.8997	3.3684	6.2073	3.5623	3.6113	0.6179
	(1.1327)	(0.6360)	(0.8544)	(0.4708)	(0.3499)	(0.0576)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	32,140	31,640	22,792	22,514	9,652	9,556
R-squared	0.7355	0.7615	0.7304	0.7538	0.7272	0.7505

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.4: Domestic vs. Foreign Institutional Ownership and Water Use: Three-Month Lag

This table reports the results of the regressions of domestic (panel A) and foreign (panel B) institutional ownership on *Total Water Use*, *Direct Water Use*, *Indirect Water Use*, *Total Water Use Intensity*, *Direct Water Use Intensity*, and *Indirect Water Use Intensity*, all lagged by three months. Variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Domestic Institutional Ownership								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln. Total Water Use	0.5737***	1.5202***						
	(3.7132)	(8.1040)						
Ln. Direct Water Use			-0.3659***	0.1206				
			(-3.6856)	(1.0433)				
Ln. Indirect Water Use			1.3485***	1.5535***				
			(7.9618)	(6.5080)				
Total Water Use Intensity					-0.0000***	0.0000		
					(-5.5205)	(0.7161)		
Direct Water Use Intensity							-0.0000***	0.0000
							(-5.6163)	(0.2249)
Indirect Water Use Intensity							-0.0000	0.0000
							(-1.5006)	(0.5247)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	127,835	127,743	127,748	127,656	127,835	127,743	127,835	127,743
R-squared	0.8656	0.8770	0.8674	0.8771	0.8660	0.8745	0.8663	0.8745
Panel B: Foreign Institutional Ownership								
Ln. Total Water Use	-0.1729*	-0.1341						
	(-1.9246)	(-1.1814)						
Ln. Direct Water Use			-0.2327***	-0.2374***				
			(-3.9815)	(-3.1423)				
Ln. Indirect Water Use			0.1713	0.1524				
			(1.6632)	(1.0513)				
Total Water Use Intensity					-0.0000***	-0.0000		
					(-4.6987)	(-1.6267)		
Direct Water Use Intensity							-0.0000***	-0.0000
							(-4.3985)	(-1.4588)
Indirect Water Use Intensity							-0.0000	-0.0000
							(-0.7029)	(-1.1877)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	127,835	127,743	127,748	127,656	127,835	127,743	127,835	127,743
R-squared	0.4186	0.4693	0.4198	0.4700	0.4201	0.4693	0.4199	0.4695

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.5: Domestic vs. Foreign Institutional Ownership and Water Use: Nine-Month Lag

This table reports the results of the regressions of domestic (panel A) and foreign (panel B) institutional ownership on *Total Water Use*, *Direct Water Use*, *Indirect Water Use*, *Total Water Use Intensity*, *Direct Water Use Intensity*, and *Indirect Water Use Intensity*, all lagged by nine months. Variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Domestic Institutional Ownership								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln. Total Water Use	0.4953***	1.4096***						
	(3.1488)	(7.3357)						
Ln. Direct Water Use			-0.3637***	0.1246				
			(-3.6382)	(1.0441)				
Ln. Indirect Water Use			1.2546***	1.4162***				
			(7.1887)	(5.7181)				
Total Water Use Intensity					-0.0000***	0.0000		
					(-5.3045)	(0.7209)		
Direct Water Use Intensity							-0.0000***	0.0000
							(-5.3969)	(0.2562)
Indirect Water Use Intensity							-0.0000	0.0000
							(-1.5520)	(0.4043)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	120,696	120,611	120,643	120,558	120,696	120,611	120,696	120,611
R-squared	0.8701	0.8812	0.8717	0.8813	0.8707	0.8791	0.8709	0.8791
Panel B: Foreign Institutional Ownership								
Ln. Total Water Use	-0.2000**	-0.1666						
	(-2.1861)	(-1.4246)						
Ln. Direct Water Use			-0.2298***	-0.2350***				
			(-3.8701)	(-2.9918)				
Ln. Indirect Water Use			0.1410	0.1130				
			(1.3324)	(0.7487)				
Total Water Use Intensity					-0.0000***	-0.0000		
					(-4.5940)	(-1.5330)		
Direct Water Use Intensity							-0.0000***	-0.0000
							(-4.2818)	(-1.3607)
Indirect Water Use Intensity							-0.0000	-0.0000
							(-0.6890)	(-1.1948)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes		Yes
Observations	120,696	120,611	120,643	120,558	120,696	120,611	120,696	120,611
R-squared	0.4197	0.4718	0.4206	0.4724	0.4209	0.4717	0.4208	0.4719

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.6: Domestic vs. Foreign Institutional Ownership and Δ Water Levels

This table reports the results of the regressions of domestic (panel A) and foreign (panel B) institutional ownership on Δ*Water Levels HQ* and Δ*Water Levels Assets*, using different rolling averages. *Rise* and *Fall* capture increases and decreases in water levels respectively. Other variable definitions are provided in Table 1. All regressions include a constant, the same controls as in Table 2, and country×quarter/year fixed effects, with even-numbered models additionally including industry×quarter/year fixed effects. Standard errors are double-clustered at the firm and quarter/year level. ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Domestic Institutional Ownership						
Institutional Ownership	3 Months	3 Months	6 Months	6 Months	1 Year	1 Year
Δ Water Levels HQ - Rise	35.7430***	35.8563***	37.4470***	37.5620***	40.0649***	39.8176***
	(3.4281)	(3.2345)	(3.3918)	(3.2100)	(3.3571)	(3.1744)
Δ Water Levels HQ - Fall	36.6563***	32.0794***	38.2277***	33.4699***	39.5208***	34.8250**
	(2.9956)	(2.6768)	(2.9958)	(2.6735)	(2.9013)	(2.6052)
Δ Water Levels Assets - Rise	12.8020	18.0031	14.0168	19.5961*	16.1064	22.0771*
	(1.1730)	(1.6548)	(1.1938)	(1.6826)	(1.2647)	(1.7589)
Δ Water Levels Assets - Fall	-4.2993	-4.8777	-4.4539	-5.0447	-4.6429	-5.3023
	(-1.3876)	(-1.5915)	(-1.4040)	(-1.6105)	(-1.4409)	(-1.6549)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	34,405	33,837	34,405	33,837	34,405	33,837
R-squared	0.8168	0.8396	0.8169	0.8397	0.8170	0.8398
	5 Years	5 Years	10 Years	10 Years	15 Years	15 Years
Δ Water Levels HQ - Rise	47.4477***	43.7139***	56.1957**	52.7306*	57.9036	41.2459
	(3.0428)	(2.6798)	(2.2429)	(2.0225)	(1.4911)	(1.0639)
Δ Water Levels HQ - Fall	58.3157***	54.0169**	99.7953***	95.3276***	156.5008**	152.5942**
	(2.8408)	(2.6486)	(2.8863)	(2.7955)	(3.0774)	(3.0317)
Δ Water Levels Assets - Rise	26.9455	32.9662*	38.4855	44.2795	83.3590*	88.5182*
	(1.5804)	(1.9396)	(1.3939)	(1.5995)	(1.9811)	(2.1457)
Δ Water Levels Assets - Fall	-5.3066	-5.6621	-8.1593	-7.5711	-14.4463	-13.6398*
	(-1.3672)	(-1.4619)	(-1.4497)	(-1.3789)	(-1.7882)	(-1.8370)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	32,140	31,640	22,792	22,514	9,652	9,556
R-squared	0.8153	0.8357	0.8111	0.8286	0.8082	0.8251

Panel B: Foreign Institutional Ownership						
Institutional Ownership	3 Months	3 Months	6 Months	6 Months	1 Year	1 Year
Δ Water Levels HQ - Rise	-1.0771	-0.9426	-0.8909	-0.6455	-0.6116	-0.4855
	(-0.1395)	(-0.1202)	(-0.1088)	(-0.0776)	(-0.0699)	(-0.0548)
Δ Water Levels HQ - Fall	7.5258	12.6848**	7.3676	12.6805**	7.1557	12.7550**
	(1.4229)	(2.3705)	(1.3286)	(2.2635)	(1.2148)	(2.1494)
Δ Water Levels Assets - Rise	-1.8911	-2.1979	-1.3282	-1.7604	-1.2457	-1.7117
	(-0.2300)	(-0.2617)	(-0.1527)	(-0.1979)	(-0.1345)	(-0.1808)
Δ Water Levels Assets - Fall	8.9246***	7.4827***	8.9926***	7.5463***	9.1060***	7.6441***
	(3.8099)	(3.3077)	(3.7878)	(3.2944)	(3.7696)	(3.2809)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	34,405	33,837	34,405	33,837	34,405	33,837
R-squared	0.4126	0.4651	0.4125	0.4650	0.4125	0.4649
	5 Years	5 Years	10 Years	10 Years	15 Years	15 Years
Δ Water Levels HQ - Rise	1.6053	0.5646	-2.3866	-6.4816	-18.1625	-21.4427
	(0.1197)	(0.0421)	(-0.1075)	(-0.2901)	(-0.6869)	(-0.8018)
Δ Water Levels HQ - Fall	8.0320	15.6128*	11.2223	25.2745*	19.7487	42.9769*
	(0.8914)	(1.7426)	(0.7814)	(1.7728)	(0.9206)	(1.9980)
Δ Water Levels Assets - Rise	-8.6411	-7.6785	-14.1272	-9.4902	-21.8945	-19.3369
	(-0.6569)	(-0.5763)	(-0.6181)	(-0.4104)	(-0.7113)	(-0.6202)
Δ Water Levels Assets - Fall	11.2063***	9.0304***	14.3666***	11.1335**	18.0576**	14.2576*
	(3.7821)	(3.1630)	(3.4043)	(2.6301)	(2.8086)	(2.1947)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter/Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Quarter/Year		Yes		Yes		Yes
Observations	32,140	31,640	22,792	22,514	9,652	9,556
R-squared	0.4057	0.4574	0.4193	0.4696	0.4459	0.4962

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

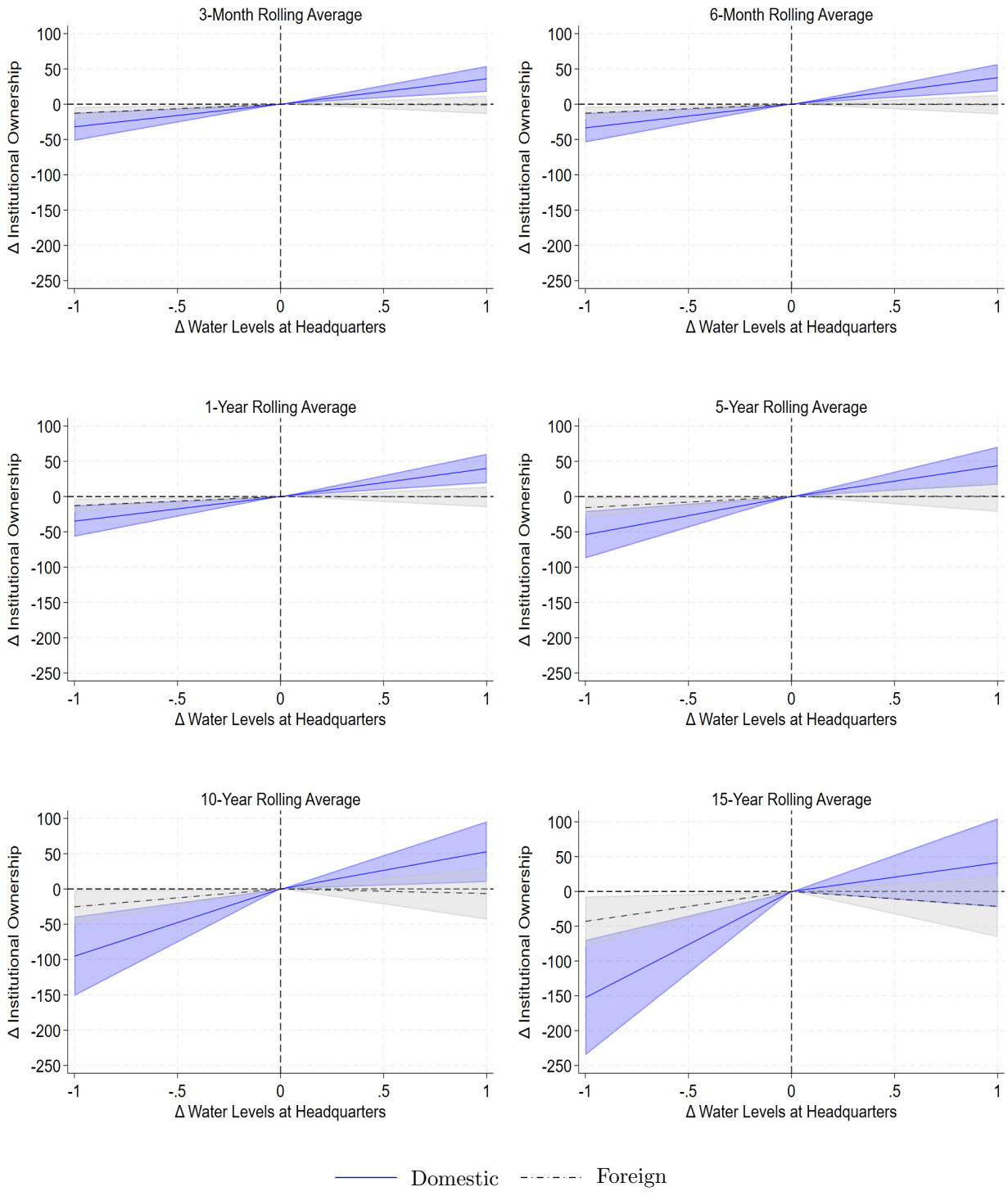


Figure A.5: Domestic vs. Foreign Institutional Ownership and Δ Water Levels HQ

This figure plots coefficients (with 90% confidence intervals) from regressions of domestic and foreign institutional ownership on changes in water levels at firm headquarters, using rolling averages over horizons ranging from three months to fifteen years. For each horizon, the left y-axis shows the change in institutional ownership associated with a one-unit change in water levels, separately for declines (left of the origin) and increases (right of the origin). The right y-axis reports the effect of a one-standard-deviation change in total water levels.

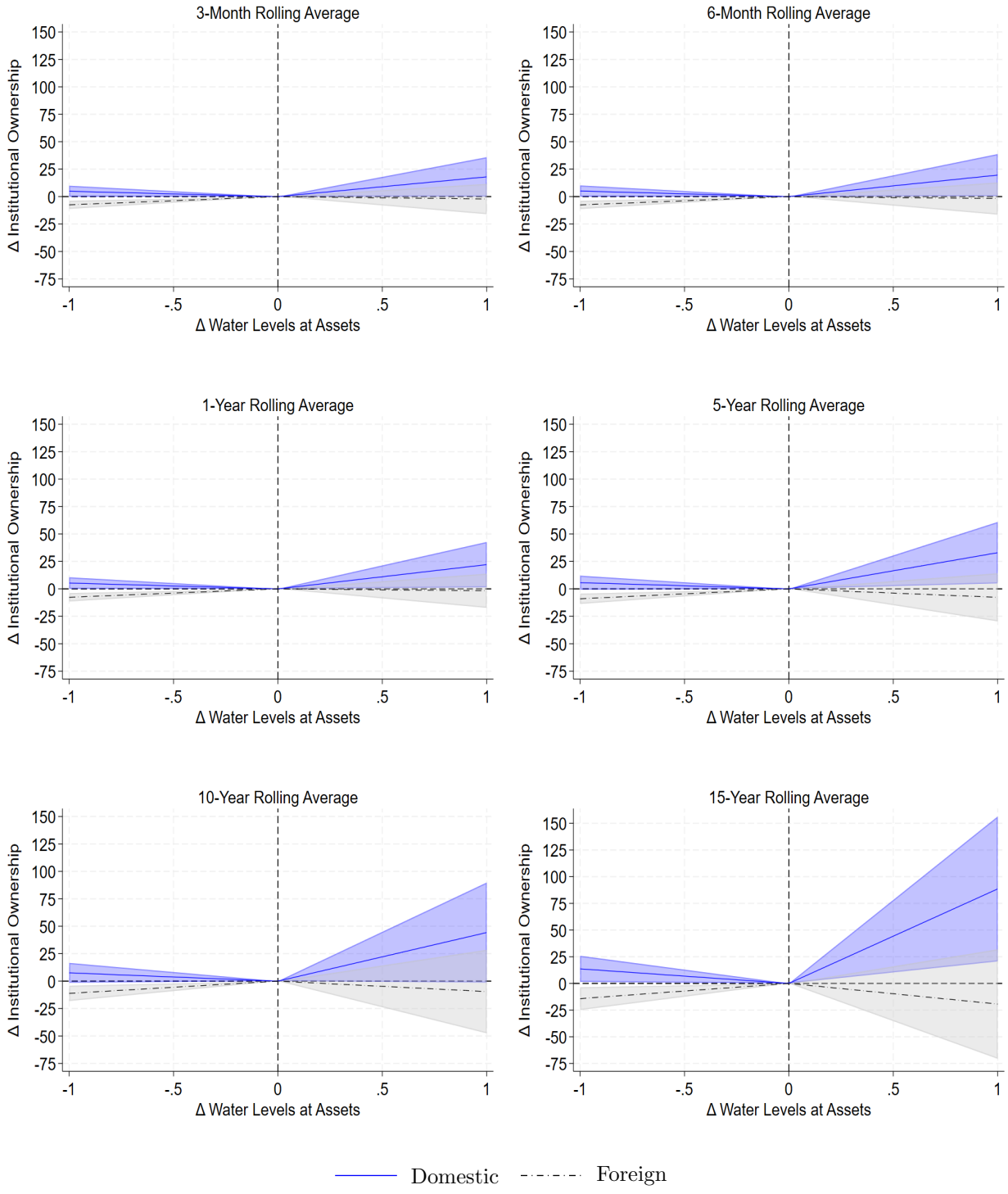


Figure A.6: Domestic vs. Foreign Institutional Ownership and Δ Water Levels Assets

This figure plots coefficients (with 90% confidence intervals) from regressions of domestic and foreign institutional ownership on changes in water levels at firm asset locations, using rolling averages over horizons ranging from three months to fifteen years. For each horizon, the left y-axis shows the change in institutional ownership associated with a one-unit change in water levels, separately for declines (left of the origin) and increases (right of the origin). The right y-axis reports the effect of a one-standard-deviation change in total water levels.