Passive Investing and the Allocation of Equity Financing

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Abstract

Real opportunities require financing, but investor demand determines where equity capital goes. I isolate opportunities using federal purchasing growth in markets served by a supplier's customers. These shocks raise supplier sales and issuance. Idiosyncratic passive inflows do not raise issuance on average across 8,806 firms. They make issuance more responsive to customer demand, especially for constrained suppliers. Installed indexed ownership weakens the same response; within a common opportunity, one standard deviation more installed ownership predicts 3.50 percentage points less issuance from a 10.61 percent base. Passive capital reallocates equity financing toward firms with real opportunities.

Keywords: customer-supplier networks, passive investing, equity issuance, investor demand, corporate finance
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1 Introduction

A firm can win a valuable customer order before it knows how the expansion will be financed. If internal funds fall short, the firm must persuade investors to absorb newly issued shares. Two demand conditions then meet at the financing decision. Demand for the firm's product determines the value of expanding, and demand for the firm's equity determines whether public markets will finance that expansion. This paper studies the point where the two conditions meet.

Strong evidence shows that investor demand moves the prices of outstanding shares and that market valuations affect issuance and investment (Koijen and Yogo, 2019; Baker and Wurgler, 2002; Baker et al., 2003). Those facts do not reveal how investor demand matters when a firm has a separately observed reason to issue. Product market opportunities and financing conditions usually move together, and issuance can respond to valuations, sentiment, or omitted firm news. The missing object is the response of equity financing to a real opportunity measured before the financing decision.

The answer is not obvious in a market shaped by passive investing. Installed indexed ownership is a slow-moving stock of benchmark-linked capital already present in the firm. Recent passive flow pressure is current demand transmitted through positions funds held before the financing window. The installed stock may leave fewer investors willing to submit discretionary, price-contingent orders for a new issue, while recent flow pressure may support short-window absorption. A single passive ownership share combines these economically different states and can conceal opposing financing conditions.

I ask whether investor demand conditions the public equity response to an externally generated customer demand opportunity. I find that it does. Passive inflows do not raise issuance on average. They make issuance more responsive to customer demand. Installed indexed ownership weakens the same response. Passive capital therefore reallocates equity financing toward firms with real opportunities.

Isolating the opportunity from the supplier's equity market is the central design problem. I use growth in federal procurement in the markets served by the supplier's publicly traded customers. For each customer, I construct an innovation from spending growth across the awarding agency and product markets it served in prior quarters, excluding the customer's own awards and fixing exposure shares in advance. Customer relationships disclosed before the procurement quarter carry the shock to suppliers, and suppliers with material direct federal exposure are removed. Under the exclusion restriction, growth in these predetermined government markets changes customer demand without directly changing a supplier-specific financing condition.

I measure two investor states before the financing window opens. Installed indexed ownership is the share of the firm's equity held by benchmark-tracking capital, with fund positions capped at benchmark-prescribed holdings. Recent passive flow pressure maps external mutual fund flows through lagged stock positions and scales the implied demand by lagged market capitalization. The measure captures recent demand transmitted through existing positions, not cash earmarked for a future offering. The joint specification includes matched active pressure, total institutional ownership, predetermined firm controls, and fixed effects for persistent supplier policies and common financing conditions.

The evidence has three parts. First, the procurement innovation creates a real customer demand opportunity and induces suppliers to enter the public equity market. Second, broad firm-quarter tests show that fund ownership growth predicts issuance but instrumented passive inflows do not raise it on average. Third, the same instrumented inflows raise issuance sensitivity to customer demand, while installed indexed ownership weakens that response. Within-opportunity comparisons and financing constraints show where the allocation shifts.

The opportunity appears in operating data before the financing response. A one standard deviation procurement innovation raises the customer's realized order growth by 0.190 log points in the procurement quarter. Transmitted through disclosed customer relationships, the same innovation raises product-proximate supplier sales growth by 6.17 percentage points year over year in the same quarter. The preceding-quarter estimates are near zero, and the sales response is weak outside the product-proximate network. The design therefore identifies customer demand that reaches the supplier's product market rather than a general financing wave.

Suppliers respond by selling new common equity. Over the procurement quarter and the next, a one standard deviation customer innovation raises verified common-equity offering incidence by 2.53 percentage points among product-proximate suppliers and lifts verified issuer proceeds by 2.48 percent of lagged assets. Offering activity in the preceding quarter is close to zero, and the straight-debt estimates are small and imprecise. Under the procurement exclusion restriction, customer demand moves both entry into the public equity market and the amount of capital raised.

The financing response varies with the two investor states. In the joint equation, one standard deviation more installed indexed ownership predicts a 3.41 percentage point smaller customer demand effect on offering incidence in the product-proximate network. A one standard deviation increase in recent passive flow pressure predicts a 0.89 percentage point larger response in the broad network. Each coefficient keeps its predicted sign but is imprecise in the other network.

Product proximity identifies where procurement reaches supplier sales; flow pressure is an issuer-side market condition measured across the broader relationship network. I do not compare coefficient ratios across those scopes.

The positive flow interaction is not a generic tendency for passive inflows to precede issuance. I map the same return-adjusted flows and granular instrument into a CRSP and Compustat panel of 8,806 firms. The instrument strongly moves passive pressure, with a firm-clustered first-stage F above 4,400, but the next-quarter and four-quarter issuance effects are negative and imprecise. The estimate remains imprecise outside finance, with firm fixed effects, and among firms with ten measured passive holders. The average causal effect therefore provides no support for a mechanical issuance response to passive inflows.

The allocation appears when investor demand meets customer demand. The instrumented flow-by-demand interaction is 4.07 percentage points in the product-proximate network and 2.64 points across all links. Holding the observed opportunity distribution fixed, a one standard deviation passive flow shock widens the issuance response between the top and bottom customer-opportunity quartiles by 7.33 and 4.71 percentage points, respectively. The passive-pressure level effect cancels from this comparison. The quantity is a relative allocation contrast across observed opportunities, not a claim about aggregate issuance.

Separately coded commercial offering data closely reproduce the SEC outcomes. Across jointly covered supplier-quarters, the issuance indicators correlate 0.877; among quarters positive in both sources, log proceeds correlate 0.968. Replacing the SEC outcomes with issuer-primary transactions from that source preserves the negative installed-ownership and positive passive-pressure interactions for both issuance and proceeds. Neither pair of independent estimates separates from zero after adjustment for the two state tests, so the exercise validates measurement and economic ordering rather than supplying a second statistically independent result.

Installed ownership also orders financing when the primitive opportunity is held fixed. Comparing suppliers that face the same awarding agency, product class, and procurement quarter, one standard deviation more installed ownership predicts 3.50 percentage points less issuance from a 10.61 percent base rate. This is conditional descriptive ordering among cells in which suppliers make different issuance choices. The flow estimate in the same comparison is positive but imprecise. In the broad network, the demand-by-flow interaction is 1.98 percentage points larger among constrained suppliers than among unconstrained suppliers, with a 95 percent interval of $[0.36, 3.60]$. The stock and flow results separate two margins without requiring the same comparison to identify both.

The investor states carry different identification. Under the procurement exclusion restriction, the customer demand effect is causal and the interactions describe heterogeneity in that effect. Installed indexed ownership remains a predetermined conditioning variable; a rule-implied benchmark instrument preserves the negative sign but is imprecise, and the Russell cutoff has no usable first stage in this sample. Idiosyncratic flows to a stock's largest passive holders provide strong first stages and positive local instrumental-variable estimates in both networks. That interpretation requires the additional restriction that holder-level flow shocks are unrelated to omitted supplier opportunities. The weak-identification-robust sets are unbounded, so the flow estimates remain local and exclusion dependent.

A small participation model explains why the evidence is sharpest at market entry. New-share demand over an offering window has an effective depth, and a fixed issuance cost makes the entry decision sensitive to changes in that depth even when conditional proceeds are noisy. The model permits installed ownership to thin the residual investor book and recent flow pressure to deepen short-window absorption. These economic restrictions organize the empirical tests. The model predicts stronger effects on the decision to issue than on conditional proceeds, matching the relative precision of the two financing margins.

The supporting evidence sharpens the financing interpretation and its limits. Higher installed ownership predicts greater residual-investor absorption of new shares, although offer discounts, offering-window returns, completion time, and withdrawal reveal no clear price mechanism. The customer opportunity raises capital expenditure and asset growth. Installed ownership predicts a smaller asset-growth response while capital expenditure remains at least as strong, a pattern more consistent with a different funding route than with suppressed investment. Sales to the named customer show no state-dependent response, and the negative ownership gradient in those sales predates the shock. Recent flow pressure also has no detectable association with installed ownership growth over the following four quarters.

The central implication is that passive ownership is not a sufficient financing state. A firm with a large installed benchmark-linked base and a firm under recent passive flow pressure can face different issuance conditions even when a conventional ownership share describes both as equally passive. The distinction matters for corporate finance because passive capital reallocates equity financing toward firms with real opportunities, and for asset pricing because firms supply new shares into investor demand. Evaluating the joint equation at observed states, demand-to-issuance passthrough fell by more than half as median installed ownership doubled. This partial-equilibrium calculation shows the economic importance of the state shift without tracing

aggregate issuance.

1.1 Related literature

The paper first contributes to research on production networks. Cohen and Frazzini (2008) show that customer information predicts supplier returns, and Barrot and Sauvagnat (2016) trace how supplier disruptions propagate through production relationships. I use the customer network for a different purpose. An external increase in a customer's order book is measured before the supplier's financing response, so the capital market condition governing transmission enters the design directly. The new evidence shows that investor demand conditions whether a supplier finances when customer demand reaches its product market.

A second strand connects market conditions to corporate financing. Equity valuations influence issuance and investment (Baker and Wurgler, 2002; Baker et al., 2003; Dessaint et al., 2019), Russell 2000 membership shifts small firms toward seasoned equity offerings (Cao et al., 2019), and passive ownership affects governance and other corporate policies (Crane et al., 2016; Heath et al., 2022; Sharma, 2026). Khan et al. (2012) show that buying pressure from high-inflow mutual funds moves prices and predicts seasoned equity offerings over subsequent quarters, so fund demand can forecast corporate share supply. My design adds a separately identified reason to issue. It begins with customer demand, observes the real opportunity before financing, and asks whether investor demand accommodates the resulting equity supply.

The closest firm-supply paper is Sammon and Shim (2026). They show that firms are the main counterparties when passive investors trade and that much of the accommodation occurs through non-primary issuance such as stock-based compensation. That result makes corporate share supply central to passive demand clearing. The pivot here is from accommodation initiated by passive buyers to capital raising initiated by a firm's customer opportunity. I study verified primary offerings and show that installed indexed ownership and recent passive flow pressure are distinct states for the financing response. The papers meet at corporate supply and identify different reasons why firms enter the market.

The last strand ties benchmark-linked demand to demand-system asset pricing. Index assignment shifts passive ownership and stock prices (Appel et al., 2016; Chang et al., 2015), benchmarking creates inelastic stock demand (Pavlova and Sikorskaya, 2023), passive ownership extends beyond funds labeled as index funds (Chinco and Sammon, 2024), and fund flows create temporary demand pressure through existing holdings (Coval and Stafford, 2007; Lou, 2012; Wardlaw, 2020). Holdings-based demand systems discipline investor demand for existing assets

(Koijen and Yogo, 2019), and inelastic-markets and fragility models explain why demand shifts move prices (Gabaix and Koijen, 2023; Haddad et al., 2025; van der Beck, 2026; Greenwood and Thesmar, 2011). I add the firm's decision to create new publicly traded shares. This supply response links investor demand in asset markets to financing when real customer demand arrives.

2 A model of real opportunities and investor depth

A customer-demand shock creates a profitable reason to expand, but expansion may require selling new shares. The relevant investor-demand object is therefore the depth available to absorb newly issued equity during the offering window. Installed indexed ownership and recent passive flow pressure can move that depth in opposite directions.

2.1 The real opportunity

Supplier i receives a customer-demand innovation d_i and chooses equity-financed expansion $q_i \geq 0$. Incremental operating surplus before financing costs is

$$\Pi_i(q_i; d_i) = (m_i + \lambda d_i)q_i - \frac{\alpha}{2}q_i^2, \qquad \lambda > 0, \quad \alpha > 0. \tag{1}$$

The term m_i collects existing opportunities and internal resources. Customer demand changes the profitable scale of expansion, not the firm's share price mechanically.

2.2 Effective offering-window depth

Normalize unaffected share value to one and let Δ_i denote the offer-price concession. If q_i is newly issued equity relative to a fixed pre-offer scale, local investor demand is

$$q_i = B_i(S_i, P_i, L_i)\Delta_i, \qquad \Delta_i = \kappa_i(S_i, P_i, L_i)q_i, \qquad \kappa_i \equiv B_i^{-1}. \tag{2}$$

Depth B_i is the quantity absorbed per unit concession. Installed indexed ownership S_i thins the residual discretionary book, while recent passive flow pressure P_i deepens short-window absorption through lagged holdings. Active pressure L_i is separate. The maintained signs are

$$B_{i,S} < 0, \qquad B_{i,P} > 0, \qquad \text{equivalently} \qquad \kappa_{i,S} > 0, \quad \kappa_{i,P} < 0. \tag{3}$$

Appendix E gives an investor-book microfoundation and states the underwriter-unwind interpretation required for flow pressure to change effective depth.

The inverse-demand schedule does not by itself determine the issuer's total concession cost. Write the effective marginal placement-cost slope as

$$\widetilde{\kappa}_i = \frac{c}{B_i}, \qquad c \in \{1, 2\}, \tag{4}$$

where $c = 1$ integrates the marginal concession and $c = 2$ applies a uniform offer price to every share. The convention changes levels, not signs. With a fixed issuance cost ϕ_i, the supplier chooses

$$\max_{q_i \geq 0} (m_i + \lambda d_i - \tau) q_i - \frac{\alpha + \widetilde{\kappa}_i}{2} q_i^2 - \phi_i. \tag{5}$$

Define $x_i = m_i + \lambda d_i - \tau$ and $b_i = \alpha + \widetilde{\kappa}_i$. For $x_i > 0$,

$$q_i^c = \frac{x_i}{b_i}, \qquad V_i = \frac{x_i^2}{2b_i}, \qquad \omega_i \equiv \frac{\widetilde{\kappa}_i}{\alpha + \widetilde{\kappa}_i} \in (0, 1). \tag{6}$$

The wedge ω_i is the share of marginal adjustment curvature attributable to equity placement. For either investor state $z \in \{S, P\}$,

$$\frac{\partial \ln(\partial q_i^c / \partial d_i)}{\partial z} = -\omega_i \frac{\partial \ln \widetilde{\kappa}_i}{\partial z}. \tag{7}$$

Proposition 1 (Financing passthrough)**.** *Customer demand raises conditional issuance. Its effect is weaker with more installed indexed ownership and stronger under recent passive flow pressure:*

$$\frac{\partial q_i^c}{\partial d_i} = \frac{\lambda}{b_i} > 0, \tag{8}$$

$$\frac{\partial^2 q_i^c}{\partial d_i \partial S_i} = -\frac{\lambda \widetilde{\kappa}_{i,S}}{b_i^2} < 0, \tag{9}$$

$$\frac{\partial^2 q_i^c}{\partial d_i \partial P_i} = -\frac{\lambda \widetilde{\kappa}_{i,P}}{b_i^2} > 0. \tag{10}$$

The supplier issues when $V_i \geq \phi_i$. If fixed costs have distribution H, issuance incidence is $H(V_i)$. A locally uniform density near the entry threshold yields the same comparative statics; Appendix E gives the general-density condition.

Proposition 2 (Market participation)**.** *Under the local fixed-cost condition, the customer-demand effect on issuance incidence decreases with installed indexed ownership and increases with recent*

passive flow pressure.

Fixed costs can make incidence empirically sharper than proceeds: a depth change moves firms near the threshold into or out of the market, while proceeds vary continuously among issuers.

Corollary 3 (Allocation versus average issuance)**.** *Let $I(d, P)$ be issuance incidence and consider two customer opportunities with $d_H > d_L$. If $I_{dP}(d, P) > 0$ over $[d_L, d_H]$, then passive flow pressure widens their issuance gap:*

$$\frac{\partial}{\partial P}\left[I(d_H, P) - I(d_L, P)\right] = \int_{d_L}^{d_H} I_{dP}(u, P)\, du > 0. \tag{11}$$

The sign of average issuance, $\mathbb{E}[I_P(d, P)]$, remains unrestricted.

The corollary separates allocation from expansion of aggregate share supply. Passive pressure can tilt issuance toward firms with stronger customer opportunities even when its average issuance effect is zero. Aggregating that tilt into total issuance, prices, or welfare requires an equilibrium model of investor substitution and firm entry that the reduced-form design does not identify.

2.3 From firm responses to regression coefficients

For outcome Y, let m_i^Y denote firm i's baseline response to customer demand and let $r_{iz}^Y = \partial \ln m_i^Y / \partial z$ denote its proportional response to state z. For conditional quantity, equations (8) and (7) give $m_i^q = \lambda_i / b_i$ and $r_{iz}^q = -\omega_i \partial \ln \widetilde{\kappa}_i / \partial z$.

Proposition 4 (Conditional sufficient statistic)**.** *Fix one state, outcome equation, and network scope. Suppose the firm responses are locally linear in the centered state, both regression coefficients use the same residualization and admit common nonnegative projection weights w_i, and the baseline demand responses satisfy $m_i^Y \geq 0$ with $\sum_i w_i m_i^Y > 0$. Then*

$$\eta_z^{RF} \equiv \frac{\beta_{dz}}{\beta_d} = \frac{\sum_i w_i m_i^Y r_{iz}^Y}{\sum_i w_i m_i^Y}. \tag{12}$$

For offering incidence, suppose the fixed-cost distribution does not shift directly with z; its density must also satisfy $h_i(V_i) > 0$ and $h_i(V_i) + V_i h_i'(V_i) > 0$. An exact mapping from the incidence response to the conditional-quantity depth response further requires a locally uniform density, $h_i'(V_i) = 0$.

Under these conditions, the within-equation ratio is a weighted average of proportional changes in firms' demand-to-financing responses. It is not a level of investor depth or a price

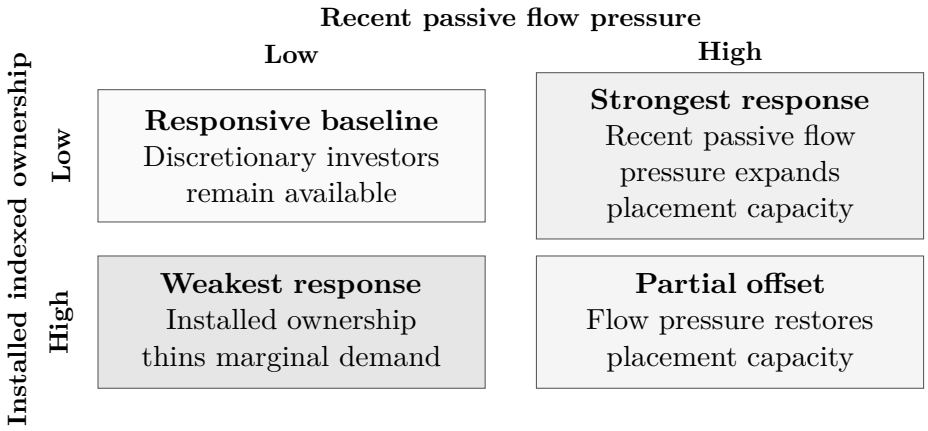


Figure 1. Model prediction for installed indexed ownership and recent passive flow pressure. The model predicts the strongest equity financing response when installed ownership is low and recent flow pressure is high, and the weakest response when installed ownership is high and recent flow pressure is low.

elasticity. Without common weights, local linearity, nonnegative baseline responses, or the stated selection condition, it remains a descriptive ratio of best-linear-projection coefficients. Appendix Section E.3 gives the derivation and the separate incidence-selection corollary.

2.4 Predictions and reduced-form correspondence

Prediction 1 (Real opportunity)**.** *External customer demand raises the supplier's profitable expansion scale and operating activity.*

Prediction 2 (Equity financing)**.** *Customer demand raises common-equity issuance incidence and capital raised.*

Prediction 3 (Installed stock)**.** *The financing and realization responses to customer demand are weaker at higher installed indexed ownership, conditional on total institutional ownership.*

Prediction 4 (Pre-window flow pressure)**.** *The financing and realization responses are stronger under recent passive flow pressure. The passive-minus-active contrast is an empirical comparison, not an imposed sign.*

Prediction 5 (Financing margin)**.** *The investor states can produce sharper effects on issuance incidence than on conditional proceeds.*

Prediction 6 (Opportunity allocation)**.** *Passive flow pressure raises relative issuance for stronger customer opportunities even when its average issuance effect is zero.*

Prediction 7 (Within-opportunity ordering)**.** *Conditional on a common opportunity, financing is ordered by effective depth across suppliers.*

Empirically, d_i is the procurement innovation, S_i is installed indexed ownership, and P_i is recent passive flow pressure; both states are centered and standardized. In the broad-network incidence equation, $\widehat{\eta}_P^{RF} = \hat{\beta}_{dP}/\hat{\beta}_d$ is 58.3 percent, with a bounded 95 percent Fieller interval of $[25.1, 165.4]$ percent. The extended-sample value is 58.6 percent, $[23.7, 160.1]$ percent. The stock ratio has an unbounded Fieller set and stays in coefficient units. Table 1 separates these estimates from their conditional mapping and from objects the design does not identify.

Appendix A.8 reports the corresponding ownership and operating outcomes. The model organizes a state-dependent financing response: product demand is causal under the procurement exclusion restriction, installed ownership is predetermined heterogeneity, and flow pressure has local IV evidence subject to its own exclusion restriction.

Table 1. What the design identifies

Object	Empirical content	Interpretation
Panel A. Estimated		
Joint-equation demand term	3.64 pp, product proximate; 1.53 pp, broad	Demand raises offering incidence under the procurement exclusion restriction.
Installed-stock interaction	-3.41 pp, product proximate, precise; -1.14 pp, broad, imprecise	Predetermined heterogeneity in the demand response; no causal ownership magnitude.
Recent-flow interaction	1.08 pp, product proximate, imprecise; 0.89 pp, broad, precise	Predetermined-state interactions; the separate granular IV preserves the positive cross-effect in both scopes.
Full-universe average flow effect	-0.16 pp next quarter; -0.37 pp over four quarters	Negative, imprecise IV estimates provide no evidence that passive pressure raises average issuance.
Opportunity allocation contrast	7.33 pp, product proximate; 4.71 pp, broad	Relative causal allocation across observed customer-opportunity quartiles under the flow exclusion restriction.
Broad-network flow ratio	0.583; Fieller set $[0.251, 1.654]$	Reportable proportional change in estimated demand-to-incidence passthrough within one equation.
Product-proximate stock ratio	-0.937; Fieller set unbounded and disjoint	Not reportable as a percentage; the installed-ownership result stays in coefficient units.
Panel B. Conditionally mapped		
Coefficient ratio	$\sum_i w_i m_i^Y r_{iz}^Y / \sum_i w_i m_i^Y$	Weighted average only under local linearity, common residualization, common nonnegative projection weights, and nonnegative baseline responses.
Incidence selection	$r_{iz}^I = \chi_i r_{iz}^q$, $\chi_i = 1 + V_i h_i'(V_i)/h_i(V_i)$	With no direct state shift in fixed costs, positive selection preserves the sign. A locally uniform density gives equality with the conditional-quantity response.
Firm-level depth response	$r_{iz}^q = -\omega_i \, \partial \ln \widetilde{\kappa}_i / \partial z$	A conditional correspondence; neither ω_i nor the level of placement curvature is estimated.
Panel C. Not identified		
Level demand objects	B_i, level price elasticity, ω_i, reference issue size	Require price and quantity normalization, a placement convention, and operating curvature.
Aggregation and equilibrium	Aggregate issuance, equilibrium prices, welfare	The allocation contrast holds the opportunity distribution fixed; no general-equilibrium counterfactual is formed.
State transition	Flow pressure to future installed ownership	No detectable conversion at the measured four-quarter horizon; no law of motion is imposed.

Notes: Panel A reports the primary joint offering-incidence equations and their ratio inference. The extended-sample estimates preserve the stock and flow signs; the broad-network flow ratio is 0.586 with bounded Fieller set $[0.237, 1.601]$, while its stock set is unbounded. Panels B and C state the conditions and limits of Proposition 4 and Corollary 5. Every ratio is formed within one equation and network scope. Percentage points are abbreviated pp.

3 Setting, data, and measurement

The empirical setting joins two markets around the same supplier. On the product side, federal procurement changes demand at a customer, itself a publicly traded company, that the supplier names in its filings. On the financing side, the supplier decides whether to place new equity with investors. Four data layers connect those markets: point-in-time customer disclosures, transaction-level federal awards, verified public offerings, and stock-level ownership and fund flows. Every layer is dated by when it was observable, so the customer map and investor states precede the supplier outcome they are used to explain.

3.1 Disclosed customers and federal procurement

Public firms disclose customers that account for at least 10 percent of consolidated revenue. I recover those disclosures from supplier filings and date each relationship by the SEC acceptance date of the filing that contains it. A relationship enters the map only after that date, is measured in the final month before the procurement quarter, and expires when the next annual filing updates the customer list. I cap the final relationship spell at twelve months. Customer identities use strict historical name matches. The supplier exposure retains each disclosed customer-sales weight and leaves the undisclosed sales share unassigned, rather than renormalizing the observed links to sum to one.

The point-in-time map covers 1998 through 2025 and contains 867 publicly traded customers, 2,226 public suppliers, and 130,537 active link-months. The firm-level map contains information that an industry network would miss. Among supplier pairs in the same Fama–French 48 (FF48) industry in the same month, 76.1 percent share no common downstream customer industry. Supplier industry-by-month means explain 30.0 percent of the centered variation in disclosed customer vectors. I retain all disclosed links and separately identify links in which the customer and supplier share an FF48 industry. The operating evidence below determines why this product-proximate network is the principal economic scope.

Federal procurement comes from transaction-level prime-contract records for fiscal years 2008 through 2025. Each record identifies the recipient, transaction date, awarding agency, two-digit Product or Service Code, and obligated amount. Deterministic entity links match 272 publicly traded customers to 295 recipient identifiers and recover 3.1 million transactions representing $1.47 trillion in net obligations.

I use these records to construct a leave-one-customer-out procurement innovation. Let s_{cap,q^-} denote customer c's share of procurement in agency a and product class p over the preceding

twelve quarters, and let g_{apq}^{-c} denote growth in that cell after removing the customer's own awards. The customer shifter is

$$Z_{cq} = \sum_{a,p} s_{cap,q^-} g_{apq}^{-c}. \tag{13}$$

Removing the customer's awards prevents its realized procurement from mechanically generating its own shifter. I winsorize Z_{cq} and residualize it on customer and federal fiscal-quarter effects, together with its one-quarter and four-quarter lags. The supplier innovation maps the residualized customer shocks through relationships observable before quarter q,

$$D_{iq} = \sum_{c} w_{ic,q^-} \widetilde{Z}_{cq}, \tag{14}$$

where w_{ic,q^-} is the disclosed share of supplier i's sales to customer c. The baseline construction requires valid agency-product growth for at least 95 percent of the customer's predetermined exposure. Suppliers whose publicly disclosed direct federal-customer share is at least 10 percent are excluded. Thus D_{iq} captures federal demand reaching a supplier through a named, publicly traded customer, rather than the supplier's own government contracts.

Table 2 reports the support before accounting and financing outcome restrictions. The agency-by-product construction retains 14,994 customer-quarters and 12,933 supplier-quarters. The median supplier-quarter assigns 19.0 percent of sales to customers with valid procurement exposure. The remaining sales share is not implicitly treated as exposed.

3.2 Verified public financing

I construct financing outcomes from SEC offering filings rather than quarterly changes in the book value of equity. Final SEC acceptance timestamps place each completed issuer-primary offering in a federal fiscal quarter. The panel includes an explicit zero for every covered supplier-quarter from 2009Q1 through 2026Q1 and contains 68,310 observations for 990 suppliers. Conventional offerings include common equity, straight debt, preferred stock, convertibles, and units or warrants. Structured-note product pricings are excluded from that family, and ambiguous group transactions are not assigned to the supplier.

The main outcomes isolate common equity. Offering incidence equals one when a supplier completes a common-equity offering during procurement quarter q or the following quarter. The two-quarter window allows a realized customer opportunity to pass through an offering process without treating distant financing as part of the same response. The amount outcome sums

Table 2. Sample, customer map, and procurement support

Statistic	Value
Panel A. Point-in-time disclosed customer map	
Sample period	1998–2025
Publicly traded customers	867
Public suppliers	2,226
Active link-month observations	130,537
Same-industry pairs with no common downstream industry	76.1%
Exposure variance explained by industry-month means	30.0%
Panel B. Expanded procurement match, FY2008–FY2025	
Matched publicly traded customers	272
Recipient UEIs	295
Prime-contract transactions	3,113,704
Net federal obligations	$1.473 trillion
Panel C. Preferred PSC2 demand design	
Customer-quarter observations at 95% coverage	14,994
Supplier-quarter observations at 95% coverage	12,933
Customers	271
Suppliers	939
Varying agency-by-PSC2 shock cells	2,618
Median disclosed customer weight covered	19.0%

Notes: Panel A describes customer relationships dated by SEC filing acceptance. The pair statistic compares suppliers in the same Fama–French 48 industry and month. Panel B reports public customers matched to federal recipient identities. Panel C reports support for the agency-by-PSC2 construction with at least 95 percent valid predetermined shock-share coverage, before accounting-outcome availability restrictions. UEI denotes Unique Entity Identifier.

verified issuer proceeds over the same window and scales them by assets measured before the shock. Amounts are translated into dollars at the latest exchange rate available on or before the filing acceptance date. Using verified transactions separates capital raised from accounting issuance measures that can combine offerings, repurchases, employee compensation, and other share-count changes.

I validate these outcomes against SDC New Issues, a separately coded commercial transaction database. Dated CUSIPs link completed seasoned U.S. public common-equity offerings to CRSP, and the preexisting issuer roster supplies GVKEY. SDC issuer proceeds equal primary shares sold times the offer price. Missing primary-share or price fields are never assigned zero. The SDC layer is used only for the independent measurement test in Appendix Table A1; it does not redefine the SEC outcome used in the main analysis.

3.3 Installed indexed ownership and capital pressure

Installed passive ownership measures the installed stock: the share of a firm's equity capitalization held by capital that tracks a benchmark, using monthly FactSet fund holdings. A fund is assigned to the benchmark its portfolio follows, and a fund-stock position receives credit only up to the smaller of the realized holding and the benchmark-prescribed position. This stock-level minimum prevents an active overweight or an unheld benchmark constituent from being counted as indexed ownership. The state incorporates the holdings-information lag and ends an additional quarter before the earliest financing window. It therefore describes the ownership base already installed before customer demand is measured.

Recent passive flow pressure measures flow-induced demand. I aggregate CRSP mutual-fund share classes to the portfolio, calculate quarterly external flow as the change in assets net of the portfolio's own return, and classify passive status point in time using dated index and ETF flags and explicit index-fund names. I map each portfolio's flow to stocks through holdings reported in the preceding quarter and scale the implied stock demand by lagged market capitalization. After removing the cross-sectional quarter mean, I use the single-quarter pressure innovation ending at the same pre-outcome state date used for installed indexed ownership. The active-pressure measure applies the identical construction to active portfolios. CRSP supplies these flow states; FactSet independently supplies the installed ownership measure.

The flow state is the current-quarter innovation because this horizon captures temporary demand pressure. A four-quarter trailing sum of flow-induced trading does not move contemporaneous returns in this universe, giving -0.07 percentage points per standard deviation against a standard error of 0.28. The single-quarter innovation raises the contemporaneous quarterly return by 0.93 points and gives 2.69 points back over the following eight quarters, which is the temporary price pressure that defines the object (Coval and Stafford, 2007; Lou, 2012). A trailing sum mixes recent pressure with pressure the market has already reversed.

The financing equations also include total 13F ownership and its interaction with customer demand. This separates the composition of institutional ownership from its overall level. Predetermined Compustat controls are log assets, leverage, cash divided by assets, and the prior same-family offering indicator. The supplier-sales outcome used to establish the operating opportunity is year-over-year quarterly sales growth. Samples vary across tables only as the required outcome, capital state, and predetermined controls become available.

4 Empirical design

The empirical design follows the sequence of the economic problem. I first establish that the procurement innovation changes a customer's realized orders and reaches the supplier's sales. I then estimate the supplier's financing response and ask whether that response varies with the installed ownership stock and recent passive flow pressure. All shocks and capital states are standardized within their fixed estimation scopes, so the reported coefficients correspond to a one standard deviation change.

4.1 The procurement opportunity

At the customer level, I estimate the local projection

$$G_{c,q+h} = \mu_c + \tau_q + \beta_h \widetilde{Z}_{cq} + \Gamma_h' X_{c,q^-} + u_{c,q+h}, \qquad h \in \{-1, 0, 1\}, \tag{15}$$

where $G_{c,q+h}$ is positive-obligation growth or the change in net obligations, μ_c and τ_q are customer and federal fiscal-quarter fixed effects, and $\widetilde{Z}_{cq}$ is the leave-one-customer-out innovation in equation (13). Standard errors are clustered by customer and fiscal quarter. The contemporaneous coefficient verifies that the innovation moves the customer's order book; the preceding-quarter coefficient orders the response in event time.

The supplier equation replaces the customer innovation with the relationship-weighted demand measure in equation (14):

$$g^S_{i,q+h} = \mu_i + \lambda_{j(i)q} + \beta_h D_{iq} + \Gamma_h' X_{i,q^-} + \varepsilon_{i,q+h}. \tag{16}$$

Here g^S is year-over-year supplier sales growth, μ_i denotes supplier fixed effects, and $\lambda_{j(i)q}$ denotes supplier-FF48-by-quarter fixed effects. Controls include lagged sales growth and lagged size; inference is clustered by supplier and procurement quarter. I report the product-proximate customer network as the main economic comparison, all disclosed links as the broader comparison, and cross-industry links as the product-distance contrast.

4.2 Financing and investor states

The baseline financing equation is

$$Y_{i,q:q+1} = \mu_i + \lambda_{j(i)q} + \beta D_{iq} + \Gamma' X_{i,q^-} + \varepsilon_{iq}, \tag{17}$$

where Y is either verified common-equity offering incidence or issuer proceeds divided by lagged assets over quarters q and $q+1$. The controls are the prior same-family offering indicator, log assets, leverage, and cash divided by assets. Equation (17) determines whether a customer opportunity reaches the supplier's public financing policy.

The joint state equation estimates the paper's central comparative statics:

$$\begin{aligned} Y_{i,q:q+1} = \mu_i + \lambda_{j(i)q} + \kappa_{b(i)q} + \beta D_{iq} + \theta_S S_{i,q^-} + \theta_P P_{i,q^-} + \theta_A A_{i,q^-} + \theta_O O_{i,q^-} \\ + \delta_S D_{iq} S_{i,q^-} + \delta_P D_{iq} P_{i,q^-} + \delta_A D_{iq} A_{i,q^-} + \delta_O D_{iq} O_{i,q^-} + \Gamma' X_{i,q^-} + \varepsilon_{iq}. \end{aligned} \tag{18}$$

The states are installed indexed ownership (S), recent passive flow pressure (P), matched active pressure (A), and total institutional ownership (O). Formation-size-decile-by-quarter effects $\kappa_{b(i)q}$ enter the joint equation alongside the supplier and industry-quarter effects. The coefficients δ_S and δ_P map directly to the stock and flow comparative statics in Propositions 1 and 2. The contrast $\delta_P - \delta_A$ asks whether accommodation differs between passive and active fund pressure. It is reported directly; the paper's benchmark-linked interpretation rests on the broader pattern because this contrast is imprecise.

4.3 Within-opportunity and constraint ordering

The conditional-ordering equation compares suppliers inside the same primitive procurement opportunity:

$$I_{icq} = \alpha_c + \tau_q + \rho_S S_{i,q^-} + \rho_P P_{i,q^-} + \Gamma' X_{i,q^-} + u_{icq}, \tag{19}$$

where c is an awarding-agency-by-PSC2-by-procurement-quarter cell whose issuance outcome varies across exposed suppliers. Inverse membership weights give each supplier-quarter equal total weight across the cells to which it belongs. The coefficient ρ_S measures whether installed indexed ownership orders financing conditional on the same demand opportunity and on within-cell issuance variation.

The constraint design returns to equation (18) and splits suppliers at the q-minus-1 Hadlock-Pierce median. The stacked equation gives each constraint group its own coefficients and fixed effects. The main contrasts are the more-constrained minus less-constrained coefficients on $D \times P$ and $D \times S$. Exposure-robust inference retains common procurement shock-series scores across the groups, so the contrast is not a comparison of significance stars.

4.4 Buyer composition and subsequent ownership growth

Offering-level equations relate predetermined installed indexed ownership and passive pressure to verified offer terms, completion time, withdrawal, and the passive, active institutional, and residual shares of new issuance. Inference is clustered by issuer. The active-versus-residual absorption decomposition is descriptive.

The transition test separates the pressure and ownership windows:

$$S_{i,t+4} - S_{it} = \mu_i + \tau_t + \beta_P P_{it} + \beta_A A_{it} + \beta_O (O_{i,t+4} - O_{it}) + \varepsilon_{i,t+4}. \tag{20}$$

Passive and active pressure are measured only through t. The predicted sign is $\beta_P > 0$. Stock and state-quarter fixed effects and two-way clustering match the contemporaneous composition equation; only the outcome timing changes.

4.5 Identification and inference

The leave-one-customer-out construction removes the customer's own awards from its procurement innovation. Predetermined customer shares prevent current awards from changing the exposure map, and the supplier construction removes firms with material direct federal exposure. Supplier fixed effects absorb persistent financing policies; supplier-industry-by-quarter effects absorb common product-market and capital-market conditions. The identifying restriction is that growth in the customer's predetermined agency-product markets does not coincide with an omitted supplier-specific opportunity after these controls.

Procurement shocks are shared across customers and suppliers, so conventional observation-level clustering can understate common shock dependence. For the financing coefficients and their interactions, the exposure covariance aggregates regression scores by agency-by-PSC2 series, allowing each primitive procurement shock to affect multiple observations (Adão et al., 2019; Borusyak et al., 2022). Supplier and procurement-quarter two-way clustering provides an alternative variance estimator. The covariance changes uncertainty, not the coefficient, sample, outcome, or specification.

Installed indexed ownership remains a predetermined conditioning state rather than an excluded instrument. Passive pressure uses external fund flows and lagged holdings and is fixed before the outcome window. A capital-accommodation interpretation of δ_P requires that these flows do not respond to an omitted supplier opportunity correlated with D_{iq}. The matched active pressure, total institutional ownership, and their interactions distinguish passive accommodation

from generic institutional demand. Appendix A gives the public-information clock and variable construction in full.

5 Identifying the supplier opportunity

The financing design begins before the supplier raises capital. Federal spending growth in a customer's established procurement markets must first move that customer's realized procurement and then reach the supplier's operations. Both steps appear in the data. The procurement innovation turns sharply in the transaction quarter, and product-proximate suppliers record higher sales in the same quarter. This sequence establishes the real opportunity whose financing response the model seeks to explain.

5.1 From procurement to customer demand

Panel A of Table 3 verifies that the innovation moves realized customer procurement. A one standard deviation innovation raises positive-obligation growth by 0.190 log points in the procurement quarter, or about 21 percent. The single-regressor first-stage F statistic is 12.0. The preceding-quarter coefficient is 0.001. Net obligations produce the same timing, with a contemporaneous response of 0.101 and a smaller, imprecise lead.

5.2 From customers to product-proximate supplier sales

The customer shock reaches suppliers selectively. In Panel B, product-proximate suppliers record 6.17 percentage points higher year-over-year sales growth in the procurement quarter. Their preceding-quarter estimate is -0.82 percentage points. The all-links response is 1.33 percentage points, while the cross-industry estimate is negative and imprecise. Customer demand therefore does not propagate uniformly through every disclosed link. It reaches suppliers most strongly when the named customer and supplier operate in the same broad product industry.

This product-proximity pattern gives the opportunity design its operating content. The product-proximate equation compares suppliers within supplier industry and quarter, so its coefficient does not compare a booming industry with a declining one. The result identifies where externally shifted customer demand enters supplier sales before the paper asks how the equity market accommodates it.

5.3 Established customer exposure

The transmission evidence requires established product market exposure to the customer, but it does not establish that the relationship must remain disclosed at the shock clock. Four falsification tests examine future links, expired links, the pending quarter, and supplier own procurement. The geographic exclusion is disclosed as part of the design, and pretrend evidence comes from the quarter-minus-one lead and the supplier-sales timing evidence. Appendix Table A8 reports these tests. The expired-link estimate is too imprecise to distinguish from zero.

Most measurable expiries exceed the pair's own historical reporting cadence, redisclosure within three years is rare, and when the expired exposure is split by cadence the response concentrates in long-expired pairs, though the split is too imprecise to adjudicate between continuing unreported relationships and durable product-market match capital. The evidence therefore shows transmission through established customer exposure, not that an active disclosure is necessary for propagation.

The design does not require the transaction date to be the first date on which the customer or supplier learns about the underlying demand plan. It estimates the supplier response around a newly realized procurement innovation. Section 4 states the exclusion restriction and the fixed-effects design.

Table 3. From federal procurement to the supplier opportunity

	Quarter −1 (1)	Procurement quarter (2)	Quarter +1 (3)
Panel A. Customer procurement first stage			
Positive procurement growth	0.001	0.190***	0.083
	(0.063)	(0.055)	(0.061)
Net procurement growth	0.030	0.101***	0.025
	(0.023)	(0.025)	(0.024)
Observations	12,889	12,889	12,714
Customers	269	269	269
First-stage F statistic		12.0	
Panel B. Supplier sales response			
All disclosed links	-0.397	1.335**	0.635
	(0.858)	(0.586)	(0.643)
Product-proximate links	-0.824	6.166***	1.681
	(2.844)	(2.057)	(1.856)
Cross-industry links	-0.257	-0.790	0.773
	(0.485)	(0.686)	(0.621)
Observations, all disclosed links	10,776	10,603	10,437
Suppliers, all disclosed links	848	822	813
Observations, product-proximate links	2,832	2,779	2,729
Suppliers, product-proximate links	269	260	258
Observations, cross-industry links	8,078	7,956	7,839
Suppliers, cross-industry links	620	603	593
Unit and time fixed effects	Yes	Yes	Yes
Predetermined supplier controls	Yes	Yes	Yes

Notes: Each coefficient is the response to a one standard deviation agency-by-PSC2 procurement innovation with at least 95 percent valid predetermined shock-share coverage. Panel A outcomes are year-over-year log growth in positive obligations and the year-over-year change in inverse-hyperbolic-sine net obligations. The reported first-stage statistic is for positive procurement growth in the procurement quarter. Customer and federal fiscal-quarter fixed effects are included. Panel B reports percentage-point changes in supplier year-over-year sales growth, winsorized at the 1st and 99th percentiles within outcome quarter. Customer shocks are mapped through disclosed weights active before the procurement quarter. The supplier equations include supplier and supplier-FF48-by-quarter fixed effects, lagged sales growth, and lagged size. Suppliers with material direct federal exposure are excluded. Standard errors in parentheses are clustered by customer and fiscal quarter in Panel A and by supplier and procurement quarter in Panel B. Stars report conventional two-sided significance.

6 Customer opportunities and public equity financing

External customer demand induces suppliers to enter the public equity market, but the response depends on two distinct investor states. Installed indexed ownership weakens the financing response. Recent passive flow pressure strengthens it. The contrast is most precise for the decision to issue, the margin on which the model's fixed financing cost binds.

6.1 The verified financing response

Prediction 2 begins with whether a real customer opportunity reaches the supplier's financing policy. Panel A of Table 4 answers this question using the verified common-equity transactions defined in Section 3. The customer demand innovation raises offering incidence over the shock quarter and the following quarter by 2.53 percentage points in the product-proximate customer network. The broad-network estimate is 1.41 percentage points. Both effects are precisely estimated using the exposure-robust covariance.

The amount raised is economically meaningful. In the product-proximate network, a one standard deviation customer innovation raises common-equity proceeds by 2.48 percent of lagged assets. The leave-one-supplier lower bound is 1.17 percent, a 52.8 percent reduction. The largest supplier accounts for 33.0 percent and the top five for 54.4 percent of the absolute residualized numerator. The all-links estimate is 0.80 percent. These are issuer proceeds from verified transactions rather than accounting changes that can combine repurchases, employee issuance, and valuation effects. Customer demand therefore changes both access to public equity and the capital the supplier raises.

The security composition narrows the interpretation. The response is concentrated in common equity; the corresponding straight-debt estimates are small and imprecise. The contrast is consistent with a financing response specific to common equity. The customer shock is not simply correlated with an economy-wide financing wave that raises every form of external capital.

6.2 Installed ownership and recent flow pressure

Panel B estimates the two investor states jointly. It includes installed indexed ownership, passive pressure, active pressure, and total institutional ownership, together with their required lower order terms and customer-demand interactions. Supplier fixed effects absorb persistent financing policies. Industry by quarter and size decile by quarter effects absorb common financing conditions.

Table 4. Customer demand and public equity financing

	Offering incidence		Proceeds / lagged assets	
	Product-proximate	All links	Product-proximate	All links
	(1)	(2)	(3)	(4)
Panel A. Customer demand and verified common-equity financing				
Customer demand	2.530***	1.414***	2.476***	0.800***
	(0.802)	(0.450)	(0.563)	(0.224)
Panel B. Joint installed-ownership and capital-flow states				
Customer demand	3.643	1.527***	2.203	0.812***
	(3.251; 1.497)	(0.542; 0.566)	(1.192; 0.703)	(0.287; 0.247)
Demand × installed ownership	-3.412***	-1.144	-1.414	-0.158
	(1.069; 1.500)	(0.852; 0.729)	(0.886; 0.777)	(0.328; 0.277)
Demand × passive pressure	1.082	0.890***	0.613	0.295
	(0.776; 0.870)	(0.276; 0.325)	(0.416; 0.529)	(0.237; 0.193)
Demand × active pressure	-0.051	-0.158	1.783	0.331
	(1.087; 1.321)	(0.533; 0.497)	(0.693; 0.924)	(0.229; 0.270)
Passive − active interaction	1.133	1.048	-1.170	-0.036
	(1.531; 1.597)	(0.484; 0.611)	(0.423; 1.070)	(0.188; 0.350)
Observations, Panel A	2,094	7,462	2,080	7,401
Suppliers, Panel A	205	627	205	627
Observations, Panel B	1,718	6,174	1,710	6,154
Suppliers, Panel B	180	547	180	546
Supplier fixed effects, Panels A and B	Yes	Yes	Yes	Yes
FF48 × quarter fixed effects, Panels A and B	Yes	Yes	Yes	Yes
Size decile × quarter fixed effects, Panel A	No	No	No	No
Size decile × quarter fixed effects, Panel B	Yes	Yes	Yes	Yes
Predetermined controls, Panels A and B	Yes	Yes	Yes	Yes

Notes: The table reports the effect of a one standard deviation customer procurement innovation mapped through predetermined disclosed customer weights. Offering incidence coefficients are percentage points; proceeds coefficients are percent of lagged assets. Panel A uses all supplier-quarters with covered SEC outcomes. Panel B requires complete predetermined installed ownership, passive pressure, active pressure, and institutional ownership. It includes every state in levels, its interaction with customer demand, customer demand interacted with total institutional ownership, lagged size, leverage, cash, and the prior outcome. Panel A standard errors use the agency-by-PSC2 exposure-robust covariance. Panel B parentheses report exposure-robust and supplier-by-quarter two-way-clustered standard errors, in that order. When the two covariance estimators disagree at the five percent level, the cell carries no star. Neither covariance distinguishes the passive-minus-active difference from zero. Across single-quarter deletions, the all-links demand-by-passive-pressure incidence coefficient ranges from 0.68 to 1.07 percentage points around the full-sample 0.89; the largest single-cluster change is 23.9 percent of the estimate, and no deletion flips its sign. The product-proximate proceeds estimate falls from 2.48 to 1.17 percent of lagged assets when the most influential supplier is removed, a 52.8 percent reduction. The largest supplier accounts for 33.0 percent and the top five for 54.4 percent of the absolute residualized proceeds numerator. Stars report conventional two-sided significance.

The installed stock and recent passive flow pressure have opposite effects on offering incidence, and each is precisely estimated in one network scope. Within the product-proximate network, a one standard deviation increase in installed indexed ownership is associated with a 3.41 percentage point smaller customer-demand response; the exposure-robust p-value is 0.0015. In the broad network, a one standard deviation increase in recent passive flow pressure is associated with a 0.89 percentage point larger response, separating from zero at the one percent level. Section 8 interprets all four estimates and the additional sample quarters.

The joint equation matters economically. Earlier equations that entered installed indexed ownership and passive pressure separately produced the same opposing signs but smaller incidence coefficients. Both become larger when the other state enters. The joint pattern is consistent with an omitted-state problem in the separate equations: installed ownership and recent flow pressure

partially mask one another.

Appendix Table A1 replaces the SEC outcomes with completed issuer-primary offerings from SDC New Issues. SDC and SEC incidence agree in 99.45 percent of jointly covered supplier-quarters and correlate 0.877. The SDC demand interactions are -1.43 percentage points for installed indexed ownership and 0.62 points for passive pressure, compared with -1.14 and 0.89 in the SEC sample. The corresponding SDC proceeds interactions are -0.56 and 0.46 percent of lagged assets. Every sign survives all single-supplier and single-quarter deletions. The SDC intervals do not distinguish the interactions from zero after adjusting within each two-state family, so this exercise validates the measurement and economic ordering rather than providing a second statistically independent test.

6.3 Why incidence carries the mechanism

The proceeds estimates preserve the stock and flow signs but are less uniform. Installed indexed ownership has a negative interaction in both customer networks, at -1.41 and -0.16 percent of lagged assets, and neither estimate is precise. Passive pressure has a positive interaction in both networks, 0.61 percent in the product-proximate network and 0.30 in the broad one, and neither is precise.

This difference across margins is consistent with Prediction 5. A change in effective offering-window depth moves firms near the fixed issuance cost into or out of the market. Among firms that issue, the amount raised also reflects project scale, internal resources, and the use of proceeds. The extensive margin can therefore reveal the investor state more clearly than conditional offering size. Offering incidence is the lead outcome; proceeds establish that the response carries capital rather than empty registration activity.

6.4 Financing across the two capital states

Figure 2 translates the joint incidence equation into four financing states. At low installed indexed ownership, customer demand induces entry into the equity market under both passive-pressure states in the broad network; the corresponding product-proximate points span zero. Moving to high installed indexed ownership reduces that response. High passive pressure shifts the financing response upward at either ownership state, but it does not erase the larger installed-stock gradient. The figure displays the contemporaneous joint equation and does not imply a transition from one state to the other.

Everything to this point is ordinary least squares with predetermined states. Section 8

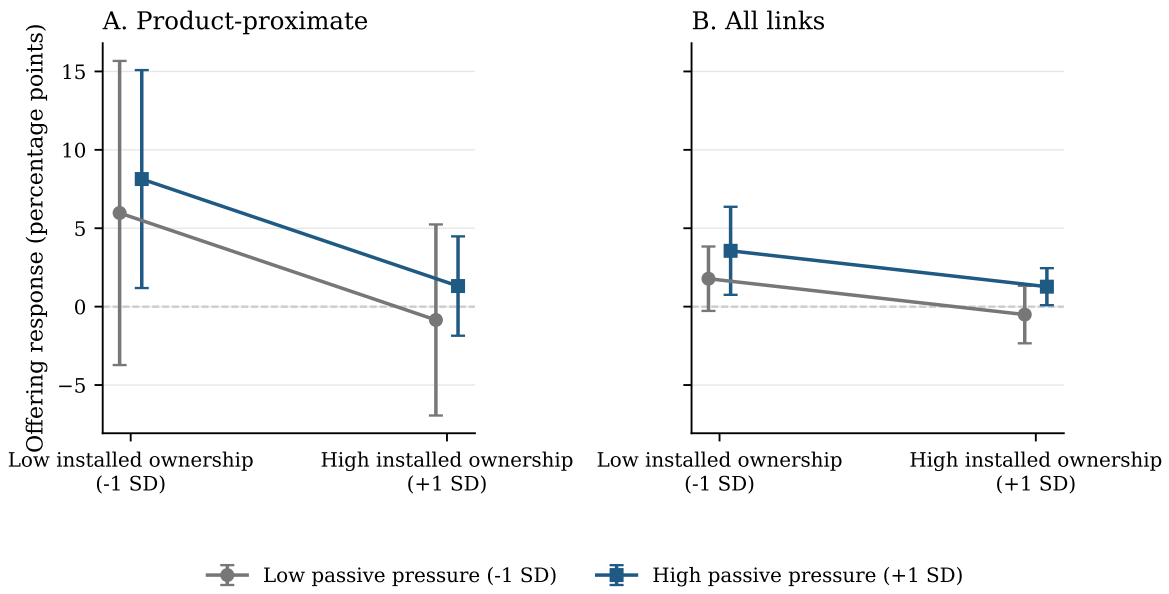


Figure 2. Financing response across installed ownership and capital flow states

Notes: The figure reports the estimated effect of a one standard deviation customer procurement innovation on common equity offering incidence, in percentage points. The product-proximate sample has 1,718 observations and the all-links sample has 6,174. Low and high states are minus and plus one standard deviation of installed ownership and recent passive flow pressure. Active pressure, total institutional ownership, and other standardized states are held at their means. The four points in each panel are linear combinations from the joint offering-incidence equation rather than estimates from subsamples. Bars are 95 percent confidence intervals from the exposure-robust covariance.

asks what survives instrumenting. Passive flow pressure provides local IV evidence subject to exclusion; the installed-ownership interaction preserves its sign but is imprecise.

6.5 Secular passthrough along installed ownership

Installed indexed ownership rose over the sample. Among product-proximate suppliers, the annual cross-sectional median increased from 7.13 percent in 2009 to 14.09 percent in 2025. Evaluating the within-sample coefficient at those two median states implies that the demand-to-issuance passthrough fell from 4.94 to 2.15 percentage points per one standard deviation customer opportunity. The implied passthrough decline is 2.79 percentage points from 2009 to 2025 in the product-proximate scope, with a 95 percent confidence interval of [1.08, 4.50]. It depends only on the interaction and the observed state shift, so the decline is distinguishable from zero even though the annual levels inherit the imprecise demand main effect. The broad network declines by 1.01 points, with an interval of [-0.47, 2.49].

Figure 3 traces the calculation through every sample year. The coefficient is time invariant; only the observed installed-ownership distribution moves. Passive pressure contributes no secular

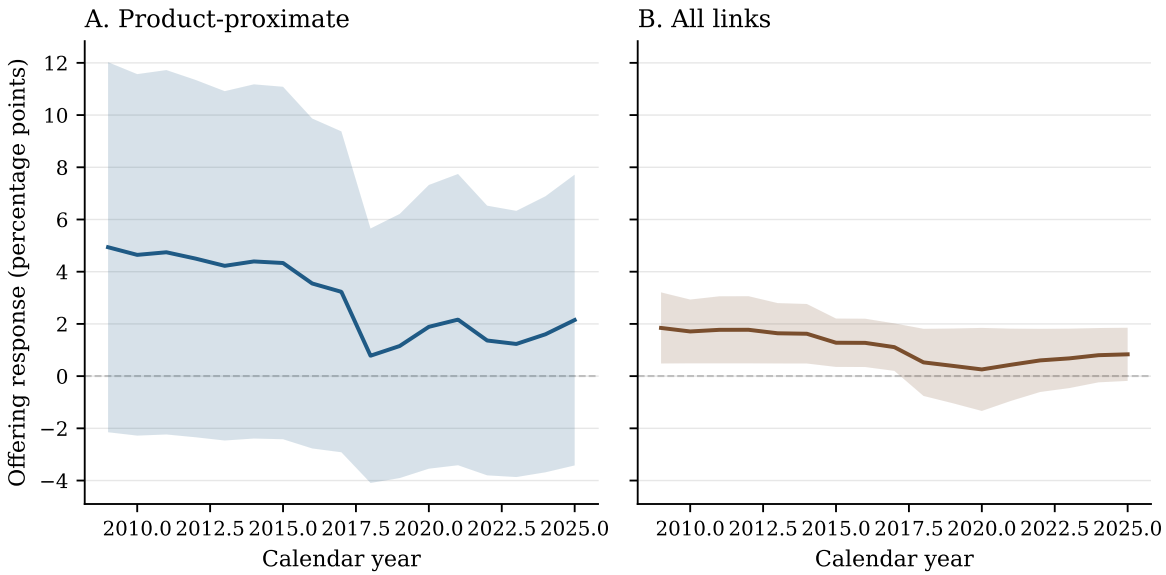


Figure 3. Demand-to-issuance passthrough along the installed-ownership distribution

Notes: The figure evaluates the time-invariant customer-demand coefficient from the joint offering-incidence equation at each calendar year's cross-sectional median standardized installed ownership. The product-proximate sample contains 1,718 supplier-quarter observations; the all-links sample contains 6,174. Observations receive equal weight within network. Passive pressure is demeaned by quarter and contributes no secular term. The paths are linear combinations of the full-sample equation rather than annual or subsample estimates. Shaded regions are 95 percent confidence intervals from the exposure-robust covariance.

term because it is demeaned by quarter. This is a partial-equilibrium reading of the joint equation. It is not an elasticity estimate, an aggregate issuance counterfactual, or evidence that indexing caused the aggregate issuance path.

7 Financing within a common demand opportunity

Prediction 7 holds in the installed-ownership comparison. Among the 6,030 outcome-varying cells, suppliers with more installed indexed ownership issue less often conditional on the same primitive procurement opportunity. A supplier one standard deviation higher in installed ownership is 3.50 percentage points less likely to issue, against a base rate of 10.61 percent. Recent passive flow pressure enters positively but remains imprecisely estimated. This is conditional descriptive ordering among outcome-varying cells.

The unit is a supplier-quarter inside an awarding-agency-by-PSC2-by-procurement-quarter cell. Each cell collects suppliers exposed to growth in the same agency's spending on the same product class in the same quarter. Cell fixed effects therefore absorb the realized procurement innovation and every other feature common to that opportunity. Quarter effects absorb marketwide conditions, and the equation includes the same predetermined supplier controls used in the

Table 5. Financing within the same customer demand opportunity

State	Effect, pp	95% interval	Inference
Installed ownership	-3.50	[-5.61, -1.39]	Negative
Recent passive flow pressure	1.24	[-0.60, 3.08]	Imprecise
Supplier-cell observations			106,951
Outcome-varying cells / eligible cells			6,030 / 36,235
Supplier-quarters / suppliers			5,359 / 555
Quarters / shock series			62 / 999
Weighted mean incidence			10.61%
Effective suppliers, regression / all-cell weights			293.5 / 89.0
Effective shock series, regression / all-cell weights			30.1 / 461.0
Leave-one-supplier range, installed ownership			[-3.83, -3.08]
Leave-one-shock-series range, installed ownership			[-3.78, -3.10]

Notes: The unit is a supplier-quarter inside an awarding-agency-by-PSC2-by-procurement-quarter cell. The comparison uses the 6,030 cells with within-cell issuance variation, drawn from 36,235 eligible cells. Inverse cell-membership weights give each supplier-quarter equal total weight. Both states are standardized. The equation includes cell fixed effects, quarter fixed effects, predetermined controls, and two-way clustering by supplier and procurement shock series. The effective counts report concentration under the regression weights and under weights on all eligible cells. The result is conditional descriptive ordering among outcome-varying cells.

financing design. Because a supplier-quarter can belong to several procurement cells, inverse membership weights give it equal total weight across those cells. The comparison conditions on issuance variation, leaving 6,030 of 36,235 eligible cells. They contribute 5,359 supplier-quarters and 555 suppliers. Inference is two-way clustered by supplier and procurement shock series, and every investor state is measured before the $q : q + 1$ financing window.

The 3.50 point ordering closely matches the 3.41 point interaction in the product-proximate joint equation, but the designs answer different questions. The joint equation estimates how a supplier's response changes as customer demand varies; this comparison holds the realized opportunity fixed. The table reports both concentration measures and the influence ranges. Every leave-one-supplier and leave-one-shock-series refit preserves the negative sign.

Recent passive flow pressure has a positive 1.24 percentage point coefficient, but its interval $[-0.60, 3.08]$ spans zero. Its point estimate remains positive in every influence refit. The flow estimate therefore provides no conditional-ordering result. Installed ownership carries the within-opportunity evidence.

8 Identification

The two investor states do not carry the same evidentiary weight. The flow result provides local IV evidence subject to exclusion. Installed ownership is predetermined heterogeneity; its interpretation is supported by a placebo, a coefficient-stability bound, and a sign-preserving but imprecise instrumental estimate. Table 7 keeps that hierarchy explicit.

The headline interactions are precisely estimated in different network scopes. Installed indexed ownership is negative in the product-proximate network, while recent passive flow pressure is positive in the broad network. The other cell of each pair keeps its sign and loses precision. The extended-sample estimates preserve all four signs. This pattern is economically coherent because product proximity marks where procurement reaches supplier sales, whereas flow pressure is an issuer-side market condition, but it does not identify separate mechanisms. No ratio is formed across network scopes. The product-proximate scope follows directly from the operating evidence. A continuous relevance score built from predetermined relationship features and fit only on sales propagation improves held-out fit by 0.14 percent and collapses to the same-industry indicator (Appendix B.6).

A matched active-fund interaction does not establish passive specificity by itself. In the broad network it is -0.16 percentage points, making the passive-minus-active difference 1.05 points; the difference is imprecisely estimated in both networks. The opposing stock and flow signs and the constraint gradient in Section 9 provide the broader benchmark-linked pattern; the direct contrast alone does not.

8.1 From broad timing to opportunity-specific allocation

Table 6 distinguishes a broad issuance relation from the paper's allocation result. Panel A estimates the broad firm-quarter benchmark. Passive ownership growth predicts 0.29 percentage points more issuance in the next quarter and 1.00 point over four quarters, comparing the top and bottom ownership-growth deciles. Active ownership growth predicts similar increases, so this pattern establishes timing and external validity rather than a passive channel.

Panel B replaces ownership growth with instrumented return-adjusted passive flow pressure in the full CRSP and Compustat universe. Across 8,806 firms, a one standard deviation flow shock changes next-quarter issuance by -0.16 percentage points and four-quarter issuance by -0.37 points. Both estimates are imprecise despite first-stage F statistics above 4,400. Appendix Table A9 reports the full specification set. Nonfinancial firms, firm fixed effects, and a sample requiring ten passive holders produce no stable positive average effect.

Panel C tests Prediction 6 and shows where the causal effect appears. Instrumented passive flow pressure raises the customer-demand slope of issuance by 4.07 percentage points in the product-proximate network and 2.64 points across all links. The observed opportunity distribution translates these interactions into an allocation contrast. A one standard deviation flow shock widens the issuance response between the top and bottom customer-opportunity quartiles by 7.33 and 4.71 percentage points. The passive-pressure level effect is common to the two quartiles and cancels from the difference. The comparison measures how a fixed set of opportunities is reweighted; it does not impose a fixed aggregate issuance quantity or calculate welfare.

Table 6. From fund ownership to opportunity-specific equity issuance

	(1)	(2)
Panel A. Broad ownership-growth benchmark		
	Next quarter	Next four quarters
Passive ownership growth, bottom to top	0.29***	1.00***
	(0.08)	(0.14)
Active ownership growth, bottom to top	0.37***	1.17***
	(0.08)	(0.14)
Passive minus active	-0.08	-0.17
	(0.11)	(0.20)
Observations	316,186	304,845
Firms	9,349	9,251
Panel B. Average causal effect of passive flow pressure		
	Next quarter	Next four quarters
Instrumented passive flow pressure	-0.16	-0.37
	(0.14)	(0.24)
First-stage F	4,499	4,549
Observations	292,091	280,646
Firms	8,806	8,699
Panel C. Causal allocation across customer opportunities		
	Product-proximate	All links
Flow pressure × customer demand	4.07***	2.64**
	(1.40)	(1.11)
Top minus bottom opportunity quartile	7.33***	4.71**
	(2.52)	(1.99)
Weakest effective first-stage F	34.0	27.8
Observations	1,627	5,820
Firms	179	540

Notes: Coefficients are percentage-point changes in seasoned common-equity offering incidence. Panel A estimates a firm-quarter ownership-growth benchmark through 2023. Ownership-change ranks run from 0.05 to 0.95, so the reported coefficients compare the top and bottom deciles. These estimates are descriptive. Panel B instruments one-standard-deviation return-adjusted passive flow pressure with granular shocks to the ten largest passive holders. Specifications include industry-by-quarter effects, active flow pressure, and firm controls; standard errors are clustered by firm. Panel C instruments passive pressure and its interaction with standardized customer demand in the supplier sample. The outcome window is the procurement quarter through the following quarter. Specifications absorb supplier, industry-by-quarter, and size-decile-by-quarter effects and use two-way clustered standard errors. The allocation contrast holds the observed opportunity distribution fixed and multiplies the interaction by the difference in mean standardized demand between the top and bottom opportunity quartiles. The passive-pressure level effect cancels from this comparison. The contrast measures relative allocation across observed opportunities, not aggregate issuance or welfare. Stars report conventional two-sided significance.

8.2 Local IV evidence inside customer opportunities

Among three economically motivated instruments, only granular fund flow shocks provide a usable first stage. Appendix Section B.4 reports the alternatives. The granular instrument aggregates idiosyncratic flow shocks across a stock's ten largest passive holders. Its effective first-stage F statistics are 34.0 and 27.8 under quarter clustering, and 22.8 and 22.0 under the two-way clustering used for the estimates.

Instrumenting recent passive flow pressure, the demand-by-flow interaction is 4.07 percentage points in the product-proximate network and 2.64 in the broad network. Both separate from zero and exceed their least-squares counterparts. The gap is consistent with attenuation or local-effect heterogeneity, but does not distinguish them. These are local IV estimates for stocks whose largest passive holders receive idiosyncratic flows, not population parameters.

Exclusion remains an assumption. Appendix Table A6 tests the instrument against log assets, leverage, cash, prior returns, both investor states, and the procurement innovation under the same absorption. No covariate separates from zero in either network, and the seven-variable Wald statistics lie below their critical value. Most important, the instrument does not load on the procurement innovation ($t = 0.35$ and 0.91). These balance results are supportive, not a proof of exclusion.

8.3 Predetermined heterogeneity in installed ownership

Installed indexed ownership is predetermined, but predetermination is not exogeneity. The rule-implied benchmark position provides a strong first stage for its level and interaction. Two-stage least squares preserves the negative interaction sign but is imprecise: in the product-proximate sample the estimate is -2.38 points, against -3.60 under least squares, with a standard error of 2.01. It moves about one third toward zero and its interval covers zero. The instrument therefore does not identify the magnitude or rule out selection into installed ownership.

The Russell reconstitution cutoff has a weak first stage in this sample. At a 200-rank bandwidth, its first stages are 0.32 for ownership and 0.02 for the interaction; only 40 suppliers ever cross the cutoff. Company-level ranking, the post-2007 banding rule, alternative bandwidths, and index-weight variants do not produce an effective F above 4. The problem is a thin sample around a crowded cutoff, not a first-stage result hidden by the baseline reconstruction. Appendix B.5 reports the variants and separates the design choices in Appel et al. (2016) from the index-weight price design in Chang et al. (2015).

Two descriptive checks narrow the interpretation further. Replacing installed ownership

with non-benchmark 13F ownership leaves a flat, imprecise realization estimate; entering both strengthens the benchmark-linked gradient. Adding the predetermined controls also moves that gradient away from zero. Under Oster's construction, nullification requires selection on unobservables to reverse the direction of selection on observables ($\delta = -1.60$). Neither check establishes exogeneity.

8.4 What the design identifies

The customer-demand effect is causal under the procurement exclusion restriction. The flow result provides local IV evidence subject to a separate exclusion restriction. Installed ownership remains predetermined heterogeneity without an identified causal magnitude. Effective offering-window depth organizes these patterns. Proposition 4 maps the within-equation ratio into a weighted average of firm responses only under its printed aggregation and selection conditions. The paper estimates neither a level price elasticity nor a level of market depth.

Table 7. Instruments for the two investor states

State	Instrument	Scope	Effective F	OLS, pp	IV or reduced form, pp	Inference
Panel A. Installed indexed ownership						
Installed ownership	Prescribed benchmark position	Product-proximate	32.5	-3.60	-2.38 (2.01)	Imprecise
Installed ownership	Prescribed benchmark position	All links	244.2	-1.13	0.61 (0.95)	Imprecise
Installed ownership	Russell reconstitution cutoff	Pooled	0.32			Weak first stage
Panel B. Recent passive flow pressure						
Passive pressure	Granular fund flow shocks	Product-proximate	34.0 / 22.8	0.74	4.07 (1.40)	Local IV
Passive pressure	Granular fund flow shocks	All links	27.8 / 22.0	0.82	2.64 (1.11)	Local IV
Passive pressure	Payout-reinvestment spillover	Product-proximate	1.6			Weak first stage
Passive pressure	Payout-reinvestment spillover	All links	0.0			Weak first stage
Passive pressure	Predetermined-exposure shift-share	Product-proximate	1.3			Weak first stage
Passive pressure	Predetermined-exposure shift-share	All links	0.2			Weak first stage
Observations	Panel A		1,691 / 6,039		Panel B: 1,627 / 5,820	

Notes: Each row reports the customer-demand interaction with the named state in the joint offering-incidence equation. All specifications include supplier, industry-by-quarter, and size-decile-by-quarter effects and the controls described in Section 4; standard errors in parentheses are two-way clustered by supplier and quarter. Each state and its interaction with demand are instrumented, so the system is just identified. Effective F is the Montiel Olea and Pflueger statistic for the weaker endogenous variable. For the granular-flow rows, the two statistics use quarter clustering and supplier-by-quarter clustering. The prescribed benchmark position is index-tracking assets times the firm's weight in the benchmarks that hold it. Granular fund flow shocks remove quarter-by-style and fund effects from fund flows, then aggregate the residuals across the ten largest passive holders. Instruments with an effective F below 4 are reported without a second stage. At the Russell cutoff, the first stages for ownership and its demand interaction range from 0.31 to 2.53 and from 0.02 to 3.74 across bandwidths of 100 to 500 firms; Appendix B.5 gives the full analysis.

9 Who absorbs issuance and where flow matters

Offering-level holdings describe who absorbs new shares, while financing constraints reveal where recent passive flow pressure matters most.

9.1 Buyer composition and deal terms

Higher installed indexed ownership predicts more residual-investor absorption of newly issued shares, 0.221 of the offering per standard deviation, with an interval of $[0.033, 0.409]$. The matching decline in active institutional absorption, 0.157 of the offering, has an interval that spans zero, and passive absorption itself is negative and imprecisely estimated. The decomposition had no directional prediction, and only the residual leg is distinguishable from zero. The result places the marginal buyer outside the measured institutional sectors but does not establish a passive-placement channel.

Offer discounts, offering-window returns, completion times, and withdrawals are imprecisely estimated for both investor states. The median offering completes in two days, and only three withdrawn offerings can be linked exactly to the completed-offering sample. These tests leave the price mechanism unconfirmed while preserving the descriptive buyer-composition fact (Altınkılıç and Hansen, 2000; Corwin, 2003; Gao and Ritter, 2010).

9.2 Passive flow pressure and financing constraints

Passive flow pressure amplifies the demand-linked financing response more among constrained suppliers in the broad customer network. The passive interaction is 1.71 percentage points among more constrained suppliers, with a 95 percent exposure-robust interval of $[0.19, 3.22]$, and -0.27 points among less constrained suppliers. The stacked contrast between them is 1.98 points, with an interval of $[0.36, 3.60]$. Both the constrained level and the gradient are distinguishable from zero using the single-quarter measure. Appendix B.3 shows why that horizon captures temporary demand pressure.

Appendix Table A7 limits the claim. All installed-ownership orderings are imprecise. The product-proximate constrained cell has only 742 observations across 99 suppliers; its saturated linear probability model produces an inadmissible -21.3 percentage point interaction against a 7 percent base rate. The flow gradient is therefore reported only in the broad network, whose constrained cell contains 2,453 observations.

A separate readiness test asks whether the result merely reflects access to an existing issuance

Table 8. Offering terms, execution, and buyer composition

Outcome	State	Effect	95% interval	Inference	Events / issuers / quarters
Panel A. Placement and execution					
Offer discount	Installed ownership	0.005	[-0.025, 0.034]	Imprecise	380 / 160 / 60
Offer discount	Passive pressure	-0.005	[-0.019, 0.008]	Imprecise	380 / 160 / 60
Offering-window return	Installed ownership	0.001	[-0.033, 0.034]	Imprecise	749 / 241 / 60
Offering-window return	Passive pressure	0.002	[-0.016, 0.020]	Imprecise	749 / 241 / 60
Passive absorption	Passive pressure	0.013	[-0.030, 0.056]	Imprecise	476 / 187 / 59
Completion time	Passive pressure	-0.006	[-0.039, 0.027]	Imprecise	467 / 193 / 60
Withdrawal	Passive pressure	0.000	[-0.001, 0.001]	Imprecise	449 / 190 / 60
Panel B. Buyer composition					
Passive absorption	Installed ownership	-0.064	[-0.132, 0.005]	Descriptive	476 / 187 / 59
Active institutional absorption	Installed ownership	-0.157	[-0.332, 0.018]	Descriptive	476 / 187 / 59
Other residual absorption	Installed ownership	0.221	[0.033, 0.409]	Descriptive	476 / 187 / 59

Notes: Panel A reports issuer-clustered estimates. Completion time is log(1 + calendar days); the median offering lasts two days and the ninetieth percentile lasts four. The price sample retains 380 events after excluding par values, dealer concessions, exercise or conversion prices, preferred-security prices, and values carried forward by correction filings. The withdrawal sample contains 639 completed and three withdrawn offerings with exact links; only one withdrawal has complete investor-state and control data. Panel B describes buyer composition outside the passive sector. It provides no evidence for a passive-placement channel.

program. Among suppliers with a shelf already in place, the demand-by-installed-ownership interaction is -3.12 percentage points, but its 95 percent interval spans $[-7.71, 1.47]$. The customer opportunity also has no precise effect on creating a new shelf or at-the-market program. These estimates leave administrative readiness as a possible alternative.

The evidence therefore separates two margins. Installed indexed ownership orders which supplier finances within an opportunity, while recent passive flow pressure concentrates financing among constrained suppliers in the broad network.

10 Investment and the capital account

The capital account supports a financing interpretation without establishing an investment mechanism. The customer opportunity raises capital expenditure and assets, while the investor-state interactions do not move the two outcomes together.

A one standard deviation procurement innovation raises five-quarter capital expenditure by 0.65 percent of assets and asset growth by 3.12 log points among product-proximate suppliers. Installed ownership is associated with 3.04 log points less asset growth, while its capital-expenditure interaction is positive. The flow interactions are unstable across networks and do not survive instrumenting. Table 9 reports the estimates, confidence intervals, and statistical power.

Assets contain the equity raised and the cash it becomes; capital expenditure does not. A smaller balance-sheet response alongside capital spending that does not fall is consistent with a change in how expansion is funded rather than whether it occurs. It does not establish that

Table 9. Customer demand, investor states, and investment

	Product-proximate			All links		
	Estimate	95% interval	80% MDE	Estimate	95% interval	80% MDE
Panel A. Capital expenditure over $[t, t+4]$*, percent of lagged assets*						
Customer demand innovation	0.65 (0.27)	[0.13, 1.17]	0.75	0.11 (0.06)	[0.00, 0.22]	0.16
× installed indexed ownership	0.78 (0.35)	[0.10, 1.45]	0.97	0.17 (0.12)	[-0.07, 0.41]	0.34
× passive flow pressure	-0.19 (0.18)	[-0.54, 0.16]	0.51	-0.12 (0.06)	[-0.23, -0.00]	0.17
Observations		1,555			5,683	
Panel B. Asset growth over $[t, t+4]$*, log points*						
Customer demand innovation	3.12 (1.30)	[0.57, 5.66]	3.64	0.68 (0.56)	[-0.41, 1.77]	1.56
× installed indexed ownership	-3.04 (1.27)	[-5.54, -0.55]	3.57	-0.88 (0.68)	[-2.20, 0.45]	1.89
× passive flow pressure	0.96 (0.64)	[-0.30, 2.23]	1.81	0.54 (0.39)	[-0.23, 1.31]	1.10
Observations		1,574			5,726	
Panel C. Panel A with the flow state instrumented						
× passive flow pressure	0.11 (0.22)	[-0.32, 0.54]	0.61	-0.17 (0.11)	[-0.38, 0.05]	0.30
Effective F, observations		42.2, 1,472			32.1, 5,355	

Notes: The sample and specification match the financing equation. The specification includes supplier, industry-by-quarter, and size-decile-by-quarter fixed effects; lagged log assets, leverage, cash over assets, and a prior-offering indicator. Standard errors are two-way clustered by supplier and quarter. Every specification also carries active institutional pressure and total institutional ownership interacted with demand, so the two reported interactions are specific to the benchmark-linked states. Standard errors in parentheses. Capital expenditure is the year-to-date Compustat series converted to quarterly flows, summed over the five quarters from the procurement quarter and scaled by assets in the quarter before it, winsorized within quarter.

The window requires all five quarters present rather than filling absences. That drops 163 of 1,718 rows in the product-proximate network and 491 of 6,174 in the broad one.

Panel C instruments the flow state and its interaction with the granular fund flow shocks in Table 7, each by its own instrument, and reports the Montiel Olea and Pflueger effective F for the weaker of the two.

Capital expenditure excludes the financing raised, whereas assets mechanically include it. The table therefore reports the two outcomes together to distinguish investment from balance-sheet growth.

installed ownership causally changes investment or the firm's financing choice.

A sources-and-uses decomposition puts the funding-route reading to a direct test. On the same product-proximate sample, the demand-by-ownership interaction is -1.64 percentage points for verified equity proceeds and -2.17 points for total covered financing, and the implied non-equity contrast is 0.59 points; all three intervals contain zero, and the minimum detectable non-equity contrast is 8.6 points. The decomposition establishes neither substitution toward debt and internal cash nor a binding total-financing constraint. The evidence remains state-dependent equity access, while the composition of the response remains unknown at this sample's power.

11 Realization, and where the evidence stops

Access to equity is not realized growth. The relationship-level outcome is the log change in disclosed sales from supplier i to named customer j between the fiscal year covering the procurement window and the preceding year. It isolates the customer relationship the shock acts on, but neither investor state predicts how much of the opportunity becomes realized customer sales.

The relationship sample contains 2,117 observations across 531 suppliers and 65 customers. The passive flow estimate is 0.64 log points, with a 95 percent interval of $[-0.46, 1.75]$. The interval includes economically meaningful effects of either sign, so customer-sales realization remains uncertain.

A pre-shock window changes the interpretation of the stock estimate. Installed ownership predicts -5.6 log points of relationship growth before the opportunity, $[-8.4, -2.9]$, versus -1.2 points on the same rows during the shock window, $[-3.8, 1.3]$. The post-minus-pre difference is therefore 4.4 points, with an interval of $[1.0, 7.8]$, and runs opposite to the prediction. The ownership gradient is a standing relationship property, not a response caused by the procurement opportunity.

Flow pressure has no analogous pre-trend but remains imprecisely estimated. Non-benchmark 13F ownership is also flat and imprecise, while entering it beside installed ownership strengthens the negative installed-ownership estimate. Benchmark linkage distinguishes the standing gradient from institutional ownership generally; the pre-shock result prevents interpreting it as an effect of the opportunity.

Appendix D reports supporting operating outcomes and financing timing. Appendix B explains the limits of other public realization measures. The evidence establishes access to public equity, ordered by installed ownership and recent flow pressure. It does not establish that either

Table 10. The ownership gradient in the named customer relationship

	Estimate	95% interval
Panel A. Log growth in disclosed sales to the named customer, shock window		
Installed indexed ownership	-0.025	[-0.057, 0.007]
	(0.016)	
Passive flow pressure	0.006	[-0.005, 0.017]
	(0.006)	
Observations, suppliers, customers	2,117, 531, 65	
Panel B. The same equation on the window before the shock, paired sample		
Pre-shock window, [base − 1 year, base]	-0.056 (0.014)	[-0.084, -0.029]
Shock window, [base, base + 1 year]	-0.012 (0.013)	[-0.038, 0.013]
Difference, shock window less pre-shock window	0.044 (0.017)	[0.010, 0.078]
Observations, suppliers, customers	1,674, 439, 57	
Panel C. Is it benchmark-linked ownership or institutional ownership?		
Installed indexed ownership, alone	-0.020 (0.012)	[-0.042, 0.003]
Active institutional ownership, alone	0.008 (0.012)	[-0.015, 0.031]
Installed indexed, both entered	-0.025 (0.012)	[-0.049, -0.001]
Active institutional, both entered	0.014 (0.013)	[-0.012, 0.039]

The unit is a supplier–customer–quarter triple inside the procurement opportunity map, restricted to relationships whose disclosed sales are observed in both the outcome year and the prior year. Fixed effects are the customer by agency by product class by quarter cell, so the states are identified among suppliers facing the same customer's opportunity in the same market and quarter. Weights give each outcome observation total weight one. Standard errors in parentheses are two-way clustered by supplier and by agency-by-product-class shock series. Controls are log assets, leverage, and cash over assets at $t-1$, winsorized within quarter.

Panel B moves both disclosure dates back one year, so the growth window closes before the shock quarter, and runs the identical equation on the rows where both windows are defined. The base quarter is at or before the shock quarter in every row of the design. The two windows share the base disclosure and do not overlap, so mean reversion would drive their coefficients to opposite signs rather than the same sign.

Panel C replaces installed indexed ownership with 13F institutional ownership that is not benchmark linked, measured at the same clock as the difference between total institutional ownership and the installed indexed share, and then enters both. This panel conditions on the availability of the 13F measure and so runs on a slightly smaller sample.

Appendix B.2 describes the coverage rule for passive flow pressure. Absent CRSP coverage is treated as missing rather than as zero exposure.

state determines whether suppliers realize the customer demand they win.

12 Conclusion

Passive capital reallocates equity financing toward firms with real opportunities. Federal procurement growth at a named customer raises product-proximate supplier sales and, under the exclusion restriction, induces verified common equity offerings. Idiosyncratic passive inflows do not raise issuance on average across the full firm universe. They make issuance more responsive to customer demand, especially among constrained suppliers. Installed indexed ownership weakens the same response. Within a common procurement opportunity, one standard deviation more installed ownership predicts 3.50 percentage points less issuance from a 10.61 percent base rate.

This distinction changes how passive ownership enters corporate finance. Installed ownership is a stock of benchmark-linked capital that leaves less discretionary depth for a new issue to clear. Passive pressure is recent flow-induced demand mapped through positions funds already hold. The first reduces effective offering-window depth and the second increases it. A single passive ownership share combines these forces and can therefore obscure the equity demand relevant to an issuer. As installed ownership doubled in this sample, the within-sample passthrough from customer demand to issuance fell by more than half. That calculation is partial equilibrium, not an aggregate issuance counterfactual.

The evidence is strongest at market entry. The granular-flow instrument provides local IV evidence for a positive flow interaction in both customer networks, while the stock result rests on a predetermined state, within-opportunity comparisons, and sign-stable but imprecise instrumental estimates. Deal terms reveal no clear price mechanism. An independently coded offering source closely reproduces the SEC transactions and preserves the same stock–flow ordering for issuance and primary proceeds, though its interaction estimates remain imprecise after multiplicity adjustment. Installed ownership compresses asset growth, but capital expenditure does not fall, and the customer-sales tests show no causal operating effect for either state.

Investor demand is therefore associated with more than the price of outstanding shares. It also orders which firms supply new shares when real demand arrives. The relevant state is not passive ownership alone, but the pair of capital already installed and recent flow pressure. That pair connects the demand-system view of asset prices to the corporate decision to finance a real opportunity.

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A Empirical construction and inference

This appendix gives the timing, construction, and inference details behind the main variables.

A.1 Relationship map and public-information clock

Customer relationships enter the point-in-time map on the SEC acceptance date of the filing that names the customer. A relationship is measured in the final month before procurement quarter q and remains active until the next annual filing updates the customer list. The final observed spell is capped at twelve months. Customer identities use strict historical name matching. Disclosed sales weights remain in their original units; the observed customer portfolio is not renormalized to assign the undisclosed share.

The same point-in-time map supplies two descriptive facts used in the paper. Among suppliers in the same Fama–French 48 industry and month, 76.1 percent share no downstream customer industry, and industry-month averages explain 30.0 percent of the centered variation in customer exposures.

All investor states precede the earliest financing outcome. FactSet's passive-ownership measure incorporates the holdings information lag and then ends an additional quarter before procurement quarter q. CRSP fund pressure uses holdings reported in the preceding quarter and is measured for the single quarter ending at the same pre-outcome boundary. Accounting controls and total 13F ownership are likewise measured before the shock.

A.2 Procurement cells and supplier exposure

The procurement innovation uses prime-contract obligations aggregated by customer, awarding agency, two-digit Product or Service Code, and federal fiscal quarter. Customer exposure shares are formed over the preceding twelve quarters. Cell growth removes the focal customer's own awards, and a customer-quarter enters the baseline construction only when valid cell growth covers at least 95 percent of its predetermined exposure. The resulting innovation is winsorized and residualized on customer and fiscal-quarter effects and its one- and four-quarter lags.

Supplier demand maps residualized customer innovations through disclosed customer-sales weights active before quarter q. Suppliers with a disclosed direct federal-customer share of at least 10 percent are removed. Product-proximate and all-links demand measures are constructed separately from their corresponding customer portfolios. The cross-industry measure is the complementary product-distance contrast.

Procurement quarter q is the quarter in which procurement is realized. The design does not treat it as an announcement date or as the first date on which the supplier or market could learn about the award.

A.3 Verified offering outcomes

The SEC event layer uses final filing acceptance timestamps and records an explicit zero in every covered supplier-quarter. The conventional offering family contains common equity, straight debt, preferred stock, convertibles, and units or warrants. Structured-note product pricings are excluded, and ambiguous group transactions are not assigned to the supplier.

The main financing outcomes isolate completed issuer-primary common-equity offerings during quarters q and $q+1$. Incidence equals one for at least one verified transaction. Proceeds are issuer proceeds, summed over the same window and divided by assets measured before the shock. Non-dollar proceeds are translated using the latest exchange rate available on or before the SEC acceptance date. This transaction layer separates capital raised from accounting issuance measures that can combine offerings, repurchases, employee compensation, and valuation changes.

The independent SDC layer begins with the vendor's common-equity security taxonomy. It requires a unique dated CUSIP match to a CRSP common share, overlap with the preexisting supplier roster, a completed U.S. public transaction, and a non-IPO flag. SDC issue dates map directly to the same federal fiscal-quarter clock as the SEC events. The corrected structural intersection contains 234 completed deals, including 175 issuer-primary deals with complete offer prices. This sample supports the supplier-quarter incidence and proceeds comparison in Table A1, but is too small for informative offer-discount or announcement-return tests. SDC filed amounts describe proposed deal size, not unused shelf or at-the-market capacity.

Table A1. Independent measurement of public equity financing

	Offering incidence		Proceeds / lagged assets	
	SEC	SDC	SEC	SDC
Demand × installed ownership	-1.144 (0.852)	-1.432 (0.848)	-0.158 (0.328)	-0.559 (0.365)
Demand × passive pressure	0.890 (0.276)	0.618 (0.465)	0.295 (0.237)	0.461 (0.266)
Observations	6,174	6,181	6,154	6,181
Positive outcome rows	266	194	245	192
Supplier fixed effects	Yes	Yes	Yes	Yes
Industry and size by quarter effects	Yes	Yes	Yes	Yes
Predetermined controls	Yes	Yes	Yes	Yes

Notes: The table compares the established SEC transaction layer with SDC New Issues, an independently coded commercial source. Both columns use completed issuer-primary common-equity offerings over procurement quarters q and $q+1$, the all-links joint-state equation, and the same predetermined states, controls, fixed effects, and exposure-robust covariance. Coefficients are followed by exposure-robust standard errors. Incidence is in percentage points; proceeds are percent of lagged assets. Across 7,248 jointly covered supplier-quarters, incidence agrees in 99.45 percent of rows and correlates 0.877. Among 141 common-positive quarters, log proceeds correlate 0.968; the median SDC-to-SEC proceeds ratio is 0.932. Every displayed SDC interaction keeps its sign under all single-supplier and single-quarter deletions. SDC provides independent measurement of mostly the same economic offerings, not a new economic setting.

A.4 Shelf readiness

To distinguish investor demand from administrative readiness, I classify whether a supplier has a preexisting shelf before procurement quarter q and whether it opens a new shelf or at-the-market program during quarters q through $q+4$. An automated text classifier applies a common taxonomy to multiple readings of each SEC filing. Filing coverage is 80.7 percent in the product-proximate sample and 85.9 percent in the broad sample. The preexisting-shelf test keeps the verified common-equity outcome over $[q, q+1]$; the program-creation test records a new shelf or at-the-market program over $[q, q+4]$.

A.5 Installed ownership and recent passive flow pressure

Installed passive ownership measures the fraction of equity capitalization held by benchmark-tracking capital. Each fund-stock position receives credit only up to the smaller of its realized holding and its benchmark-prescribed position. This stock-level minimum excludes active overweights and benchmark constituents the fund does not hold.

CRSP mutual-fund share classes are aggregated to the portfolio. Quarterly external flow equals the change in total net assets net of the portfolio's own return. A portfolio is classified as passive when at least half of its assets carry a dated CRSP index or ETF flag or when its name explicitly identifies an index strategy. The sample requires domestic-equity orientation, at least

$15 million in beginning assets, twelve months of history, and a complete return and asset chain for both quarters. Flow rates are clipped at -0.90 and 3.00.

Portfolio flows are mapped to stocks through lagged holdings, with positions exceeding beginning portfolio assets removed, and scaled by lagged stock-market capitalization. The stock-level measure is demeaned each quarter, and the single-quarter innovation is used. Passive and active pressure apply the same screens and timing. In the financing sample, both measures are winsorized at the first and 99th percentiles and standardized. Total institutional ownership uses the latest 13F filing whose 45-day availability date precedes the state boundary.

A.6 Fixed effects, controls, and covariance

Customer first-stage equations include customer and federal fiscal-quarter effects and cluster by customer and fiscal quarter. Supplier-sales equations include supplier and supplier-FF48-by-quarter effects, lagged sales growth, and lagged size, with clustering by supplier and procurement quarter. The baseline financing equation includes supplier and supplier-FF48-by-quarter effects. The joint state equation also includes formation-size-decile-by-quarter effects. Financing controls are the prior same-family offering indicator, log assets, leverage, and cash divided by assets. Continuous accounting controls are winsorized within quarter and standardized in the estimation sample.

The financing covariance reconstructs the supplier demand measure from its agency-by-PSC2-by-quarter components. Regression scores are aggregated by the agency-by-PSC2 series through time before the covariance is formed. For interaction coefficients, the same demand components are multiplied by the corresponding predetermined investor state. Supplier and procurement-quarter two-way clustered standard errors provide an alternative variance estimate. Both covariances apply to the same coefficient estimates.

For the passive-flow IV, the on-file subset Anderson–Rubin inversion is unbounded at the paper's clusterings over the evaluated grid: the nonrejection regions reach both endpoints, from -55.93 to 64.07 percentage points in the product-proximate network and from -57.36 to 62.64 points in the broad network. As the hypothesized interaction grows, the null-restricted residual becomes dominated by that endogenous interaction, so the clustered moment variance converges to the variance of the instrument times the interaction rather than the variance of the first-stage residual. Those variances differ by about a factor of twenty because the instrument and interaction share a large common-quarter component that the first-stage residual removes. Inference therefore rests on the local IV point estimate and its cluster-robust covariance, not on a bounded Anderson–

Rubin set. For the weaker endogenous variable, the two-way-clustered effective F statistics are 22.8 and 22.0 in the product-proximate and broad networks; the corresponding quarter-clustered values are 34.0 and 27.8.

A.7 Additional sample quarters

The joint equation ends in FY2025Q1, the last quarter with complete investor-state coverage. An additional estimate includes the three remaining procurement quarters through FY2025Q4. The product-proximate incidence sample rises from 1,718 to 1,784 supplier-quarters, and its positive overlapping issuance windows rise from 120 to 129. The all-links sample rises from 6,174 to 6,304 supplier-quarters and from 266 to 279 positive windows.

Table A2 compares the two samples. The incidence interactions preserve their opposing signs. In the product-proximate network, the installed- ownership interaction moves from -3.41 to -2.55 percentage points. In the broad network, the passive-pressure interaction moves from 0.89 to 0.90 points. The added quarters therefore provide a stability check. The FY2025Q1 sample remains the main specification because it has common investor-state coverage.

Table A2. Joint financing estimates through two sample endpoints

Scope	Sample	Customer demand	$D\times$ installed	$D\times$ passive	Observations
Panel A. Offering incidence					
Product-proximate	Common coverage	3.643 (3.251)	-3.412 (1.069)	1.082 (0.776)	1,718
	Through FY2025Q4	4.334 (2.971)	-2.546 (0.993)	0.730 (0.802)	1,784
All links	Common coverage	1.527 (0.542)	-1.144 (0.852)	0.890 (0.276)	6,174
	Through FY2025Q4	1.541 (0.512)	-0.900 (0.751)	0.903 (0.277)	6,304
Panel B. Proceeds divided by lagged assets					
Product-proximate	Common coverage	2.203 (1.192)	-1.414 (0.886)	0.613 (0.416)	1,710
	Through FY2025Q4	2.491 (1.125)	-0.860 (0.848)	0.392 (0.356)	1,776
All links	Common coverage	0.812 (0.287)	-0.158 (0.328)	0.295 (0.237)	6,154
	Through FY2025Q4	0.777 (0.279)	-0.124 (0.294)	0.297 (0.230)	6,284

Notes: Common coverage ends in FY2025Q1, the last quarter with complete investor-state data. The remaining rows apply the same equation through FY2025Q4. Each cell reports the coefficient followed by its agency-by-PSC2 exposure-robust standard error. Incidence coefficients are percentage points; proceeds coefficients are percent of lagged assets. Customer demand and all ownership and flow states are standardized within sample.

A.8 Subsequent ownership and operating outcomes

The model predicts a positive relation from recent passive flow pressure to future installed ownership,

$$S_{i,t+4} - S_{i,t} = \beta_P P_{it} + \eta_{i,t+4}, \qquad \beta_P > 0. \tag{21}$$

The test measures pressure only through quarter t and FactSet ownership growth from t through $t+4$. Both network estimates are negative and imprecise.

The remaining predictions concern customer revenue, issuer composition, use-of-proceeds language, capital expenditure, and asset growth. Table 10, Table A4, and Table 9 report these estimates. The negative ownership gradient in asset growth is distinguishable from zero. The ownership gradient in differenced customer growth and the two capital-expenditure interactions run in the opposite direction. The remaining estimates are imprecise, with minimum detectable effects larger than their point estimates.

B Additional measurement and identification evidence

This appendix reports supplementary evidence on data coverage, the measurement of passive flow pressure, alternative instruments, and the definition of the product-proximate network.

B.1 Coverage of opportunity-realization measures

Public data provide only limited measures of whether a supplier ultimately serves the customer whose procurement increased. Disclosed customer sales yield the relationship-level outcome in Section 11. Total supplier sales and the intended use of offering proceeds provide the supporting outcomes in Appendix D. Federal subaward reports cover only 552 of 1,401,196 prime awards received by the named customers, while Compustat segments cannot be mapped consistently to individual customers. I therefore do not use federal subawards or segment capital expenditure as realization outcomes.

B.2 Coverage of passive flow pressure

Passive flow pressure is defined only when the stock appears in the security-level data and the fund inputs are available in all four preceding quarters. An unmatched stock is treated as missing, not as receiving zero flow pressure. The resulting state takes 8,648 distinct values across 8,772 supplier-quarter observations. Every estimate in the paper applies this coverage rule.

B.3 The flow horizon

The single-quarter measure captures temporary demand pressure. In the CRSP universe, a four-quarter sum of flow-induced trading changes contemporaneous returns by -0.07 percentage points per standard deviation, with a standard error of 0.28. The single-quarter innovation raises

the contemporaneous quarterly return by 0.93 percentage points and reverses by 2.69 points over the next eight quarters. The return and reversal pattern matches the price-pressure evidence in Coval and Stafford (2007) and Lou (2012). Accumulating four quarters combines current demand with flows whose price effects have already reversed.

Expanding the passive classification to include funds that CRSP ever identifies as indexed raises the classified passive share of eligible fund assets from 55.3 to 59.5 percent in 2024. The broader classification produces similar return and reversal patterns. The paper uses the point-in-time classification based on dated index and ETF flags and explicit index-fund names.

B.4 Alternative flow instruments

I examine three instruments for passive flow pressure. The first uses dividends received on other fund holdings and mechanically reinvested across the portfolio. The second interacts predetermined passive ownership with aggregate passive flow. The third aggregates residual fund flow shocks across a stock's ten largest passive holders, using a size-weighted minus equal-weighted contrast.

The dividend instrument has effective F statistics of 1.6 and 0.04 in the product-proximate and broad networks. The predetermined-exposure instrument has effective F statistics of 1.3 and 0.2. Neither provides a usable first stage. The granular flow instrument has effective F statistics of 34.0 and 27.8 under quarter clustering and 22.8 and 22.0 under two-way clustering. Its instrumented level effects are negative, while its interactions with customer demand are positive. This distinction is inconsistent with passive flow pressure mechanically predicting issuance regardless of the customer opportunity.

The result is insensitive to the number of holders used to construct the granular instrument. Using the five, fifteen, or twenty largest passive holders leaves the effective F above 26 in every specification and all six demand-by-flow interactions positive. The broad-network estimates are 2.55, 2.53, and 2.68 percentage points, compared with 2.64 for the ten-holder construction.

B.5 Russell reconstitution

Russell reconstitution provides little identifying variation in this supplier sample. Across bandwidths of 100, 200, 300, and 500 firms around the Russell 1000/2000 cutoff, first-stage statistics range from 0.31 to 2.53 for installed ownership and from 0.02 to 3.74 for its interaction with customer demand. At a 200-rank bandwidth, only 40 suppliers ever cross the cutoff.

The weak first stage is not caused by suppliers avoiding the cutoff. Their median Russell

rank is 1,501, and 14.1 percent lie within 200 ranks of the boundary. The sample is simply thin around a crowded cutoff. Applying Russell's post-2007 banding rule produces first stages of 0.48 for ownership and 0.01 for the interaction.

Company-level rankings and index-weight instruments lead to the same conclusion. The company-level sample contains 1,185 supplier-years across 162 suppliers at the 200-rank bandwidth. Across three instrument forms and four bandwidths, the largest first-stage statistic is 3.71. The cutoff design therefore cannot identify the ownership interaction in this sample.

B.6 A continuous measure of product proximity

The product-proximate network retains links in which the customer and supplier share a Fama–French 48 industry. I compare this indicator with a continuous weight constructed from all-link exposure, the common-industry indicator, disclosed sales weight, relationship age, and the number of prior disclosures. A cross-validated nonnegative regression fits these weights using supplier sales propagation, without using financing outcomes.

The continuous measure does not improve on the common-industry indicator. Its held-out root mean squared error is 0.38931, compared with 0.38987 for the all-links benchmark, and it performs worse in one of five folds. In every fold, the regression places weight only on the common-industry indicator. The operating data therefore support the binary product-proximity definition used in the paper.

C Installed ownership and flow pressure are distinct states

Recent passive flow pressure and installed indexed ownership are related in the contemporaneous state window but do not collapse into one dynamic variable. The subsequent four-quarter estimates are negative and imprecise.

Four-quarter passive pressure is positively associated with installed indexed ownership over the same window. When pressure is measured only through quarter t and ownership growth runs from t through $t + 4$, the estimates are -0.030 and -0.047 percentage points and both intervals span zero, offering no support for a positive transition. Because CRSP supplies pressure and FactSet supplies ownership, the contemporaneous association is not a same-source mechanical relation.

The states are empirically distinct at the measured horizons. There is no detectable conversion over four quarters, not evidence of no conversion at longer horizons. The paper therefore imposes

Table A3. Passive flow pressure and subsequent installed ownership

	Product-proximate (1)	All links (2)
Panel A. Four-quarter association		
Recent passive flow pressure	0.327**	0.168***
	(0.163)	(0.055)
Active capital pressure	-0.100	0.019
	(0.084)	(0.036)
Change in total 13F ownership	0.524***	0.287***
	(0.178)	(0.067)
Panel B. Subsequent installed ownership growth		
Passive pressure through t	-0.030	-0.047
	(0.156)	(0.044)
Active pressure through t	0.043	0.005
	(0.071)	(0.036)
Future total-IO change	0.546***	0.292***
	(0.195)	(0.068)
Observations	1,231	5,086
Stocks	134	418
State quarters	71	71
Stock fixed effects	Yes	Yes
State-quarter fixed effects	Yes	Yes

Notes: Outcomes are changes in installed passive ownership, in percentage points. Panel A relates pressure and ownership change over the same four-quarter window and is therefore contemporaneous. Panel B measures passive and active pressure only through t, then measures ownership growth from t through $t + 4$. The passive-pressure coefficients are negative and imprecise, contrary to the predicted positive transition. Future total institutional ownership had no directional prediction. Standard errors are clustered by stock and state quarter. Stars report conventional two-sided significance.

no flow-to-stock law of motion.

D Supporting realization and timing evidence

Three further outcomes were built, and Table A4 reports all three with the minimum detectable effect beside each estimate. None separates from zero, and in each case the detectable effect explains why.

Total quarterly sales, in Panel A, gives -0.9 log points on installed ownership with an interval covering zero. Panel B asks whether suppliers win their own federal prime awards in the shocked market. They almost never do: 2.4 percent of supplier–cell rows show any own prime award in the

Table A4. Supporting realization outcomes and statistical power

	Estimate	95% interval	80% MDE
Panel A. Same-market operating realization, log growth in quarterly sales			
Installed indexed ownership	-0.009 (0.010)	[-0.029, 0.011]	0.028
Passive flow pressure	0.015 (0.012)	[-0.008, 0.038]	0.033
Supplier-quarters, suppliers	6,269, 546		
Panel B. Own federal prime awards in the same market, asinh obligations			
Installed indexed ownership	-0.157 (0.223)	[-0.595, 0.281]	0.626
Passive flow pressure	0.610 (0.450)	[-0.273, 1.492]	1.261
Rows, suppliers	7,914, 83		
Panel C. Intended use of proceeds, percentage points			
Demand innovation on explicit operating use	3.0 (2.1)	[-1.1, 7.2]	5.9
	42 events		
Passive pressure on general corporate purposes	-2.9 (4.0)	[-10.8, 5.0]	11.3
	20 events		

No estimate in this table separates from zero, so the minimum detectable effect column shows what the sample can distinguish from zero. Where that threshold is several times the point estimate, the evidence is uninformative about an effect of the estimated size.

Panel A measures activity in a shocked federal market rather than activity with the named customer. The estimate is descriptive.

Panel B is limited by the opportunity map rather than by data. Only 2.4 percent of supplier-cell rows show any own federal prime award in the outcome window, because the cells are the customer's procurement markets and these suppliers are rarely primes in them. The estimand is expansion among suppliers that are themselves federal primes.

Panel C is estimated on events where the issuer has both a live covered customer link and an intended-use section, which is 97 of the 453 events carrying investor-state support. The demand innovation is deliberately absent from the second equation, because the model signs an across-cutoff composition effect and declines to sign the within-firm gradient holding demand fixed.

Table A5. Financing timing and subsequent operating realization

Panel A. Timing of conventional public offerings

	Product-proximate	All links
	Demand effect	Demand effect
Preceding quarter ($q-1$)	-0.009	0.296
	(1.237)	(0.403)
Shock quarter (q)	1.941*	0.914
	(1.157)	(0.556)
Shock through next quarter ($q:q+1$)	2.678***	1.330***
	(0.802)	(0.505)

Panel B. Verified proceeds and subsequent operating outcomes

	Product-proximate			All links		
	Total demand effect	Demand, conditional on proceeds	Proceeds slope	Total demand effect	Demand, conditional on proceeds	Proceeds slope
Forward capex, $q+1:q+4$	0.169	0.192	-0.008	0.075	0.072	0.003
	(0.173)	(0.174)	(0.006)	(0.061)	(0.062)	(0.004)
Observations	1,845	1,845	1,845	6,793	6,793	6,793
Inventory change, $q+2$	0.050	0.062	-0.004	-0.002	-0.007	0.005
	(0.039)	(0.042)	(0.004)	(0.047)	(0.047)	(0.005)
Observations	1,916	1,916	1,916	7,008	7,008	7,008
Sales growth, $q+2$	-0.237	0.209	-0.381	0.110	0.190	-0.171
	(3.051)	(3.278)	(0.322)	(0.831)	(0.847)	(0.234)
Observations	1,889	1,889	1,889	7,051	7,051	7,051
Supplier fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
FF48 × quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Predetermined controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Panel A reports the effect of a one standard deviation customer procurement innovation on conventional issuer-primary public-offering incidence, in percentage points. The preceding-quarter samples contain 2,069 product-proximate and 7,387 all-link observations; the other timing rows contain 2,094 and 7,462 observations. Panel B reports percentage-point operating outcomes. The first demand column is estimated without financing. The second adds verified common-equity issuer proceeds raised over $q:q+1$, scaled by lagged assets. The proceeds slope is the change in the operating outcome, in percentage points, per one percentage point of lagged assets raised. Financing is an observed response, so this slope is descriptive rather than a causal effect of issuance. Demand standard errors use the agency-by-PSC2 exposure covariance; proceeds standard errors are clustered by supplier and shock quarter. Stars report conventional two-sided significance.

outcome window, because the cells are the *customer's* procurement markets and these suppliers are subcontractors and commercial vendors rather than primes in them. The outcome therefore offers little variation for an informative test. Panel C reads intended use of proceeds from the prospectuses themselves; among issuers, a stronger demand innovation raises the probability of explicit operating-use language by 3.0 percentage points, in the predicted direction and imprecise, on 42 events. A validation sample gives the text measure 98 percent precision.

Appendix B explains why federal subawards and segment capital expenditure cannot provide informative relationship-level outcomes.

The financing results are not exposed to the realization pre-trend, and their own timing evidence is what establishes that. Table A5 reports it.

Panel A orders offering incidence around the procurement innovation. In the product-proximate network a one standard deviation innovation moves preceding-quarter incidence by -0.01 percentage points, then 1.94 points in the shock quarter and 2.68 points across the shock and following quarters. The broad network follows the same ordering. Financing appears inside the opportunity window rather than trailing an existing issuance program. This timing distinguishes the financing response from the standing relationship pattern in the realization

outcome.

Panel B asks whether proceeds mark stronger subsequent operating realization on the coarse quarterly outcomes. They do not, in either direction that would be informative. In the product-proximate network the proceeds slopes on forward capital expenditure, inventory adjustment, and sales are all negative; in the broad network the first two are positive and the third negative; all six are imprecise, and conditioning on proceeds leaves the customer-demand coefficients essentially unchanged. The proceeds coefficient is descriptive in any case, because issuance is a corporate response to the opportunity rather than an assigned treatment.

Table A6. Balance of the granular flow instrument on predetermined characteristics

	Product-proximate		All links	
	One at a time	Together	One at a time	Together
Log assets	-0.689 (0.392)	-0.653 (0.395)	-0.128 (0.120)	-0.119 (0.126)
Leverage	-0.016 (0.141)	-0.064 (0.134)	-0.008 (0.035)	0.001 (0.035)
Cash over assets	-0.029 (0.293)	-0.190 (0.297)	-0.008 (0.062)	-0.010 (0.060)
Return, prior quarter	-0.034 (0.067)	-0.051 (0.067)	-0.000 (0.014)	-0.002 (0.014)
Installed indexed ownership	-0.494 (0.253)	-0.473 (0.252)	-0.094 (0.069)	-0.089 (0.070)
Active institutional ownership	0.061 (0.082)	0.037 (0.073)	-0.009 (0.019)	-0.010 (0.019)
Customer demand innovation	0.042 (0.120)	0.062 (0.117)	0.036 (0.040)	0.036 (0.041)
Joint Wald, 7 restrictions	7.50		5.89	
Share of instrument variance explained	2.8%		0.2%	
Observations	1,627		5,819	

Notes: The dependent variable is the standardized granular flow instrument, fund flow residuals net of quarter-by-style and fund effects, aggregated over a stock's ten largest passive holders as a size-weighted minus equal-weighted contrast. Every column absorbs supplier, industry-by-quarter, and size-decile-by-quarter effects, the same absorption the financing equation uses. Standard errors in parentheses are two-way clustered by supplier and quarter. Accounting characteristics are winsorized within quarter and standardized; the lagged return is the supplier's own compounded return over the quarter before the instrument is measured. The joint Wald statistic tests all seven characteristics at once against a chi-square with seven degrees of freedom, whose five percent critical value is 14.07.

No characteristic separates from zero in either network, one at a time or jointly, and the seven variables explain 2.8 and 0.2 percent of the instrument's variance. Installed indexed ownership comes closest in the product-proximate network, at $t = -1.955$ against a critical value of 1.960. The customer demand innovation has t-statistics of 0.35 and 0.91.

The effective F statistics in Table 7 are clustered by quarter, the convention that statistic is normally reported under. At the two-way clustering used for the point estimates the weakest effective F is 22.8 in the product-proximate network and 22.0 in the broad one.

Table A7. Financing constraints and the stock-flow interactions

Scope	Constraint group	Interaction	Effect, pp	95% interval	Inference
All links	Less constrained	Demand × installed	-0.32	[-1.51, 0.87]	Imprecise
All links	More constrained	Demand × installed	-3.35	[-13.59, 6.90]	Imprecise
All links	Less constrained	Demand × passive	-0.27	[-1.14, 0.59]	Imprecise
All links	More constrained	Demand × passive	1.71	[0.19, 3.22]	Positive
Product-proximate	Less constrained	Demand × installed	-0.75	[-5.41, 3.91]	Imprecise
Product-proximate	More constrained	Demand × installed	11.18	[-9.63, 31.98]	Imprecise
Product-proximate	Less constrained	Demand × passive	-2.02	[-4.65, 0.61]	Imprecise
Product-proximate	More constrained	Demand × passive	-21.30	[-34.85, -7.75]	Opposite sign
More-minus-less constrained contrasts					
All links	More minus less	Demand × installed	-3.03	[-13.24, 7.19]	Imprecise
All links	More minus less	Demand × passive	1.98	[0.36, 3.60]	Positive
Product-proximate	More minus less	Demand × installed	11.93	[-8.23, 32.08]	Imprecise
Product-proximate	More minus less	Demand × passive	-19.29	[-32.39, -6.18]	Opposite sign
Observations	All links		6,174	Product-proximate: 1,718	
Suppliers	All links		547	Product-proximate: 180	

Notes: More constrained suppliers have a q-minus-1 Hadlock-Pierce index at or above the sample median. Each group uses the joint offering-incidence equation. The first eight rows use exposure-robust inference within group. The final four rows estimate the two groups together, allowing group-specific coefficients and fixed effects while retaining common procurement shock-series scores. Sample counts refer to each scope before the constraint split. The product-proximate constrained cell contains 742 observations across 99 suppliers and produces a -21.3 percentage point flow interaction against a base issuance rate near 7 percent; the implied probability change lies outside the feasible range, so I report but do not interpret it. The broad-network flow result is the informative constraint comparison.

Table A8. Customer-demand transmission falsifications

Exposure or restriction	Estimate	95% interval	Observations	Interpretation
Active relationship	0.051	[0.014, 0.088]	5,079	Main transmission
Future relationship	-0.034	[-0.106, 0.038]	5,079	Null as predicted
Expired relationship	0.100	[0.025, 0.176]	5,079	Weakens live-disclosure claim
Pending quarter, active exposure	-0.021	[-0.066, 0.024]	5,142	Null as predicted
Supplier own procurement	-0.001	[-0.007, 0.005]	5,079	Null as predicted
Active, excluding own-procurement term	0.051	[0.014, 0.088]	5,079	No common-sample attenuation
Expired minus active	0.049	[-0.033, 0.131]	5,079	Equality not rejected, $p = 0.238$
Expired links by disclosure cadence				
Cadence-consistent expiry	-0.019	[-0.147, 0.108]	5,079	Imprecise
Long relative to cadence	0.072	[0.004, 0.140]	5,079	Positive; mechanism unclear
The geographic exclusion is part of the sample definition, not a separate estimator.				
Pretrend evidence: quarter-minus-one lead and supplier-sales timing evidence.				

Notes: Estimates are changes in supplier year-over-year log sales growth per one standard deviation of exposure. The joint bundle includes supplier and supplier-FF48-by-quarter fixed effects, lagged sales growth, and lagged size; standard errors are clustered by supplier and procurement quarter. The core sample contains 285 suppliers and 84 shock quarters; the pending quarter row contains 284 suppliers and 84 shock quarters. The expired row's largest supplier accounts for 14.7 percent and the top five for 35.0 percent of its absolute residualized numerator. Of 1,796 expired supplier-customer-quarters, 11.8 percent are cadence-consistent, 48.4 percent are long relative to cadence, and 39.8 percent have insufficient pre-expiry history. Redisclosure is rare in every category and does not exceed 6.1 percent. The cadence split is too imprecise to distinguish a continuing unreported relationship from durable product-market match capital.

Table A9. Passive flow pressure and seasoned equity issuance in the full firm universe

Sample or specification	OLS	First-stage F	Reduced form	2SLS	Observations
Panel A. Issuance in the next quarter					
Baseline	-0.06 (0.03)	4,499	-0.03 (0.03)	-0.16 (0.14)	292,091
Without active-pressure control	-0.06 (0.03)	4,492	-0.04 (0.03)	-0.17 (0.14)	292,091
Nonfinancial firms	-0.04 (0.04)	3,361	-0.01 (0.03)	-0.03 (0.15)	232,151
Through 2020	-0.06 (0.04)	5,299	-0.05 (0.03)	-0.20 (0.13)	250,505
At least ten passive holders	-0.03 (0.04)	2,092	0.04 (0.04)	0.20 (0.18)	201,928
Small firms	-0.12 (0.06)	3,106	-0.06 (0.05)	-0.21 (0.17)	146,069
Zero-dividend firms	-0.05 (0.05)	3,270	-0.02 (0.04)	-0.08 (0.16)	190,770
Low-cash firms	0.01 (0.04)	2,522	-0.04 (0.03)	-0.24 (0.18)	146,071
High-leverage firms	0.01 (0.05)	2,114	-0.04 (0.04)	-0.21 (0.19)	146,070
Firm fixed effects	-0.06 (0.03)	4,567	-0.03 (0.03)	-0.15 (0.13)	292,091
Panel B. Issuance in the next four quarters					
Baseline	0.00 (0.07)	4,549	-0.08 (0.05)	-0.37 (0.24)	280,646
Without active-pressure control	0.00 (0.07)	4,542	-0.08 (0.05)	-0.38 (0.24)	280,646
Nonfinancial firms	-0.02 (0.09)	3,384	0.02 (0.06)	0.08 (0.27)	222,635
Through 2020	-0.07 (0.08)	5,299	-0.12 (0.05)	-0.50 (0.23)	250,505
At least ten passive holders	0.03 (0.09)	2,087	0.00 (0.07)	0.02 (0.32)	192,211
Small firms	-0.05 (0.12)	3,113	0.02 (0.08)	0.07 (0.30)	140,346
Zero-dividend firms	0.16 (0.11)	3,288	0.01 (0.07)	0.05 (0.29)	183,010
Low-cash firms	0.03 (0.08)	2,571	-0.18 (0.07)	-0.96 (0.34)	140,348
High-leverage firms	0.12 (0.10)	2,123	-0.11 (0.07)	-0.53 (0.34)	140,347
Firm fixed effects	-0.02 (0.06)	4,655	-0.08 (0.05)	-0.35 (0.22)	280,646

Notes: The sample contains CRSP and Compustat U.S. common stocks from 2003 through 2023. The dependent variable equals one when the firm completes a seasoned issuer-primary common-equity offering during the indicated horizon. Coefficients and standard errors are in percentage points per one-standard-deviation change in passive flow pressure or its granular instrument. Passive pressure applies return-adjusted fund flows to lagged portfolio weights. The granular instrument removes fund and quarter-by-style components from fund flows and aggregates the residuals using a size-weighted-minus-equal-weighted contrast among each stock's ten largest passive holders. The baseline includes active flow pressure, profitability, cash, prior returns, size, book-to-market, leverage, dividends, volatility, and age, with industry-by-quarter effects and firm-clustered standard errors. Each variant changes only the feature named in the first column. The low-cash four-quarter estimate is negative and statistically different from zero; no specification produces a stable positive average effect.

E Investor depth and model derivations

E.1 An investor-book foundation for effective depth

Normalize unaffected value to one. A discretionary investor j with risk tolerance t_j and normally distributed per-share risk σ^2 demands $y_j = t_j\Delta/\sigma^2$ shares at concession Δ. Only investors free to submit price-contingent orders during the offering window belong to this book. One parsimonious aggregate depth is

$$B^A(S, L) = \frac{\bar{T}}{\sigma^2}(1 - S)\{1 + g(S)\} + \eta_L L, \tag{22}$$

where $1 + g(S)$ permits surviving discretionary investors to adjust as indexing grows. Installed ownership reduces this book when

$$g'(S) < \frac{1 + g(S)}{1 - S},$$

an under-offset condition rather than a consequence of the CARA primitives.

Recent passive flow pressure enters as short-window depth $B^P(P)$ with $B^P_P > 0$, and total effective depth is $B = B^A + B^P$. This is an intermediation interpretation: lagged positions exposed to recent flow pressure accelerate absorption while an underwriter places or unwinds the issue. In a purely static clearing where flow pressure shifts only a fixed quantity, it moves entry but does not generate the interior demand-by-flow cross-partial. The empirical sign therefore disciplines the effective short-window depth interpretation; it does not establish cash availability at the opening of the financing window.

E.2 Pricing convention and issuer choice

Market clearing gives the marginal concession $\Delta(q) = q/B$. Under integrated marginal pricing, the variable concession cost is

$$\int_0^q \frac{u}{B}\, du = \frac{q^2}{2B}.$$

Under a uniform offer price it is $q\Delta(q) = q^2/B$. Writing $c = 1$ for the first convention and $c = 2$ for the second yields

$$C(q) = \tau q + \frac{c}{2B}q^2 = \tau q + \frac{\widetilde{\kappa}}{2}q^2, \qquad \widetilde{\kappa} = \frac{c}{B}.$$

The convention changes the level of effective placement curvature but not $\widetilde{\kappa}_S > 0$ or $\widetilde{\kappa}_P < 0$.

Suppress subscripts and set $x = m + \lambda d - \tau$ and $b = \alpha + \widetilde{\kappa}$. Conditional on entry, the objective

before the fixed cost is $xq - bq^2/2$. For $x > 0$, strict concavity gives

$$q^c = \frac{x}{b}, \qquad V = \frac{x^2}{2b}.$$

For $z \in \{S, P\}$,

$$q_d^c = \frac{\lambda}{b}, \qquad q_{dz}^c = -\frac{\lambda \widetilde{\kappa}_z}{b^2}, \qquad V_d = \frac{\lambda x}{b}, \qquad V_{dz} = -\frac{\lambda x \widetilde{\kappa}_z}{b^2}. \tag{23}$$

These derivatives prove Proposition 1. Dividing the quantity cross-partial by q_d^c gives

$$\frac{\partial \ln q_d^c}{\partial z} = -\frac{\widetilde{\kappa}}{\alpha + \widetilde{\kappa}} \frac{\partial \ln \widetilde{\kappa}}{\partial z},$$

which is equation (7).

E.3 Aggregation of local financing responses

Fix one outcome equation, one network scope, and one centered state z. Let $m_i^Y(z)$ be firm i's local response of outcome Y to customer demand. Local linearity around $z = 0$ gives

$$m_i^Y(z) = m_i^Y\{1 + r_{iz}^Y z\} + o(z), \qquad r_{iz}^Y = \left.\frac{\partial \ln m_i^Y(z)}{\partial z}\right|_{z=0}. \tag{24}$$

Suppose the Frisch–Waugh–Lovell projections for the demand term and its state interaction use the same residualization and admit common nonnegative weights w_i. Then their local coefficient representations are

$$\beta_d = \sum_i w_i m_i^Y, \qquad \beta_{dz} = \sum_i w_i m_i^Y r_{iz}^Y. \tag{25}$$

If $m_i^Y \geq 0$ and $\sum_i w_i m_i^Y > 0$, division gives

$$\frac{\beta_{dz}}{\beta_d} = \sum_i \pi_i^Y r_{iz}^Y, \qquad \pi_i^Y = \frac{w_i m_i^Y}{\sum_j w_j m_j^Y} \geq 0, \qquad \sum_i \pi_i^Y = 1. \tag{26}$$

This proves Proposition 4. The result connects the ratio to the regression coefficients rather than to a representative firm, but it is conditional. Different residualized regressors can induce different or negative projection weights, local responses need not be linear, and baseline demand responses need not be nonnegative. When any condition fails, the coefficient ratio is not a convex average of firm-level proportional responses.

E.4 Participation and selection

If the fixed cost ϕ has distribution H and density h, the supplier issues with probability $H(V)$. For either state z,

$$\mathbb{P}_{dz}(I = 1) = h'(V)V_zV_d + h(V)V_{dz}.$$

The identity $V_zV_d = VV_{dz}$ reduces this expression to

$$\mathbb{P}_{dz}(I = 1) = V_{dz}\{h(V) + Vh'(V)\}.$$

A locally uniform density sets $h'(V) = 0$ and gives Proposition 2. More generally, the signed propositions hold where $h(V) + Vh'(V) > 0$. The selection factor is common pointwise across the two states at the same firm and evaluation point. That fact does not make it cancel in ratios of heterogeneous best-linear-projection coefficients, whose implicit weights can differ.

Corollary 5 (Incidence selection)**.** *Suppose H_i does not shift directly with z. Let $m_i^I = \partial\mathbb{P}(I_i = 1)/\partial d_i = h_i(V_i)V_{d,i}$ be the baseline demand-to-incidence response and $r_{iz}^I = \partial \ln m_i^I/\partial z$. Where $h_i(V_i) > 0$,*

$$r_{iz}^I = r_{iz}^q \left\{1 + \frac{V_i h_i'(V_i)}{h_i(V_i)}\right\} \equiv r_{iz}^q \chi_i. \tag{27}$$

If $h_i(V_i) + V_i h_i'(V_i) > 0$, then $\chi_i > 0$ and incidence preserves the conditional-quantity sign. If the density is locally uniform, $h_i'(V_i) = 0$, then $\chi_i = 1$ and the proportional incidence response equals the conditional-quantity depth response pointwise. Under the common-weight conditions of Proposition 4, the incidence coefficient ratio is a weighted average of r_{iz}^I. It is a weighted average of r_{iz}^q only with the additional locally uniform selection restriction.

To verify equation (27), divide $\mathbb{P}_{dz}(I = 1) = V_{dz}\{h(V) + Vh'(V)\}$ by $\mathbb{P}_d(I = 1) = h(V)V_d$ and use $V_z/V = V_{dz}/V_d = q_{dz}^c/q_d^c = r_{iz}^q$. Heterogeneous selection multipliers or differing projection weights prevent pointwise cancellation from identifying a ratio of best-linear-projection coefficients.

E.5 Price elasticity and what a level calibration requires

At reference issue size $\bar{q}$, price is $p = 1 - \bar{q}/B$. The local inverse point elasticity is

$$\iota(\bar{q}) \equiv -\frac{\partial \ln p}{\partial \ln q} = \frac{\bar{q}/B}{1 - \bar{q}/B}. \tag{28}$$

Neither ι nor B is estimated in this paper. A level calibration must normalize issue quantity and unaffected price, choose the integrated or uniform-price convention, discipline operating

curvature α and the wedge $\omega = \widetilde{\kappa}/(\alpha + \widetilde{\kappa})$, select a reference issue size, and impose restrictions that aggregate heterogeneous firm derivatives into the regression estimand.

The centered incidence equation supplies a normalization-free reduced-form ratio within a common specification. Its conditional aggregation and selection requirements are stated in Proposition 4 and Corollary 5. The broad-network flow ratio has a bounded Fieller interval. The product-proximate stock ratio has an unbounded Fieller set and is not reported as a percentage. No ratio combines coefficients from different networks.

E.6 Operating outcomes and a hard-capacity limit

For intuition, desired expansion can be written $q_D(d) = (m + \lambda d)/\alpha$ and market capacity as $q_F(S, P) = \bar{q} - c_S^H S + c_P^H P$, with $c_S^H, c_P^H > 0$. The limit $q^{\text{hard}} = \min\{q_D, q_F\}$ makes the extensive-margin ordering transparent; the smooth placement model replaces its kink with continuous depth. If equity finances later operating activity with loading $\psi_h \geq 0$, the financing signs carry to that outcome only where equity relaxes the relevant constraint. An offering can instead fund liquidity, acquisitions, or balance-sheet repair, so financing does not by itself establish productive realization.