

# Going Overseas: FDI Decisions and Supply-Chain Integration

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**Abstract.** Does outward FDI pull host-country sourcing toward the investing country's suppliers? Linking Chinese investment projects in 161 countries over 2005–2024 to bilateral trade data and firm-to-firm supplier networks, I show that it does, in two measurable senses: host sectors source more from China, and host firms' supplier networks become China-linked. In a matched difference-in-differences design, host-country upstream sectors whose downstream customers receive Chinese investment raise the share of imports sourced from Greater China by 1.4 percentage points, about 9 percent of the mean share. Event-study estimates at the firm level show that investment recipients more than double the share of their suppliers located in Greater China. Their own suppliers also become more connected to China through their buyers and suppliers, with no significant increase in exposure to other foreign suppliers. Relative to peer source countries, China's FDI is also concentrated in host-sector markets where this channel has the most scope. A model in which the state screens outward investment on private profit and home-supplier benefits organizes the three results. Outward FDI can thus work as a channel of supply-chain integration, extending the investing country's supply network beyond the affiliates it owns.

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## 1. INTRODUCTION

Foreign direct investment is usually measured as a movement of capital across borders. A Chinese firm acquires a mine, builds a power plant, finances a port, or enters a manufacturing joint venture abroad, and the transaction is recorded as an investment flow. Yet the economic footprint of such a project can extend well beyond the financial transaction. A large foreign investor brings procurement practices, engineering standards, managerial routines, and business relationships. When the investor is from China, these relationships may connect host-country firms and sectors to a dense set of suppliers, contractors, and customers organized around China.

This possibility is central to contemporary discussion of Chinese firms’ “going overseas.” In Chinese business and policy discussion, *chu hai* has become shorthand for a broader outward-expansion strategy: not only selling abroad or moving final assembly abroad, but building foreign production, logistics, service, financing, and supplier ecosystems that remain linked to China. Similar themes now appear in policy, business, and media discussions of supply-chain realignment, geoeconomic fragmentation, and China’s changing role in intermediate-input trade.<sup>1</sup> These discussions point to a broader question about outward investment in a more policy-managed global economy: when firms invest abroad, do they also redirect sourcing relationships toward the investing country’s supply network?

This question matters beyond China. Governments increasingly use industrial policy, investment screening, and restrictions on cross-border capital and technology flows to influence where firms invest and how supply chains are organized.<sup>2</sup> In such an environment, outward FDI is not only a private capital allocation decision; it can also become a channel through which production networks are redirected across borders.

China offers a useful setting in which to study this channel because outward FDI passes through a managed capital account and a state-mediated regulatory environment. In 2017, official guidance classified overseas investment directions into encouraged, restricted, and prohibited categories; NDRC rules formalized review, filing, and reporting procedures; and SAFE rules governed foreign-exchange registration and outward remit-

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<sup>1</sup>For examples of this broader discussion, see [International Monetary Fund \(2023\)](#) on FDI under geoeconomic fragmentation, [World Trade Organization \(2023\)](#) and [Asian Development Bank et al. \(2023\)](#) on trade fragmentation and supply-chain resilience, [Cheng et al. \(2025\)](#) on FDI, trade finance, and GVC integration, [Devesa, Seong, White, Leung, Birshan, et al. \(2025\)](#) and [Devesa, Seong, White, Leung, Lamanna, et al. \(2026\)](#) on shifting FDI and trade corridors, and [Economist Impact \(2025\)](#) on firms’ supply-chain responses. These sources motivate the question; they are not used as evidence for the paper’s estimates.

<sup>2</sup>On the recent expansion of industrial policy, see [Evenett et al. \(2024\)](#) and [Juhász et al. \(2024\)](#); for Asia-Pacific evidence, see [Arias et al. \(2026\)](#). On investment screening and outward-FDI regulation, see [UNCTAD \(2024\)](#); on broader FDI restrictiveness, see [Organisation for Economic Co-operation and Development \(2025b\)](#).

tance procedures (State Council of the People’s Republic of China, 2017; National Development and Reform Commission, 2017; State Administration of Foreign Exchange, 2009). The paper does not observe approval decisions or claim that each project was chosen to reorganize supply chains. The point is narrower: Chinese outward investment is a policy-conditioned setting in which the supply-network consequences of outward FDI are especially important to measure.

This paper asks whether Chinese FDI deepens host-country integration into China’s supply network. I use the phrase “supply network” literally. At the aggregate level, I ask whether Chinese investment in downstream industries is followed by higher sourcing from Greater China in upstream host-country sectors linked through the production network. At the firm level, I ask whether recipient firms become more connected to suppliers in Greater China and to suppliers that are themselves connected to China through their own buyers or suppliers. The empirical object is therefore not simply the location of Chinese capital, but the reorientation of sourcing relationships around Chinese investment events.

The motivation is closely related to the network view of international trade. In models of heterogeneous firms, differences in market access shape aggregate trade patterns (Melitz, 2003; Bernard, Eaton, et al., 2003). Work on trade and social networks pushes this logic further: firms do not meet all possible counterparties at once, and existing contacts can determine which new trading relationships become feasible (Rauch and Trindade, 2002; Jackson and Rogers, 2007; Chaney, 2014). Chaney’s dynamic network model shows how contacts can propagate market access across firms and locations. The empirical setting here is different, but the central idea is similar: Chinese FDI may be a contact-forming event that exposes recipient firms and host-country sectors to suppliers that would otherwise be harder to find, verify, or contract with.

The empirical strategy follows this chain from investment to sourcing. I first ask whether downstream Chinese investment is followed by more Greater China sourcing in IO-linked upstream sectors. I combine project-level Chinese investment from the AEI China Global Investment Tracker with BACI bilateral trade data and OECD ICIO input-output coefficients (American Enterprise Institute and The Heritage Foundation, 2025; Gaulier and Zignago, 2010; CEPII, 2026; Organisation for Economic Co-operation and Development, 2025a). For each host country, upstream sector, and year, I construct off-diagonal downstream exposure: Chinese investment in downstream sectors weighted by how intensively those sectors use the upstream sector’s output. The exposure measure excludes same-sector Chinese investment by construction. This design is important because the paper is not asking whether Chinese investment and Chinese imports rise in the same industry. It is asking whether Chinese investment downstream shifts sourcing upstream.

I then ask whether the investments China actually makes are concentrated where this

channel should be most valuable for Chinese suppliers. Using the World Bank Group sectoral bilateral FDI database for 2008–2019 (Steenbergen et al., 2022), I compare China with source-country peers that look similar in pre-period outward-FDI size and geographic reach. For each host sector and year, I build a downstream-pull score that is high when the host sector uses upstream inputs that China is well positioned to supply. The score excludes the China-host bilateral dyad when measuring China’s upstream export capability, so it is not mechanically picking up existing China-host trade. This exercise does not recover China’s approval rule: rejected applications and approval files are unobserved. Instead, it asks a simpler question: among the investments that we do observe, is China’s portfolio tilted toward markets where downstream FDI has greater potential to create demand for Chinese upstream suppliers?

Finally, I test the mechanism inside firm networks. I match Chinese investment recipients to firm-level supplier-customer links (FactSet Research Systems Inc., 2025). These data do not report contract values, but they reveal observed business relationships. I use them to ask whether recipient firms’ supplier neighborhoods become more China-linked after the first Chinese investment event. The measures separate direct Greater China suppliers from indirect exposure through suppliers that also sell to Greater China buyers or that themselves source from Greater China. If Chinese investment helps build an overseas supply ecosystem, the evidence should not stop at the recipient’s own Chinese suppliers; it should also appear in the surrounding supplier network.

The aggregate evidence provides the motivating fact. In the preferred matched cohort DiD specification, country-sector pairs exposed to high off-diagonal downstream Chinese investment increase their Greater China import quantity share by 1.44 percentage points. The corresponding value-share effects are also positive, but the timing diagnostics are cleaner for quantity shares. The result is robust to controlling for direct same-sector investment and to dropping country-sector years with direct same-sector Chinese investment. The interpretation is deliberately precise: downstream Chinese investment is followed by a shift in physical sourcing shares toward Greater China in IO-linked upstream sectors.

The allocation result points in the same direction. Relative to its peer sources, China holds more outward FDI in host-sector markets with higher predicted complementarity to Chinese upstream industries. In a PPML specification for outward FDI stock, a one-standard-deviation increase in the downstream-pull score is associated with about 103 percent more expected Chinese FDI stock relative to peers; the coefficient is 0.706, with a standard error of 0.246. Among observations with positive FDI stocks, a log-stock specification gives a similar coefficient of 0.765, with a standard error of 0.277. The estimates barely move when I replace the baseline 2005–2007 ICIO matrix with a fixed 2008–2010 matrix or with rolling lagged ICIO coefficients. I interpret this result

descriptively. It does not show which projects Chinese authorities approved or rejected. It shows that the Chinese outward-FDI portfolio we observe is disproportionately located where downstream investment has greater scope to pull demand toward Chinese suppliers.

The firm-level evidence links that aggregate shift to changes in supplier networks. Treated firms increase their direct Greater China supplier share by about 1.7 to 1.8 percentage points in the first three post-event years. More importantly, their supplier neighborhoods become more China-linked beyond the direct Greater China supplier share. The preferred indirect embedding index, which averages six components standardized to the control pre-period, rises by 0.174 index units in event year +1, 0.212 in event year +2, and 0.213 in event year +3. The upstream tier-2 measure, which asks whether a recipient's suppliers themselves source from Greater China suppliers, rises by 2.5 to 3.5 percentage points over the same window. By contrast, non-Greater-China foreign upstream exposure does not rise significantly. This contrast helps separate China-specific network integration from generic internationalization.

Taken together, the results show that Chinese outward FDI is followed by supply-chain integration, not only ownership expansion. Trade data show whether host-country sourcing moves toward China, but they cannot reveal whether firms become embedded in China-linked supplier neighborhoods. Supplier-network data show relationship changes, but they do not measure aggregate sourcing shares. Combining the two shows both patterns at once: Chinese investment is followed by sector-level sourcing reorientation and by firm-level network embedding. The paper therefore treats outward FDI as a potential supply-chain integration event, not only as a capital-flow outcome, and shows how global sourcing relationships can move beyond ownership boundaries and direct procurement links.

The paper proceeds as follows. Section 2 presents a simple conceptual framework that clarifies how downstream FDI can generate home-country supplier demand and why state screening can tilt outward investment toward markets with stronger supplier-network benefits. Section 3 situates the paper in the related literature. Section 4 describes the data and measurement. Section 5 estimates the aggregate reduced form: whether downstream Chinese investment is followed by higher Greater China import shares in linked upstream sectors, and then documents the complementary allocation pattern of Chinese outward FDI. Section 6 tests the firm-level mechanism using matched supplier-network data. Section 7 concludes. The appendix reports data construction details, reduced-form robustness checks, network measurement details, mechanism diagnostics, and supplier-reorientation evidence.

## 2. CONCEPTUAL FRAMEWORK

The framework has two decision makers, a firm and the state. A firm in the home country wants to invest abroad and cares only about the project's profit. The project also has a side effect that the firm ignores: it pulls sourcing in the host country toward suppliers in the home country. The state decides whether the capital can leave, and it counts both the firm's profit and this home-supplier benefit. It is therefore more likely to let investment out where the home-supplier benefit is large. The firm's side is a standard fixed-cost participation problem. The two additions are the home-supplier benefit and the state's screen, and without them the model is an ordinary outward-FDI decision with none of the predictions below. The application is China, where outward investment passes through state review. The model is not a theory of multinational production or of network formation. Its job is to define what each of the paper's three empirical exercises measures and to show how the three fit together.

### 2.1 Environment

A home-country firm considers a project  $j$  in host country  $h$  and downstream sector  $s$ . The project can be an acquisition, a greenfield plant, a joint venture, or a construction contract, and I call the host firm that receives the investment the recipient. Events happen in order: the firm chooses the project's scale and decides whether to propose it, the state approves or blocks the proposal, an approved project operates, and host firms then adjust where they buy inputs.

Projects differ in how strongly they can pull host sourcing toward home suppliers. I summarize this with the project's pull potential,

$$A_j = \sum_u a_{us} \kappa_u m_{hu}, \quad (1)$$

where  $a_{us}$  is the amount of upstream input  $u$  used per unit of output in downstream sector  $s$ ,  $\kappa_u$  is the home country's export capability in  $u$ , and  $m_{hu}$  is host country  $h$ 's imports of  $u$ . Pull potential is high when the downstream sector uses inputs that the home country exports and that the host country already buys from abroad. Section 5.3 measures  $A_j$  for China as the downstream-pull score.

The model is partial equilibrium. Prices, wages, host import demand  $m_{hu}$ , and home export capability  $\kappa_u$  are fixed, and a project's effect on host sourcing does not feed back into its own profit.

### 2.2 The Firm

The firm decides whether to propose the project and at what scale  $I \geq 0$ . Preparing a proposal (due diligence, filings, and arranging finance) costs  $f \geq 0$ . The state approves

the proposal with probability  $q_j$ , derived below, and an approved project earns profit  $\pi_j(I)$ , a strictly concave function of scale. The firm takes  $q_j$  as given when it chooses scale, because the screen sorts projects by host market and sector rather than by how large the firm makes them. Its expected profit from proposing is therefore  $q_j \pi_j(I) - f$ , which it maximizes at the privately optimal scale  $I_j$ . Let  $\pi_j$  denote profit at that scale. The firm proposes the project if and only if expected profit covers the proposal cost:

$$q_j \pi_j \geq f. \quad (2)$$

A profitable project with a low approval probability may never be proposed, and a higher approval probability lowers  $f/q_j$ , the profit a project must earn before the firm will propose it.<sup>3</sup>

### 2.3 Home-Supplier Benefits

An operating project builds what I call linkage capital: contacts, compatible standards, logistics routes, trade finance, and procurement routines that make it cheaper for host firms to do business with home-country firms. Let  $g(I)$  be the linkage capital built by a project of scale  $I$ , with  $g(0) = 0$  and  $g' > 0$ . Linkage capital changes sourcing in three places, and the data observe all three.

The first is the host country's upstream sectors. Home suppliers sell more input  $u$  in host country  $h$  where the host imports a lot of  $u$ , where the home country can supply it, and where the downstream sector uses it intensively. Summing these extra sales over inputs gives the project's home-supplier benefit,

$$B_j(I) = \sum_u B_{uj}(I), \quad B_{uj}(I) = a_{us} \kappa_u m_{hu} g(I), \quad (3)$$

so that  $B_j(I) = A_j g(I)$ , measured in the same units as profit. As with profit,  $B_j$  without an argument denotes the value at the chosen scale  $I_j$ .

The second is the recipient. It uses all of the linkage capital its project builds, so the share of its suppliers that are home-country firms,  $D_j = D(g(I_j))$ , rises with that capital:  $D' > 0$ .

The third is the recipient's supplier neighborhood. Part of the linkage capital is non-excludable within the host market. Once a project has built contacts, logistics routes, and financing channels, the recipient's suppliers can use them too, and they then buy from and sell to home-country firms more cheaply. Let  $\theta \in [0, 1]$  be the share of linkage

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<sup>3</sup>If the firm instead internalized that a larger project raises its approval probability, because the home-supplier benefit below rises with scale, it would build a larger project than  $I_j$  and be approved more often. The investment tracker records realized projects, not the scales firms considered, so I keep the simpler case.

capital available to them, so that their home linkage is  $N_j = N(\theta g(I_j))$  with  $N' > 0$ . Both  $D$  and  $N$  increase in linkage capital because it lowers the cost of transacting with home-country firms; a sourcing model in which host firms choose suppliers by delivered cost, as in [Antràs, Fort, et al. \(2017\)](#), delivers this. Linkage capital is also specific to the home country. The contacts and routines built around a Chinese project connect host firms to Chinese firms, not to Japanese or German ones, so the recipient's exposure to suppliers from third countries,  $F_j$ , does not depend on  $g$ .

The firm earns  $\pi_j$ , but  $B_j$  goes to home suppliers. This gap between the firm's return and the home country's return gives the state a reason to screen.<sup>4</sup>

## 2.4 The State's Screen

The state values the project at its contribution to home-country surplus: the firm's profit plus home suppliers' extra sales, net of a policy cost  $c_j$  of letting the capital leave, which reflects scarce foreign exchange, host-country risk, or the administrative burden of review. Approval is not fully predictable, because officials have discretion and enforcement is incomplete. I capture this with a noise term  $\varepsilon_j$  whose distribution function is  $Q$ . The state approves the project if its value exceeds the noise, so the approval probability is

$$q_j = Q(W_j), \quad W_j = \pi_j + B_j - c_j, \quad Q' > 0. \quad (4)$$

The firm and the state rank projects differently by  $W_j - \pi_j = B_j - c_j$ . Two projects with the same profit face different approval odds when one brings home suppliers more business or costs the state less to approve. Equations (2) and (4) together give expected realized investment in project  $j$ :

$$\mathbf{1}\{q_j \pi_j \geq f\} q_j I_j. \quad (5)$$

The state does not need to forecast sourcing to run this screen. The benefit depends only on the project's scale and its pull potential, and pull potential can be computed from input-output tables and trade data before the project exists. In China, the screen runs through NDRC review and filing procedures and through SAFE's foreign-exchange registration ([National Development and Reform Commission, 2017](#); [State Administration of Foreign Exchange, 2009](#)). One of the categories that the 2017 guidance on outward investment encourages is investment that drives exports of China's competitive production capacity, high-quality equipment, and technical standards ([State Council of the People's Republic of China, 2017](#)). Equipment and standards that follow a project abroad are

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<sup>4</sup>If the firm captures a share  $\lambda \in [0, 1)$  of  $B_j$ , for example because it owns some of the suppliers, its payoff becomes  $\pi_j + \lambda B_j$  and the gap shrinks to  $(1 - \lambda)B_j$ . Predictions 1 and 2 are unchanged, but Prediction 3 then mixes state screening with the firm's own interest in high-pull markets.

home-supplier benefits in the model's sense.

The model is solved recursively and has a unique solution. Strict concavity pins down  $I_j$  and  $\pi_j$ ; equation (3) gives  $B_j$ ; equation (4) gives  $q_j$ ; equation (2) gives the proposal decision; and equation (5) gives realized investment. The three predictions that follow are comparative statics of these objects, and each rests on one assumption. Prediction 1 needs only  $g' > 0$ . Prediction 2 needs  $\theta > 0$  and home-specific linkage capital. Prediction 3 needs the state to count  $B_j$ . If projects built no linkage capital ( $g \equiv 0$ ), the model would be a standard outward-FDI decision with a screen on profit alone, and none of the three would hold.

## 2.5 Predictions

**Prediction 1** (Sourcing). *Once a project operates, the host country buys more inputs from home suppliers, most in the upstream sectors that the project's downstream sector uses intensively, and the recipient draws a larger share of its suppliers from the home country. Formally, for each upstream sector  $u$ ,*

$$\frac{\partial B_{uj}}{\partial I_j} = a_{us} \kappa_u m_{hu} g'(I_j) > 0, \quad \frac{\partial^2 B_{uj}}{\partial I_j \partial a_{us}} = \kappa_u m_{hu} g'(I_j) > 0, \quad \frac{\partial D_j}{\partial I_j} = D' g'(I_j) > 0.$$

The project builds linkage capital, which lowers the cost of buying from home suppliers, and the response in sector  $u$  scales with  $a_{us}$  because that is how much of the downstream sector's input bill falls on  $u$ . The effect vanishes in sectors the downstream sector does not use ( $a_{us} = 0$ ). Section 5 tests the sector-level part with exposure to downstream Chinese investment weighted by  $a_{us}$ , dropping investment in sector  $u$  itself so that only this input-output channel remains, and Section 6 tests  $\partial D_j / \partial I_j > 0$  with the recipient's direct Greater China supplier share.

**Prediction 2** (Neighborhood). *The recipient's suppliers become more connected to home-country firms, both through their buyers and through their own suppliers, while their links to suppliers from third countries do not change. Formally,*

$$\frac{\partial N_j}{\partial I_j} = \theta N' g'(I_j) > 0 \quad \text{for } \theta > 0, \quad \frac{\partial F_j}{\partial I_j} = 0.$$

Non-excludability lets the recipient's suppliers use the contacts, routes, and financing channels the project built, and home-specificity means those channels lead to home-country firms only. The effect vanishes when linkage capital stays inside the recipient ( $\theta = 0$ ), which is the null hypothesis for the indirect embedding index in Section 6. The same section tests  $\partial F_j / \partial I_j = 0$  with exposure to non-Greater-China foreign suppliers, which should not rise if the response is China-specific rather than a general internationalization of the recipient's network.

**Prediction 3** (Allocation). *Holding private profit and policy cost fixed, a project in a market with higher pull potential is more likely to be approved, so realized investment tilts toward high- $A_j$  markets. Formally,*

$$\frac{\partial q_j}{\partial A_j} = Q'(W_j) g(I_j) > 0, \quad \frac{\partial(f/q_j)}{\partial A_j} < 0,$$

*so expected realized investment in equation (5) is weakly increasing in  $A_j$ . For a source country whose suppliers do not gain from  $A_j$ , both derivatives are zero.*

The state counts home suppliers' extra sales, and those are larger where pull potential is high, so the same private profit clears the screen more often and the firm proposes projects that would not otherwise be worth filing. The effect vanishes when the state ignores the home-supplier benefit, when the project builds no linkage capital ( $g(I_j) = 0$ ), and for any source country whose suppliers do not sell more when host sourcing moves toward China. That last case is the comparison in Section 5.3, which tests whether China's outward FDI stock tilts toward high-pull host-sector markets relative to peer source countries.

The framework also clarifies what the estimates do not show. First, the projects in the data passed the screen, so the effects estimated in Sections 5 and 6 apply to approved projects, not to projects that were blocked or never proposed. Second, the allocation pattern alone cannot separate state screening from the firm's own interest in high-pull markets, since both tilt investment toward high- $A_j$  markets. Third, the model does not say which friction linkage capital relaxes; search, standards, finance, and logistics are all consistent with the evidence.

### 3. RELATED LITERATURE

The framework highlights three empirical objects: outward-FDI allocation, sourcing re-orientation, and supplier-network embedding. Existing work usually studies these objects separately. FDI spillover papers ask how inward FDI affects host-country firms. Global-sourcing papers study how firms choose locations, suppliers, and ownership boundaries. Production-network papers show that buyer-supplier links shape firm and aggregate outcomes. Recent work on geoeconomics and industrial policy studies the strategic restructuring of trade, investment, and supply chains. This paper connects these strands by asking whether Chinese outward FDI is followed by measurable movement of host-country sectors and firms toward China's supply network.

#### 3.1 FDI Spillovers and Supply-Chain Linkages

The closest starting point is the literature on FDI spillovers through supply chains. Early evidence made clear that spillovers are hard to identify: [Aitken and Harrison \(1999\)](#) find

that foreign equity participation in Venezuela is associated with higher productivity in the recipient plants, robustly only for small plants, while foreign investment lowers the productivity of domestically owned plants in the same industry. Later work shifted attention from horizontal spillovers to vertical linkages. Javorcik (2004) shows that foreign entry in downstream sectors is associated with productivity gains among domestic firms in upstream supplying industries. Blalock and Gertler (2008) study technology transfer to local suppliers in Indonesia, Kee (2015) shows that domestic firms can benefit through shared local suppliers of FDI firms, and Alfaro-Ureña et al. (2022) use firm-to-firm transactions from Costa Rica to show large and persistent gains after domestic firms first sell to multinational corporations.

This paper keeps the vertical-linkage insight but changes the direction of the question. The classic spillover question asks whether inward FDI improves host-country firms through technology, demand, or supplier upgrading. I ask whether outward FDI from the source country changes host-country sourcing toward that source country. The aggregate evidence studies supplier industries in host economies rather than productivity spillovers within the host alone. The firm-level evidence then asks whether recipients and their supplier neighborhoods become more China-linked after investment. The outcome is source-country supply-chain integration, not only host-country productivity.

### 3.2 Global Sourcing, Firm Boundaries, and Value Chains

Research on global sourcing and firm boundaries provides the economic logic for why downstream investment can matter for upstream suppliers. Models of heterogeneous firms explain why only the most productive firms serve foreign markets through exporting or multinational production (Helpman et al., 2004). Global-sourcing models show that the choice of one source country affects the value of sourcing from others because input choices interact through the firm's cost function (Antràs, Fort, et al., 2017). A related firm-boundary literature studies which stages are integrated inside multinational firms. Antràs and Chor (2013) develop a property-rights model in which optimal ownership depends on the position of a stage in the value chain, and Alfaro, Antràs, et al. (2019) bring this logic to firm-level evidence on integrated and non-integrated inputs across countries. At the macro level, Antràs and de Gortari (2020) show that the geography of GVCs depends not only on the cost of each stage, but also on its proximity to upstream and downstream stages. Antràs and Chor (2022) survey this broader literature and emphasize the complementarity between input-output approaches and micro evidence on firms.

My empirical exercise studies an adjustment that this literature makes economically salient but that is difficult to observe directly: realized supplier links after an investment event. The question is not only where a multinational locates a stage or which inputs it

owns. It is whether downstream Chinese FDI is followed by new sourcing patterns among host-country firms and sectors. The sector-level design uses input-output structure to define which upstream industries are exposed to Chinese investment in their downstream customers. The firm-level design then observes whether supplier relationships around investment recipients move toward China-linked counterparties.

### 3.3 Production Networks and Relationship Formation

A third strand of work studies how production relationships form and why they matter. Evidence on trading networks and models of contact-based network formation emphasize that firms meet potential counterparties through existing contacts, so relationship formation can shape aggregate trade patterns (Rauch and Trindade, 2002; Jackson and Rogers, 2007; Chaney, 2014). Firm-to-firm evidence shows that these links matter in practice. Atalay et al. (2014) show that vertical ownership in the United States is not primarily associated with large intrafirm shipments of physical goods, pointing to the importance of intangible coordination within production chains. Bernard, Moxnes, et al. (2019) use Japanese buyer-supplier data to show that lower search costs create new buyer-seller links and improve firm performance. Rachapalli (2024) provides related evidence that vertical linkages across products are associated with improvements in comparative advantage along the production network.

I treat Chinese FDI as an event around which such relationships can reorganize. The relevant object is not only the recipient's direct supplier list. Supply-chain integration can also appear through the recipient's supplier neighborhood: suppliers that sell to China-linked buyers, suppliers that source from Greater China, and two-hop paths that make the local network more China-linked. For this reason, the firm-level analysis separates direct Greater China supplier shares from indirect embedding measures that do not include the direct Greater China supplier share.

### 3.4 Geoeconomics, Industrial Policy, and Supply-Chain Strategy

Finally, the paper speaks to the economics of geoeconomic fragmentation, industrial policy, and strategic supply chains. Mohr and Trebesch (2025) survey geoeconomics as a field linking economic instruments to geopolitical conflict, fragmentation, coercion, and risk. Clayton et al. (2026) formalize geoeconomic power as the use of economic strength from trade and financial relationships to influence foreign entities and the global equilibrium. Related empirical work shows that firms respond to supply-chain risk by changing supplier composition and vertical integration (Ersahin et al., 2024). In the China context, Garred and Yuan (2025) show that relocation away from China can preserve indirect China-linked supply chains through third-country production. Recent macro evidence likewise documents reorganization of trade and investment relationships along

geopolitical lines (Alfaro and Chor, 2023; Gopinath et al., 2025).

The paper also relates to industrial-policy research that puts production networks at the center of policy design. Liu (2019) shows that input-output linkages shape the social value of sectoral interventions, with upstream sectors playing a distinctive role when distortions propagate through production networks. Evidence on Chinese industrial policy shows that state intervention can reallocate production across countries and reshape global market structure (Kalouptsi, 2018; Barwick et al., 2025). My claim is narrower. I do not infer a policy motive from observed investment, nor do I isolate a single friction such as standards, finance, or trust. I document one concrete channel through which outward FDI can matter in a more geoeconomic world: host-country sourcing and supplier-network exposure move toward the investing country’s supply network.

## 4. DATA AND MEASUREMENT

The empirical analysis combines Chinese investment events, bilateral trade flows, input-output linkages, sectoral FDI stocks, and firm-level supplier-customer networks. The first three sources support the aggregate country-sector exercise. Sectoral FDI stocks support the allocation exercise. The firm-level network data support the mechanism test.

### 4.1 Chinese Investment

The investment data come from the AEI China Global Investment Tracker (CGIT) (American Enterprise Institute and The Heritage Foundation, 2025). The analysis uses the verified project-activity ISIC Rev. 4 match (United Nations, 2008) as the preferred sector classification. The key principle is to classify the recipient or project activity, not the Chinese parent’s broad industry and not mechanically the broad CGIT label. This distinction matters for construction, transport infrastructure, power generation, metals, batteries, autos, and mining, where broad labels can place economically different projects in the same bucket.

The project-level match produces host-country-year-sector investment aggregates at the ISIC Rev. 4 two-digit level. The preferred panel includes verified rows and the remaining manual-review rows. Appendix Table 10 shows how the main quantity-share results change when remaining manual-review rows are excluded. CGIT distinguishes investments, which involve ownership, from construction contracts, which do not. Construction contracts are retained because Chinese overseas construction activity can generate upstream input demand, which is central to the demand-pull mechanism. The aggregate treatment therefore measures combined Chinese investment and construction activity.

## 4.2 Trade Outcomes and Input-Output Linkages

Trade outcomes are constructed from the CEPII BACI bilateral trade database, HS 2002 revision, January 2026 release, which reports trade values and quantities through 2024 (Gaulier and Zignago, 2010; CEPII, 2026). Products are mapped to ISIC Rev. 4 sectors and aggregated to the country-sector-year level. The main outcomes are Greater China import value and quantity shares:

$$ValueShare_{cst} = 100 \times \frac{\text{imports from Greater China by value}_{cst}}{\text{total imports by value}_{cst}}, \quad (6)$$

$$QuantityShare_{cst} = 100 \times \frac{\text{imports from Greater China by quantity}_{cst}}{\text{total imports by quantity}_{cst}}. \quad (7)$$

Greater China includes mainland China, Hong Kong, and Macau throughout the paper. Quantity shares are the preferred aggregate outcome because they are closer to physical sourcing and are less directly affected by unit values and price composition than value shares.

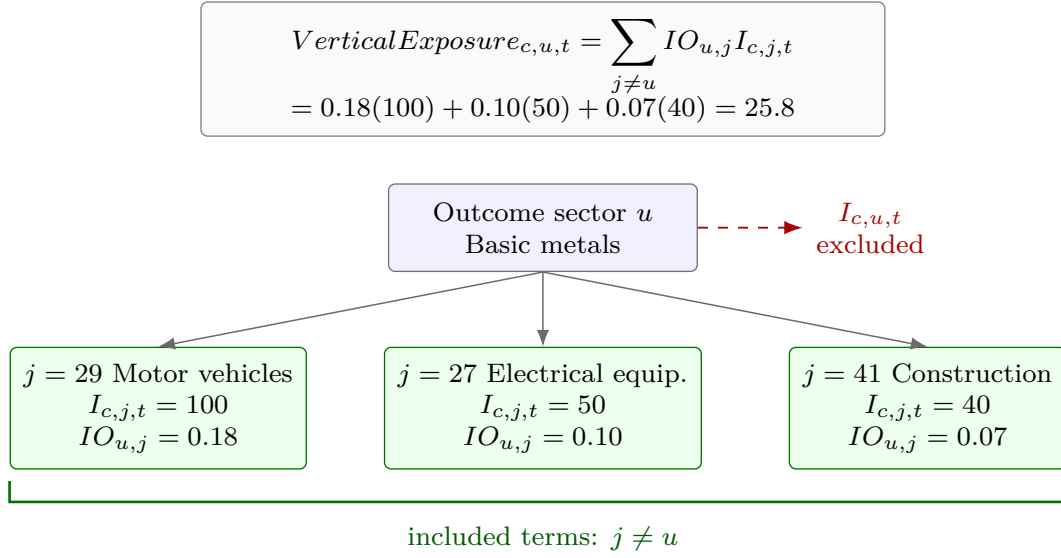
Production-network exposure is built from OECD Inter-Country Input-Output (ICIO) coefficients from the 2025 edition, using the 2016–2022 extended ICIO files aggregated to ISIC two-digit sectors (Organisation for Economic Co-operation and Development, 2025a). Let  $u$  index an upstream ISIC sector and  $j$  index a downstream ISIC sector. The off-diagonal exposure measure is

$$VerticalExposure_{c,u,t} = \sum_{j \neq u} IO_{u,j} Investment_{c,j,t}. \quad (8)$$

The restriction  $j \neq u$  is part of the research design. Same-sector Chinese investment is not included in the vertical treatment. It is handled only in robustness checks, either as a direct same-sector investment control or by dropping country-sector years with direct same-sector investment.

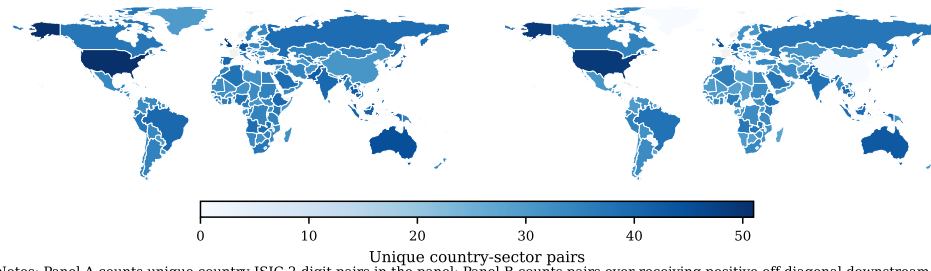
Figure 1 illustrates the construction. For a given host country, year, and upstream sector  $u$ , I take Chinese investment in downstream sectors  $j$ , weight each investment flow by the input-output intensity  $IO_{u,j}$ , and sum only the off-diagonal terms. Direct Chinese investment into the same upstream sector  $u$  is observed in the data but is not part of  $VerticalExposure_{c,u,t}$ .

Figure 2 summarizes the country-sector coverage of the aggregate panel. The exercise is not a case study of a single host economy: the BACI-based trade panel covers 230 reporting economies, 58 ISIC sectors, and 7,717 country-sector pairs. The CGIT investment/construction events are more concentrated: in the 2005–2024 sample used here, CGIT contains project rows in 161 host countries, and 160 countries ever receive positive off-diagonal downstream exposure.



**Figure 1.** Construction of off-diagonal downstream investment exposure  
 Notes: The numerical values are illustrative. The exposure is computed for a host country  $c$ , upstream sector  $u$ , and year  $t$ . Chinese investment in customer sectors  $j$  is weighted by the input-output coefficient from  $u$  to  $j$  and summed over  $j \neq u$ . Direct Chinese investment in sector  $u$  itself is excluded from the vertical treatment by construction.

A. Country-sector pairs in the analysis panel    B. Pairs with positive off-diagonal exposure



Notes: Panel A counts unique country-ISIC 2-digit pairs in the panel; Panel B counts pairs ever receiving positive off-diagonal downstream exposure.

**Figure 2.** Distribution of country-sector pairs in the aggregate panel  
 Notes: Panel A counts unique host-country-by-ISIC two-digit pairs observed in the BACI-CGIT-ICIO panel. Panel B counts unique pairs that ever receive positive off-diagonal downstream exposure. The underlying country-sector-year panel covers 2005–2024.

The allocation exercise uses the World Bank Group sectoral bilateral FDI database, which reports bilateral outward FDI stocks by broad sector for 2008–2019 (Steenbergen et al., 2022). I use outward stock, rather than flows, as the main outcome because the question is whether the realized portfolio of Chinese foreign assets is tilted toward host-sector markets that are complementary to China’s upstream industrial base. To construct the complementarity score, I combine lagged BACI trade with OECD ICIO production links. For each host-sector-year observation, the score is high when the host imports upstream inputs that China can supply and those upstream inputs are important for production in that host sector. The score excludes the China-host bilateral trade dyad before measuring China’s upstream export capability, so it is not mechanically driven by existing China-host trade. The preferred score uses a fixed 2005–2007 ICIO coefficient matrix. I also rebuild the score with a fixed 2008–2010 ICIO matrix and with rolling three-year lagged ICIO matrices. For the size margin, I estimate PPML on outward FDI stock, which keeps zero-stock observations without imposing a log-like transformation.

### 4.3 Firm-Level Supplier Networks

The firm-level mechanism uses proprietary FactSet Revere data on observed supplier-customer relationships, accessed through Wharton Research Data Services (WRDS) (FactSet Research Systems Inc., 2025). I match these links to Chinese investment recipients. Treated units are firms that receive Chinese investment and can be matched to FactSet company identifiers. Candidate controls are non-recipient firms in the same host country covered by these data. The main sample is the all-symmetric event-study sample, which requires a balanced event window from three years before to three years after the first Chinese investment event. Before imposing this balanced-window restriction, the CGIT-FactSet match yields 398 unique recipient firms in 70 host countries. The all-symmetric estimation sample contains 369 treated firms and 1,073 distinct control firms. Appendix Figure 12 compares the host-country distribution of all named CGIT recipients with the subset matched to FactSet. The matched firms are more concentrated in countries with stronger firm-level identifier and relationship coverage, which tend to be more data-rich and higher-income economies. I therefore use the firm-level evidence as a mechanism test among covered firms, not as a claim that the FactSet match reproduces the full geography of CGIT recipients. Because treated recipients are matched to controls within host country, this coverage pattern mainly limits geographic external validity rather than the within-country comparison.

FactSet relationship rows are directed into buyer-supplier links using the relationship type. If the raw relationship is coded as `SUPPLIER`, the source firm is the buyer and the target firm is the supplier. If the raw relationship is coded as `CUSTOMER`, the source firm is the supplier and the target firm is the buyer. Relationships are annualized over their

observed start and end dates. Let  $S_{it}$  denote the observed supplier set of firm  $i$  in year  $t$ :

$$S_{it} = \{s : i \rightarrow s \text{ is an observed buyer-supplier link in year } t\}. \quad (9)$$

For each first-tier supplier  $s \in S_{it}$ , I reconstruct the set of buyers  $B_{st}$  and the set of suppliers  $U_{st}$ :

$$B_{st} = \{b : b \rightarrow s \text{ is an observed buyer of supplier } s \text{ in year } t\}, \quad (10)$$

$$U_{st} = \{q : s \rightarrow q \text{ is an observed supplier of supplier } s \text{ in year } t\}. \quad (11)$$

The first set captures whether the recipient's suppliers sell to Greater China buyers. The second captures whether the recipient's suppliers themselves source from Greater China suppliers.

## 5. AGGREGATE EVIDENCE: CHINESE FDI AND CHINA SOURCING

The aggregate exercise estimates the sector-level sourcing fact. The treatment is high downstream Chinese investment exposure, measured using input-output links from downstream customer sectors to upstream supplier sectors. The outcome is the upstream sector's import share sourced from Greater China. The design is a country-sector-year reduced form: it tests whether sourcing shares move in the direction predicted by supply-chain reorientation, but it does not observe individual procurement contracts.

### 5.1 Empirical Strategy

For the timing-aware design, a country-upstream-sector pair is treated in the first year in which positive off-diagonal downstream exposure is in the top quartile of positive exposure observations, after normalizing by predetermined baseline trade. The cutoff is imposed globally, not separately by sector or country. This rule is meant to filter out mechanically positive but economically small exposure values generated by IO weighting. Splitting a continuous exposure into high- and low-exposure groups is a common way to make event timing and diagnostics interpretable (e.g., [Sraer and Thesmar, 2023](#)); here, the cutoff is a noise-reduction device rather than a structural threshold. Treatment is absorbing. The event year is based on the official CGIT project or transaction year. This timing is measured with error because procurement and planning can begin before the recorded investment year. I therefore use pretrend tests as diagnostics and avoid interpreting the aggregate reduced form as a contract-level procurement design.

The source of variation is within a treatment-cohort-specific matched comparison. For a cohort first treated in year  $g$ , eligible controls must be clean through the event window: they are either never treated or first reach the high-exposure threshold only after  $g + 5$ .

For each treated country-sector pair, I choose up to five comparison pairs using only predetermined information: baseline Greater China import quantity and value shares, baseline trade size, baseline-period outcome trends, two-digit sector, and region. The same-sector match is used whenever possible; otherwise the nearest clean controls are chosen from the remaining pool, with a small penalty for being in a different region. A control pair can enter more than one cohort-specific comparison if it remains clean in that cohort's event window. The identifying comparison is therefore not treated pairs versus all untreated pairs, but treated country-sector pairs versus similar clean pairs observed over the same relative years.

The headline specification is a matched cohort difference-in-differences design:

$$Y_{i,c,t} = \beta (Treated_i \times Post_{i,c,t}) + X'_{i,t}\theta + \alpha_{i,c} + \lambda_{c,t} + \varepsilon_{i,c,t}, \quad (12)$$

Here  $Y_{i,c,t}$  is the Greater China import value or quantity share for country-sector pair  $i$  in matched cohort  $c$  and year  $t$ .  $Treated_i$  identifies country-sector pairs whose first high off-diagonal downstream exposure defines the cohort, and  $Post_{i,c,t}$  turns on after that event year. Cohort-by-entity fixed effects  $\alpha_{i,c}$  absorb permanent differences between each country-sector pair and its matched comparison group. Cohort-by-year fixed effects  $\lambda_{c,t}$  absorb shocks common to treated and control pairs in the same event window. The control vector includes BRI project exposure when it is not absorbed by the cohort fixed effects. The main table reports three ways to handle direct same-sector Chinese investment: no direct same-sector control, a direct same-sector investment control, and a clean vertical sample that drops direct same-sector investment rows.

The identifying assumption is parallel changes within matched cohorts: absent high downstream exposure, treated and clean comparison pairs would have followed similar changes in Greater China import shares. Matching on baseline sourcing shares, trade scale, sector, region, and baseline-period trends targets the main observable threats to that assumption. The pretrend diagnostics reported with the tables assess visible differential trends; they do not rule out unobserved country-sector shocks that both attract Chinese investment and shift sourcing. This is why the text interprets the aggregate estimates as reduced-form sourcing responses rather than direct evidence on procurement contracts.

## 5.2 Results

Table 1 reports the main aggregate estimates. Specifications are organized by outcome and by same-sector handling. Columns (1)–(3) use Greater China import value shares; columns (4)–(6) use Greater China import quantity shares. Panel A reports the full sample, and Panel B restricts to manufacturing sectors. Quantity shares are the pre-

ferred outcome because they are closer to physical sourcing. Value shares are useful corroborating evidence, but they also reflect prices, unit values, and product mix.

**Table 1.** Downstream Chinese Investment Exposure and China Import Shares

| Specification                         | Value share                     |                              |                                | Quantity share                  |                              |                                |
|---------------------------------------|---------------------------------|------------------------------|--------------------------------|---------------------------------|------------------------------|--------------------------------|
|                                       | (1)<br>No direct-sector control | (2)<br>Direct-sector control | (3)<br>Drop direct-sector rows | (4)<br>No direct-sector control | (5)<br>Direct-sector control | (6)<br>Drop direct-sector rows |
| <i>Panel A. Full sample</i>           |                                 |                              |                                |                                 |                              |                                |
| $Post_{it} \times Treated_i$          | 1.625***<br>(0.317)             | 1.625***<br>(0.317)          | 1.711***<br>(0.320)            | 1.386***<br>(0.367)             | 1.385***<br>(0.367)          | 1.437***<br>(0.372)            |
| Pretrend $p$ -value                   | 0.054                           | 0.054                        | 0.082                          | 0.340                           | 0.342                        | 0.362                          |
| Observations                          | 62,994                          | 62,994                       | 61,637                         | 62,994                          | 62,994                       | 61,637                         |
| <i>Panel B. Manufacturing sectors</i> |                                 |                              |                                |                                 |                              |                                |
| $Post_{it} \times Treated_i$          | 2.302***<br>(0.379)             | 2.303***<br>(0.379)          | 2.311***<br>(0.379)            | 1.785***<br>(0.432)             | 1.786***<br>(0.432)          | 1.787***<br>(0.433)            |
| Pretrend $p$ -value                   | 0.005                           | 0.005                        | 0.005                          | 0.082                           | 0.082                        | 0.080                          |
| Observations                          | 42,109                          | 42,109                       | 42,083                         | 42,109                          | 42,109                       | 42,083                         |
| Cohort-entity FE                      | Yes                             | Yes                          | Yes                            | Yes                             | Yes                          | Yes                            |
| Cohort-year FE                        | Yes                             | Yes                          | Yes                            | Yes                             | Yes                          | Yes                            |
| BRI control                           | Yes                             | Yes                          | Abs.                           | Yes                             | Yes                          | Abs.                           |
| Direct-sector FDI control             | No                              | Yes                          | No                             | No                              | Yes                          | No                             |
| Direct-sector rows dropped            | No                              | No                           | Yes                            | No                              | No                           | Yes                            |

Notes: The table reports matched cohort DiD estimates. The dependent variables are Greater China import shares, in percentage points. The treatment is the first high off-diagonal downstream Chinese investment exposure event, defined using the top quartile of positive exposure normalized by predetermined baseline trade. Columns (1)–(3) use value shares; columns (4)–(6) use quantity shares. Standard errors, in parentheses, are clustered by country-sector. The BRI control is included when estimable; in drop-direct specifications it is absorbed by the cohort fixed effects. “Manufacturing sectors” are ISIC Rev. 4 sectors 10–33. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

The main aggregate result is that treated upstream sectors shift toward Greater China sourcing. In the preferred full-sample quantity-share specification, which drops direct same-sector investment rows, the coefficient is 1.44 percentage points, with a pretrend  $p$ -value of 0.36. The estimate is nearly unchanged when direct same-sector investment is controlled for rather than dropped. The corresponding value-share estimates are positive and somewhat larger, but their pretrend diagnostics are weaker. I therefore treat the quantity-share estimate as the headline aggregate number.

The manufacturing panel points in the same direction and has larger point estimates. The manufacturing quantity-share effect is about 1.8 percentage points across the three same-sector variants. I treat this as supporting evidence rather than the headline result because the full-sample quantity specification has cleaner timing diagnostics.

Table 2 reports where the clean vertical drop-direct specification is largest at the ISIC two-digit level. The rankings are descriptive heterogeneity evidence rather than the headline design, but they show that the largest positive effects are concentrated in sectors that are natural candidates for manufacturing supply-chain reorientation.

The sector-specific table should be read with the smaller effective samples in mind. Each row reruns the matched cohort design within a single two-digit ISIC sector, after dropping direct same-sector investment rows. This leaves far fewer treated country-sector pairs and matched controls than the full-sample regression, so large point estimates can be imprecise. The value-share coefficients are often larger than the quantity-share coefficients, which is consistent with a shift toward higher-unit-value inputs or product mix changes, but value shares also load on prices and unit values. I therefore keep the quantity-share result as the headline aggregate estimate.

Appendix B reports the associated event paths, Sun-Abraham interaction-weighted

**Table 2.** Top sector-level clean-vertical estimates

| Rank                                   | ISIC | Sector                                                                   | Coef.    | SE      | <i>p</i> -value | Pretrend <i>p</i>                                      | Obs.  | Treated pairs | Mfg. |
|----------------------------------------|------|--------------------------------------------------------------------------|----------|---------|-----------------|--------------------------------------------------------|-------|---------------|------|
| <i>Panel A. Quantity-share effects</i> |      |                                                                          |          |         |                 |                                                        |       |               |      |
| 1                                      | 14   | Manufacture of wearing apparel                                           | 7.979**  | (3.498) | 0.023           | 0.554                                                  | 1,578 | 27            | Yes  |
| 2                                      | 32   | Other manufacturing                                                      | 3.993**  | (1.901) | 0.036           | 0.278                                                  | 2,788 | 49            | Yes  |
| 3                                      | 90   | Creative, arts and entertainment activities                              | 3.782    | (2.843) | 0.183           | 0.968                                                  | 3,136 | 58            | No   |
| 4                                      | 13   | Manufacture of textiles                                                  | 3.433    | (2.457) | 0.162           | 0.592                                                  | 1,225 | 20            | Yes  |
| 5                                      | 28   | Manufacture of machinery and equipment n.e.c.                            | 3.003    | (3.182) | 0.345           | 0.204                                                  | 952   | 15            | Yes  |
| 6                                      | 23   | Manufacture of other non-metallic mineral products                       | 2.741**  | (1.327) | 0.039           | 0.967                                                  | 2,872 | 53            | Yes  |
| 7                                      | 31   | Manufacture of furniture                                                 | 2.617    | (2.126) | 0.218           | 0.368                                                  | 2,831 | 51            | Yes  |
| 8                                      | 22   | Manufacture of rubber and plastics products                              | 2.600*   | (1.410) | 0.065           | 0.189                                                  | 1,918 | 32            | Yes  |
| 9                                      | 25   | Manufacture of fabricated metal products, except machinery and equipment | 2.539    | (1.748) | 0.146           | 0.240                                                  | 2,789 | 49            | Yes  |
| 10                                     | 18   | Printing and reproduction of recorded media                              | 2.447**  | (1.216) | 0.044           | 0.387                                                  | 3,625 | 60            | Yes  |
| <i>Panel B. Value-share effects</i>    |      |                                                                          |          |         |                 |                                                        |       |               |      |
| 1                                      | 14   | Manufacture of wearing apparel                                           | 7.429*** | (2.882) | 0.010           | 0.336                                                  | 1,578 | 27            | Yes  |
| 2                                      | 13   | Manufacture of textiles                                                  | 5.522**  | (2.481) | 0.026           | 0.671                                                  | 1,225 | 20            | Yes  |
| 3                                      | 22   | Manufacture of rubber and plastics products                              | 4.053*** | (1.417) | 0.004           | 0.007                                                  | 1,918 | 32            | Yes  |
| 4                                      | 28   | Manufacture of machinery and equipment n.e.c.                            | 3.841*   | (2.287) | 0.093           | 0.127                                                  | 952   | 15            | Yes  |
| 5                                      | 23   | Manufacture of other non-metallic mineral products                       | 3.441*** | (1.105) | 0.002           | 0.918                                                  | 2,872 | 53            | Yes  |
| 6                                      | 25   | Manufacture of fabricated metal products, except machinery and equipment | 3.370**  | (1.485) | 0.023           | 0.416                                                  | 2,789 | 49            | Yes  |
| 7                                      | 27   | Manufacture of electrical equipment                                      | 3.299    | (2.450) | 0.178           | 0.389                                                  | 1,458 | 25            | Yes  |
| 8                                      | 90   | Creative, arts and entertainment activities                              | 3.280    | (2.035) | 0.107           | 0.560                                                  | 3,136 | 58            | No   |
| 9                                      | 31   | Manufacture of furniture                                                 | 3.037*   | (1.819) | 0.095           | 0.907                                                  | 2,831 | 51            | Yes  |
| 10                                     | 18   | Printing and reproduction of recorded media                              | 2.793*** | (1.081) | 0.010           | 0.356                                                  | 3,625 | 60            | Yes  |
| Cohort-entity FE                       |      |                                                                          |          |         |                 | Yes                                                    |       |               |      |
| Cohort-year FE                         |      |                                                                          |          |         |                 | Yes                                                    |       |               |      |
| Direct same-sector rows dropped        |      |                                                                          |          |         |                 | Yes                                                    |       |               |      |
| BRI control                            |      |                                                                          |          |         |                 | Included when estimable; otherwise absorbed or dropped |       |               |      |

Notes: The table ranks ISIC Rev. 4 two-digit sectors by the positive matched cohort DiD coefficient from the clean vertical specification that drops direct same-sector Chinese investment rows. Coefficients are percentage points of Greater China import share. Sector estimates are computed from the current verified 2005–2024 aggregate panel using the same top-quartile off-diagonal downstream-exposure treatment definition as Table 1. Standard errors are clustered by country-sector. “Mfg.” indicates ISIC sectors 10–33. \* $p < 0.10$ , \*\* $p < 0.05$ , and \*\*\* $p < 0.01$ .

estimates, capital-control cohort split, development-status heterogeneity, and manual-review robustness checks.

### 5.3 Investment Allocation and Industrial Complementarity

The aggregate estimates show what happens after downstream Chinese investment enters a host economy. A separate question is whether Chinese outward FDI is allocated to host-sector markets where this mechanism has more scope to operate. I cannot estimate the approval rule directly because I do not observe rejected applications or administrative review files. I can, however, ask whether the realized Chinese FDI portfolio is tilted toward markets with high predicted demand-pull complementarity to China’s upstream industries.

I build a China-specific downstream-pull score at the host-sector-year level. The score combines China’s lagged upstream export capability, the host’s lagged import demand for those upstream inputs, and ICIO links measuring how much each downstream sector uses each upstream sector’s output. The China-host bilateral trade dyad is excluded before measuring China’s capability and the host’s demand. The baseline score uses pre-period 2005–2007 ICIO coefficients, and the robustness checks use either a fixed 2008–2010 ICIO matrix or rolling three-year lagged ICIO matrices. The score is standardized within year; I also use a year-sector-standardized version to check whether the result is driven only by broad sector composition. Appendix C details the construction and the economic interpretation of the score.

To quantify the pattern, I use a source-host-sector-year panel for China and 12 non-China source economies selected to be close to China in pre-period outward FDI size and

reach. I estimate the reach margin with a linear fixed-effects model for positive outward FDI stock. For the size margin, I estimate PPML, which is the standard approach for gravity-style nonnegative outcomes with many zeros (Santos Silva and Tenreyro, 2006). The high-dimensional fixed effects are absorbed following Correia et al. (2020). This choice also avoids making a log-like transformation central in a setting where extensive-margin zeros matter (Chen and Roth, 2024). The PPML specification is

$$\begin{aligned} \log \mathbb{E}[FDI_{s,d,j,t} \mid X] = & \beta MP_{d,j,t}^{CHN} + \delta (China_s \times MP_{d,j,t}^{CHN}) \\ & + \rho SP_{d,j,t}^{CHN} + \kappa (China_s \times SP_{d,j,t}^{CHN}) + \alpha_{s,t} + \mu_{d,t} + \nu_{j,t}. \end{aligned} \quad (13)$$

Here  $FDI_{s,d,j,t}$  is outward FDI stock from source country  $s$  to destination country  $d$  in sector  $j$  and year  $t$ . The fixed effects absorb source-year scale, destination-year attractiveness, and sector-year shocks. The coefficient of interest is  $\delta$ , the excess China slope on the China-complementarity score. I also report a log-stock regression restricted to observations with positive FDI stock; that check isolates the intensive margin among markets where a source country already has a recorded position. Each specification controls for the corresponding upstream-security score and its China interaction.

**Table 3.** Chinese outward FDI allocation and China-complementarity

| Specification                             | ICIO coefficient window |                     |                     |
|-------------------------------------------|-------------------------|---------------------|---------------------|
|                                           | 2005–2007 baseline      | 2008–2010 fixed     | Rolling 3-year lag  |
| Reach: positive outward FDI stock         | 0.009<br>(0.006)        | 0.009<br>(0.006)    | 0.009<br>(0.006)    |
| Size: PPML outward FDI stock              | 0.706***<br>(0.246)     | 0.707***<br>(0.241) | 0.724***<br>(0.234) |
| Size: log stock among positive FDI stocks | 0.765***<br>(0.277)     | 0.762***<br>(0.276) | 0.757***<br>(0.271) |
| Size: year-sector standardized score      | 0.414<br>(0.345)        | 0.400<br>(0.340)    | 0.403<br>(0.334)    |
| Size: top-quartile China-complementarity  | 0.520***<br>(0.153)     | 0.542***<br>(0.158) | 0.521***<br>(0.155) |
| Source-year FE                            | Yes                     | Yes                 | Yes                 |
| Destination-year FE                       | Yes                     | Yes                 | Yes                 |
| Sector-year FE                            | Yes                     | Yes                 | Yes                 |
| Upstream-security score controls          | Yes                     | Yes                 | Yes                 |

Notes: Entries are coefficients on China source  $\times$  downstream-pull complementarity. Unit: source-host-sector-year; sources: China and 12 size-and-reach peers. Reach uses a linear probability model. Size uses PPML, except the positive-stock row, which uses log stock conditional on positive FDI. All models include the listed fixed effects and upstream-security controls; standard errors are clustered by host. Samples: reach  $N = 683,232$ ; PPML effective  $N = 177,914$  after separation drops; positive-stock log  $N = 24,360$ . Columns vary the ICIO coefficient window. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

The fixed-effect estimates in Table 3 provide the main statistical test of the allocation pattern. In the baseline PPML specification, a one-standard-deviation increase in downstream-pull complementarity raises China’s expected outward FDI stock by about 103 percent relative to the peer slope. The coefficient is 0.706, with a standard error of

0.246. The same coefficient is 0.707 using the fixed 2008–2010 ICIO matrix and 0.724 using rolling lagged ICIO coefficients. Among observations with positive FDI stocks, the log-stock coefficient is 0.765. The top-quartile complementarity indicator also gives a positive size result. The year-sector-standardized PPML coefficient is positive but imprecise, so I do not claim that the result is fully within narrow sector-year comparisons. The reach margin is also positive but imprecisely estimated. The stronger statement is about size: when China invests abroad, its realized stock is larger in markets where investment has greater predicted potential to pull demand toward Chinese upstream suppliers. Appendix Figure 11 shows the same pattern in a binned portfolio sort. Appendix Table 11 and Figure 10 collapse the same object to the destination level and show that the destinations with the largest realized Chinese FDI positions are also high in the predicted pull ranking.

This evidence complements the aggregate sourcing result rather than replacing it. The sourcing regressions show that exposed upstream sectors subsequently source more from Greater China. The allocation regressions show that Chinese outward FDI is itself concentrated, in size, in host-sector markets where that demand-pull channel is predicted to be stronger. The next section moves from sector-level trade and allocation patterns to the firm-level relationships through which this reorientation may occur.

## 6. FIRM-LEVEL MECHANISM: SUPPLY-NETWORK EMBEDDING

The firm-level analysis asks whether the aggregate sourcing result has a network counterpart around investment recipients. If downstream Chinese FDI pulls host firms toward China-linked supply chains, recipient firms should become more connected to Greater China suppliers, and their surrounding supplier neighborhoods should become more China-linked.

This is a mechanism test among covered firms. I match CGIT investment recipients to the supplier-customer links described in Section 4 and compare them with matched non-recipient firms in the same host country. These data do not observe all contracts, transaction values, prices, or quantities, so this section does not measure total procurement. It instead measures observed business relationships. That is the right object for the mechanism: Section 5 asks whether import shares move toward Greater China, while this section asks whether the production-network neighborhood around recipients moves in the same direction.

### 6.1 Network Outcomes

Let  $S_{it}$  denote the set of observed suppliers of firm  $i$  in year  $t$ , and let  $G$  denote firms headquartered in mainland China, Hong Kong, or Macau. The first outcome is the

recipient's direct Greater China supplier share,

$$DirectGC_{it} = \frac{|S_{it} \cap G|}{|S_{it}|}. \quad (14)$$

This measure captures the most literal form of integration: whether a recipient firm is observed sourcing from more Greater China suppliers after Chinese investment.

The second set of outcomes captures indirect embedding. A recipient can become more China-linked even if it does not add many direct Greater China suppliers. Its suppliers may already sell to Greater China buyers, or they may themselves source from Greater China suppliers. A representative buyer-side measure is

$$IndirectDown_{it} = \frac{|\{s \in S_{it} \setminus G : B_{st} \cap G \neq \emptyset\}|}{|S_{it}|}, \quad (15)$$

where  $B_{st}$  is the set of observed buyers of supplier  $s$  in year  $t$ . This measure is high when the recipient's non-Greater-China suppliers also sell to Greater China buyers. Appendix E defines the analogous supplier-side measures and the intensity and path-count components.

The preferred summary outcome is an indirect China embedding index. The index summarizes six measures of whether a recipient's first-tier suppliers are themselves connected to Greater China, either through their buyers or through their own suppliers. On the buyer side, the components capture whether non-Greater-China suppliers sell to Greater China buyers, the average intensity of Greater China buyer links across first-tier suppliers, and the number of observed two-hop paths to Greater China buyers. On the supplier side, they capture whether non-Greater-China suppliers source from Greater China, the average intensity of Greater China supplier links across first-tier suppliers, and the number of observed two-hop paths to Greater China suppliers. Count-based path measures are transformed using the inverse hyperbolic sine. Each component is then standardized using the matched-control pre-period distribution. The preferred index averages the six standardized components:

$$IndirectEmbed_{it} = \frac{1}{6} \left( Z_{it}^{IndirectDown} + Z_{it}^{BuyerShare} + Z_{it}^{BuyerPaths} + Z_{it}^{NonGCUstream} + Z_{it}^{SupplierShare} + Z_{it}^{SupplierPaths} \right). \quad (16)$$

Here each  $Z$  is the corresponding firm-year component measured relative to the control-firm pre-period distribution. Specifically,  $Z^{IndirectDown}$ ,  $Z^{BuyerShare}$ , and  $Z^{BuyerPaths}$  measure, respectively, whether the recipient's non-Greater-China suppliers reach Greater China buyers at all, how intensively first-tier suppliers sell to those buyers, and the number of observed two-hop buyer paths.  $Z^{NonGCUstream}$ ,  $Z^{SupplierShare}$ , and  $Z^{SupplierPaths}$

are the parallel supplier-side measures for whether non-Greater-China first-tier suppliers source from Greater China, the intensity of those supplier links, and the number of observed two-hop supplier paths. Appendix E gives the full construction, including denominators, zero-link coding, path-count transformations, and standardization. The index does not include the recipient's own direct Greater China supplier share as a component. It is therefore designed to capture the China-linked structure of the surrounding supplier neighborhood rather than only the mechanical addition of Chinese first-tier suppliers. The equal weighting follows the summary-index logic of [Kling et al. \(2007\)](#); identification comes from the event design, not from the choice of weights.

I also use exposure to non-Greater-China foreign suppliers as a diagnostic outcome. This measure asks whether treated firms become more internationally connected in general, rather than specifically more China-linked. A broad internationalization story would predict increases in both China-linked and non-Greater-China foreign exposure. The evidence below is more specific.

## 6.2 Empirical Design

Treatment is the first matched Chinese investment event for a recipient firm. I define a matched cohort by the treated recipient and its investment year. The candidate control pool consists of covered non-recipient firms in the same host country, with ticker information and not identified as a CGIT recipient. For each treated recipient, I select up to five nearest controls using only pre-treatment network characteristics measured in event years  $-3$ ,  $-2$ , and  $-1$ : log supplier count, supplier-count trend, direct Greater China supplier share, China-exposed supplier share, average supplier Greater China buyer exposure, upstream China-linked supplier share, and average supplier Greater China supplier exposure. Distance is computed after standardizing each matching variable by its dispersion among candidate controls in the same host country and event year. The preferred all-symmetric sample requires treated and control firms to be observed for the full  $[-3, 3]$  window; the active-pre/post sample is a diagnostic subsample that also requires observed supplier activity before and after treatment. The matched cohort therefore supplies the comparison group: treated recipients are compared with observably similar firms in the same host economy and the same relative years.

The preferred estimator is the interaction-weighted event study of [Sun and Abraham \(2021\)](#). This choice matters because Chinese investment events occur in different years. A conventional two-way fixed effects event study can mix already-treated and not-yet-treated cohorts when treatment effects are heterogeneous. I instead estimate treatment-year-cohort event-time coefficients,

$$Y_{ict} = \sum_g \sum_{\tau \neq -1} \theta_{g\tau} \mathbf{1}\{g_c = g\} \mathbf{1}\{Treated_{ic} = 1\} \mathbf{1}\{t - g_c = \tau\} + \alpha_{ic} + \lambda_{ct} + \varepsilon_{ict}, \quad (17)$$

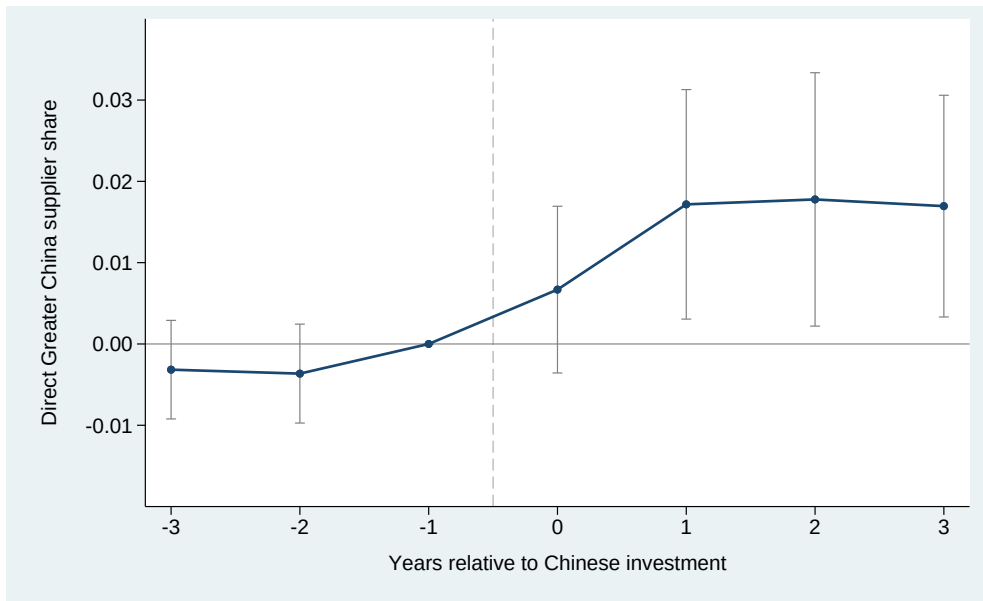
where  $i$  indexes firms,  $c$  indexes matched cohorts,  $g_c$  is the investment year defining cohort  $c$ , and  $\tau = t - g_c$  is event time.  $Treated_{ic}$  identifies the recipient firm within its matched cohort. The omitted period is  $\tau = -1$ . Cohort-by-firm fixed effects  $\alpha_{ic}$  absorb permanent differences between each firm and its matched comparison group. Cohort-by-year fixed effects  $\lambda_{ct}$  absorb calendar-year shocks common to treated and control firms inside the same matched cohort. I aggregate the treatment-year cohort coefficients using cohort shares in the normalized base period. Each reported event-time coefficient therefore compares treated recipients with matched same-country controls at the same event time, net of cohort-by-firm and cohort-by-year fixed effects. Standard errors are clustered by firm.

The identifying assumption is parallel changes within matched cohorts: absent Chinese investment, treated recipients and their matched controls would have followed similar changes in China-linked supplier-network outcomes. Matching on pre-treatment supplier scale, trends, and China exposure makes this assumption more credible, and the pre-event coefficients test for visible differential trends. They cannot rule out unobserved time-varying shocks that both attract Chinese investment and alter supplier networks, so I interpret this section as a mechanism test that complements the aggregate reduced form rather than as a stand-alone causal estimate of procurement volumes.

### 6.3 Results

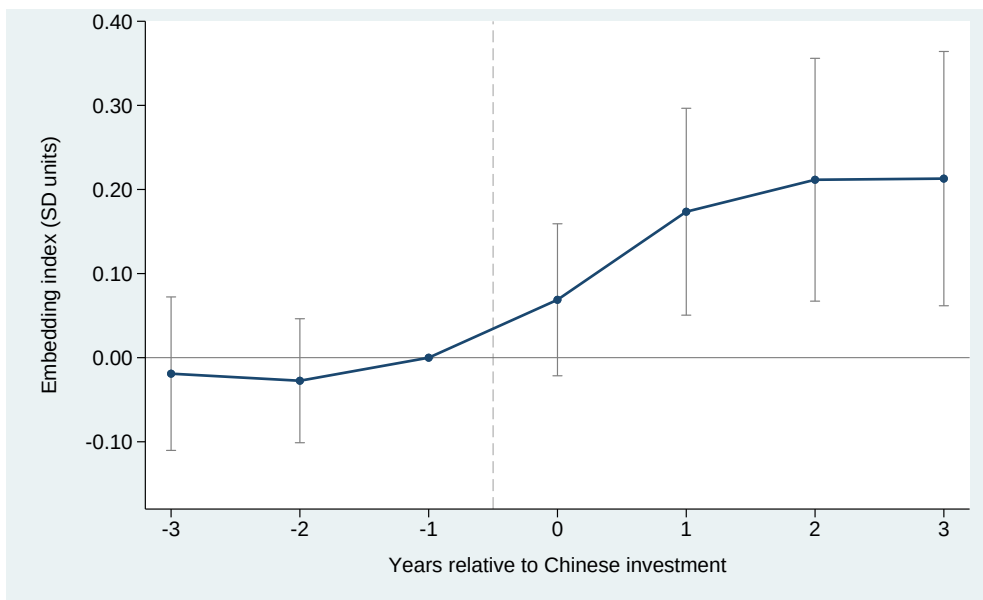
Figure 3 shows that Greater China firms account for a larger share of recipients' observed first-tier suppliers after Chinese investment. Relative to matched controls, the share rises by 1.7 to 1.8 percentage points in event years +1 through +3. This increase follows small coefficients in event years -3 and -2 and is more than twice the treated firms' pre-period mean direct share of 0.7 percent (Appendix Table 14). The direct response is therefore economically substantial, although its interpretation is necessarily about supplier composition: FactSet records relationships, not the value of inputs purchased from each supplier.

The more striking result is that this reorientation extends beyond the recipient's own supplier list. Figure 4 plots the indirect embedding index, which excludes the recipient's direct Greater China supplier share and combines six standardized measures of its suppliers' own buyer and supplier links to Greater China. The index rises by 0.17 index units in event year +1 and by about 0.21 in event years +2 and +3, following small pre-event coefficients. Because the index omits the direct share, its movement captures the China exposure of firms one step farther out in the network. After investment, recipient firms are therefore linked to Greater China through more than their own first-tier suppliers: they are also increasingly connected to suppliers whose buyers and suppliers reach Greater China.



**Figure 3.** Direct Greater China supplier share

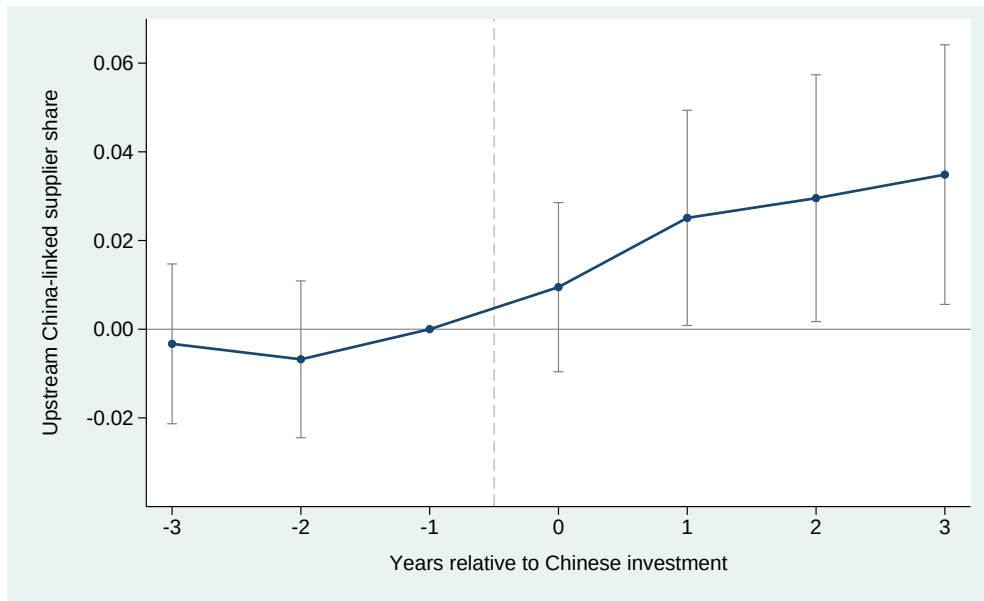
Notes: The outcome is the share of a firm's observed suppliers located in Greater China. The omitted event time is  $-1$ . Standard errors are clustered by firm.



**Figure 4.** Indirect China embedding index

Notes: The figure reports Sun-Abraham interaction-weighted event-study coefficients for the all-symmetric matched cohort sample. The outcome is the indirect China embedding index, the equal-weight average of six components, each standardized using the pre-period control distribution. The omitted event time is  $-1$ . Standard errors are clustered by firm.

Figure 5 makes this indirect change concrete by focusing on supplier-side links. The share of a recipient's first-tier suppliers that themselves source from Greater China rises by 2.5 percentage points in event year +1 and by 3.5 percentage points in event year +3. The latter increase is roughly two-thirds of the treated firms' pre-period mean of 5.5 percent. A growing share of recipients' suppliers therefore have Greater China suppliers of their own. The buyer-side component in Appendix Figure 14 is also positive after investment, although its coefficients are imprecisely estimated.



**Figure 5.** Upstream China-linked supplier share

Notes: The outcome is the share of a recipient's first-tier suppliers that source from at least one Greater China supplier. The omitted event time is  $-1$ . Standard errors are clustered by firm.

This firm-level reorientation is the relationship-level counterpart to the aggregate sourcing result in Section 5, where IO-linked upstream sectors increase their Greater China import share after Chinese investment enters downstream industries. The two analyses measure different objects: the trade data record import values and quantities across sectors, whereas FactSet records supplier relationships for covered firms. Yet both move in the same direction. Greater China sourcing rises in linked upstream sectors, and Greater China relationships become more prevalent around identified investment recipients.

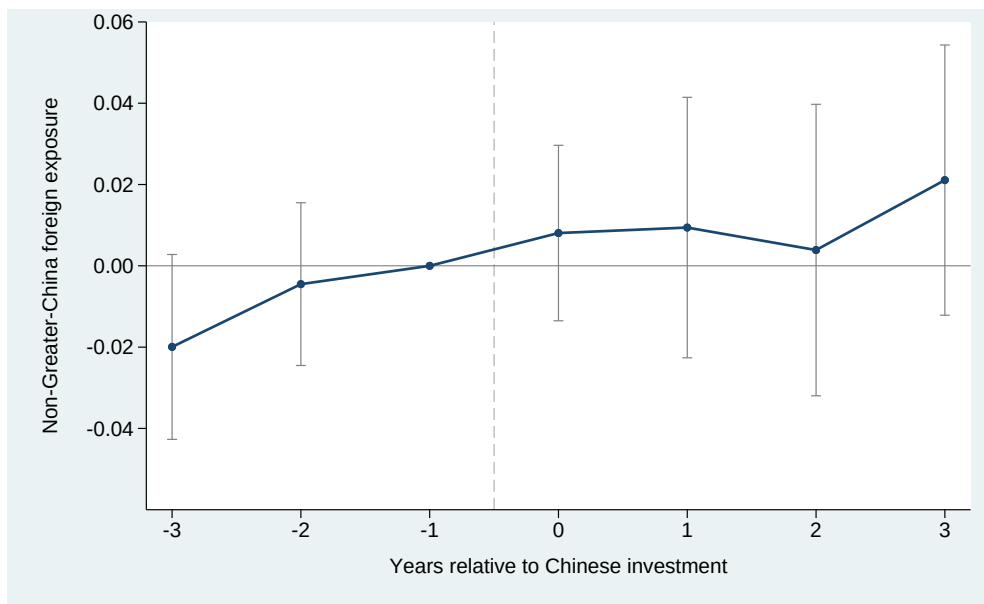
Table 4 reports the exact coefficients and standard errors underlying Figures 3–5.

**Table 4.** Event-study coefficients for firm-level network outcomes

| Event time      | Direct GC supplier share | Indirect China embedding index | Upstream GC-linked supplier share |
|-----------------|--------------------------|--------------------------------|-----------------------------------|
| $\tau = -3$     | -0.003<br>(0.003)        | -0.019<br>(0.047)              | -0.003<br>(0.009)                 |
| $\tau = -2$     | -0.004<br>(0.003)        | -0.027<br>(0.038)              | -0.007<br>(0.009)                 |
| $\tau = +0$     | 0.007<br>(0.005)         | 0.069<br>(0.046)               | 0.009<br>(0.010)                  |
| $\tau = +1$     | 0.017**<br>(0.007)       | 0.174***<br>(0.063)            | 0.025**<br>(0.012)                |
| $\tau = +2$     | 0.018**<br>(0.008)       | 0.212***<br>(0.074)            | 0.030**<br>(0.014)                |
| $\tau = +3$     | 0.017**<br>(0.007)       | 0.213***<br>(0.077)            | 0.035**<br>(0.015)                |
| Observations    | 15,477                   | 15,477                         | 15,477                            |
| Treated firms   | 369                      | 369                            | 369                               |
| Control firms   | 1,073                    | 1,073                          | 1,073                             |
| Matched cohorts | 369                      | 369                            | 369                               |
| Cohorts used    | 16                       | 16                             | 16                                |
| Estimator       | Sun-Abraham IW           | Sun-Abraham IW                 | Sun-Abraham IW                    |
| Sample          | All-symmetric            | All-symmetric                  | All-symmetric                     |
| Cohort-firm FE  | Yes                      | Yes                            | Yes                               |
| Cohort-year FE  | Yes                      | Yes                            | Yes                               |
| SE clustering   | Firm                     | Firm                           | Firm                              |

Notes: The table reports the Sun-Abraham interaction-weighted event-study coefficients for the three China-linkage outcomes in Section 6: direct Greater China supplier share, indirect embedding, and upstream Greater China-linked supplier share. Event time  $\tau = -1$  is omitted and normalized to zero. Share outcomes are measured in shares, so 0.017 corresponds to 1.7 percentage points. The indirect embedding index is the equal-weight average of six components, each standardized using the pre-period control distribution, so its coefficients are in index units. Standard errors clustered by firm are in parentheses. \* $p < 0.10$ , \*\* $p < 0.05$ , and \*\*\* $p < 0.01$ .

One concern is that Chinese investment may coincide with broader internationalization rather than a China-specific reorientation. If so, recipients' suppliers should also expand their links to foreign firms outside Greater China. Figure 6 provides an informative but imprecise comparison. The post-event point estimates are positive, but their confidence intervals include zero in every year. In event year +3, for example, the estimate is 2.1 percentage points, with a 95 percent confidence interval from  $-1.2$  to  $5.4$  percentage points. The comparison does not reproduce the persistent, precisely estimated increase in the China-linked outcomes, but the intervals are too wide to rule out economically meaningful changes in other foreign exposure. I therefore treat Figure 6 as a diagnostic rather than evidence of a precisely estimated zero.



**Figure 6.** Non-Greater-China foreign upstream supplier exposure

Notes: The outcome averages, across a recipient's first-tier suppliers, the share of each supplier's own observed suppliers that are foreign to the first-tier supplier and not located in Greater China. The omitted event time is  $-1$ . Standard errors are clustered by firm.

For the covered firms, Chinese investment is followed by more than a change in recipients' bilateral supplier relationships. Recipients become more directly connected to Greater China, while their supplier neighborhood becomes more China-linked as well. This broader reorientation supports the interpretation that outward FDI can draw host firms into the investing country's supply network.

## 7. CONCLUSION

This paper studies whether Chinese FDI deepens host-country integration into China's supply network. The answer is yes in a specific and measurable sense. When Chinese investment enters downstream customer industries, IO-linked upstream sectors subsequently source a larger share of import quantities from Greater China. When Chinese investment reaches identifiable firms, those recipients become more connected to Greater China suppliers, and their surrounding supplier neighborhoods become more China-linked beyond the recipient's own direct Greater China supplier share. The sector-level evidence and the firm-level evidence therefore point to the same economic object: outward FDI is followed by a reorientation of sourcing relationships, not only by a relocation of ownership or capital.

The interpretation is deliberately narrower than a claim that Chinese FDI raises all trade with China or mechanically creates vertical integration in every host market. The results instead show that downstream investment can operate beyond the boundary of the investing affiliate. It can change the set of counterparties through which host-country firms search for, maintain, and organize input relationships. This distinction matters for how outward FDI is understood. If the relevant object is only the affiliate, then the main economic questions are where capital is located and what profits it earns. If the relevant object is the supplier network around the affiliate, then outward FDI can also affect demand for home-country upstream producers and the geography of global value chains.

This point is particularly important in the Chinese setting. Chinese outward investment is embedded in a partially controlled capital account and an outbound-investment regime that requires review, filing, reporting, and monitoring for overseas projects. Official policy in 2017 distinguished encouraged, restricted, and prohibited directions for overseas investment, and highlighted overseas activities connected to infrastructure, production-capacity cooperation, advanced manufacturing, energy and resources, agriculture, logistics, and service networks ([State Council of the People's Republic of China, 2017](#)). NDRC procedures and SAFE foreign-exchange rules further mean that cross-border direct investment is not simply an unconstrained private transfer of funds ([National Development and Reform Commission, 2017](#); [State Administration of Foreign Exchange, 2009](#)). This institutional background does not prove that the government selected the projects in this paper to restructure particular supply chains. The data do not contain approval files, policy deliberations, or bank-level remittance records. But it does raise the economic stakes of the findings. If Chinese investment abroad passing through this institutional environment is followed by greater China-linked sourcing, then outward FDI is one channel through which a state-mediated economy can extend the

reach of its production network beyond national borders.

The policy and geoeconomic implication is therefore not that every Chinese project should be interpreted as a directed industrial-policy instrument. It is that outward investment can have supply-chain consequences that are missed by standard capital-flow measures. For the home country, the results suggest a potential external benefit of downstream outward FDI: host-country firms and sectors may create demand for home-country upstream suppliers. For host countries, the same process can deepen access to Chinese supplier networks while also increasing dependence on China-linked input channels. For researchers and policymakers, the paper shows why ownership, trade, and production-network data need to be studied jointly. None of the three, taken alone, is sufficient to observe this form of integration.

Several limitations are central to the interpretation. The aggregate design uses sectoral trade flows, so it cannot identify the exact contracts, firms, or products through which sourcing changes occur. The firm-level network data observe buyer-supplier relationships but not transaction values, prices, quantities, or contract terms. The investment data capture large visible Chinese projects and transactions, not the universe of smaller private investments. The analysis also does not observe NDRC approval decisions, SAFE registration files, or bank-level cross-border payments. Methodologically, the event-study designs discipline timing and comparison groups, but they do not isolate a single micro friction. The results are consistent with several channels, including search, standards, procurement routines, financing, logistics, and managerial coordination. The contribution is to document the network reorientation itself, not to prove which of these mechanisms is uniquely responsible.

These limitations point to the next research agenda. One direction is to link outward investment approvals, financing sources, and foreign-exchange registration records to project-level outcomes. A second is to compare Chinese FDI with outward FDI from other source countries, which would separate general multinational network effects from features specific to China's policy and production system. A third is to use customs transactions, procurement records, or firm input data to measure the value and composition of the supplier links that are observed here only as relationships. Finally, the welfare effects remain open. Deeper China-linked sourcing may lower input costs, improve access to suppliers, and support industrial upgrading in some host economies, while also changing exposure to geopolitical and supply-chain risk. Understanding that tradeoff is essential for evaluating outward FDI in a world where capital flows, industrial policy, and production networks are increasingly intertwined.

## Appendix

### A. DATA CONSTRUCTION AND SAMPLE DEFINITIONS

Table 5 reports summary statistics for the country-sector-year panel used in the aggregate exercise. The unit of observation is a host country, ISIC two-digit sector, and year. The sample covers 2005–2024 and uses the verified CGIT project-activity match. The 230 economies in the table refer to the BACI reporting-economy universe in the trade panel; the corresponding CGIT host-country coverage is 161.

**Table 5.** Summary Statistics

| Variable                                      | Mean      | Std. dev.  | Median  | P90       | N       |
|-----------------------------------------------|-----------|------------|---------|-----------|---------|
| Greater China import value share              | 0.132     | 0.188      | 0.045   | 0.401     | 137,026 |
| Greater China import quantity share           | 0.163     | 0.227      | 0.046   | 0.529     | 137,026 |
| Total trade, USD millions                     | 5,109.674 | 27,047.825 | 138.016 | 7,657.402 | 137,026 |
| Off-diagonal vertical exposure                | 2.904     | 27.065     | 0.000   | 3.052     | 137,026 |
| Direct same-sector investment                 | 18.283    | 247.092    | 0.000   | 0.000     | 137,026 |
| Any BRI project                               | 0.018     | 0.133      | 0.000   | 0.000     | 137,026 |
| Country-sector-year observations              |           |            | 137,026 |           |         |
| BACI reporting economies                      |           |            | 230     |           |         |
| CGIT host countries with project rows         |           |            | 161     |           |         |
| Countries with positive off-diagonal exposure |           |            | 160     |           |         |
| ISIC sectors                                  |           |            | 58      |           |         |
| Country-sector pairs                          |           |            | 7,717   |           |         |
| Pairs with positive off-diagonal exposure     |           |            | 5,122   |           |         |
| Pairs with direct same-sector investment      |           |            | 1,289   |           |         |

Notes: The unit of observation is country-sector-year. Greater China import shares are reported on a 0–1 scale; the regressions express them in percentage points. BACI reporting economies refer to the trade-panel universe. CGIT host countries count destinations with investment or construction project rows in Dataset 1+2 during 2005–2024. Off-diagonal vertical exposure is in USD millions weighted by ICIO input-output coefficients. Direct same-sector investment is the unweighted same-sector Chinese investment aggregate in USD millions.

The reported headline specifications do not use World Bank macro controls. The construction pipeline also creates income-quartile variables for auxiliary heterogeneity exercises from World Development Indicators GDP per capita, current US dollars, indicator `NY.GDP.PCAP.CD` (World Bank, 2026). The current pipeline reads the 2001–2025 WDI extract and uses observed 2024 values where available.

#### A.1 Illustrating the Off-Diagonal Exposure Measure

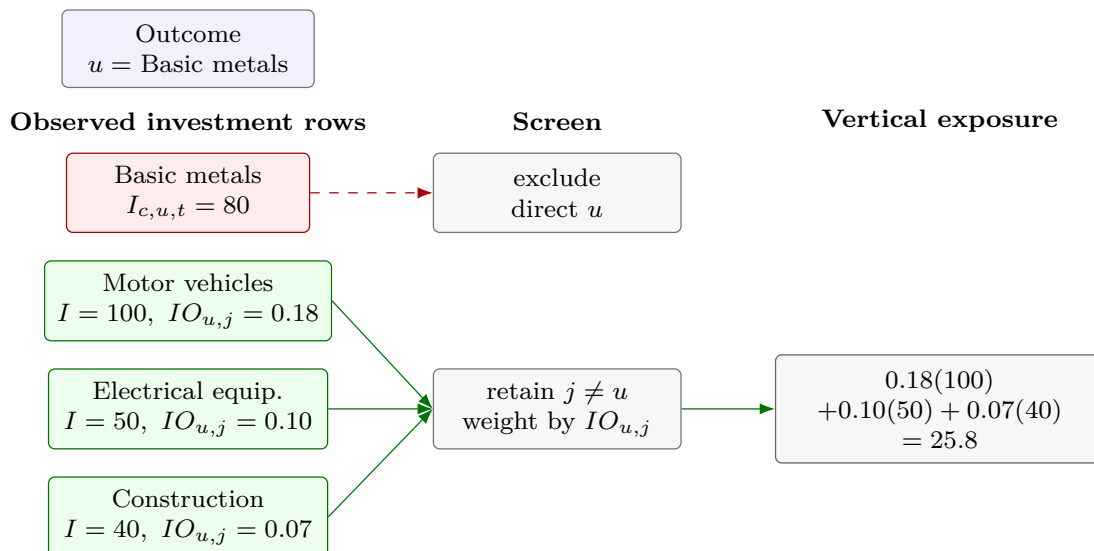
Table 6 gives a stylized row-level example of the exposure construction. The same host-country-year can receive Chinese investment in both the upstream sector being evaluated and in related downstream sectors. The vertical treatment keeps only Chinese investment in downstream customer sectors. Direct investment into the upstream outcome sector itself is visible in the data but does not enter the weighted exposure sum.

**Table 6.** Stylized data sample for off-diagonal vertical exposure

| Host-year                                            | Outcome sector $u$ | Chinese investment row         | Relation to $u$          | IO weight | Investment | Contribution |
|------------------------------------------------------|--------------------|--------------------------------|--------------------------|-----------|------------|--------------|
| Country X, 2016                                      | Basic metals (24)  | Basic metals (24)              | Direct investment in $u$ | –         | 80         | 0.0          |
| Country X, 2016                                      | Basic metals (24)  | Motor vehicles (29)            | Downstream customer      | 0.18      | 100        | 18.0         |
| Country X, 2016                                      | Basic metals (24)  | Electrical equipment (27)      | Downstream customer      | 0.10      | 50         | 5.0          |
| Country X, 2016                                      | Basic metals (24)  | Construction of buildings (41) | Downstream customer      | 0.07      | 40         | 2.8          |
| Off-diagonal vertical exposure for Basic metals (24) |                    |                                |                          |           |            | 25.8         |

Notes: Numbers are illustrative and do not correspond to a specific country-year in the estimation sample. The first row is direct Chinese investment into the outcome sector  $u$  itself, so no input-output weight is used and the contribution to equation (8) is zero. In robustness checks, direct same-sector investment is either added as a separate control or the corresponding country-sector-year is dropped from the clean vertical sample.

Figure 7 shows the same construction as a screening step. Direct Chinese investment into the upstream outcome sector is removed from the treatment. Chinese investment in downstream customer sectors is retained and weighted by the relevant ICIO technical coefficient.

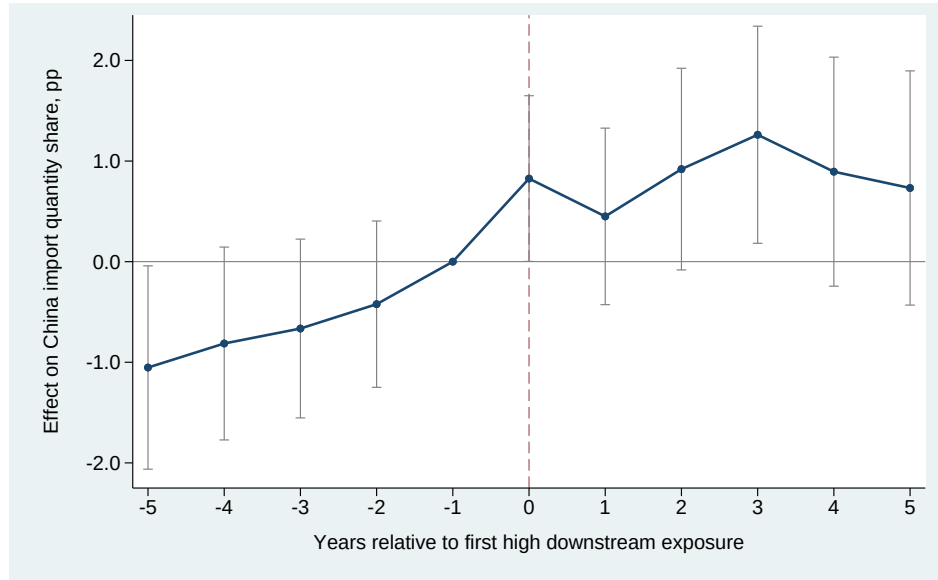
**Figure 7.** Removing direct same-sector investment before forming vertical exposure

Notes: The figure restates Table 6. The red row is direct Chinese investment into the outcome sector  $u$  and is excluded from the treatment. The green rows are Chinese investments in downstream customer sectors and are retained with ICIO weights.

## B. AGGREGATE REDUCED-FORM ROBUSTNESS

Figure 8 plots the event path associated with the headline matched cohort difference-in-differences quantity-share estimate. The static coefficient in Table 1 is the preferred aggregate number; the event path is reported as a timing diagnostic.

Table 7 reports Sun-Abraham interaction-weighted post-event estimates. These specifications address the standard concern that plain staggered event-study estimates can be contaminated when treatment effects are heterogeneous across cohorts (Sun and Abraham, 2021). In this application, the Sun-Abraham value-share estimates are weaker and fail the full-sample pretrend diagnostic. The quantity-share estimates remain positive



**Figure 8.** Matched cohort DiD event path: Greater China import quantity share  
Notes: Outcome is Greater China import quantity share in percentage points. The event year is the first high annual off-diagonal downstream exposure year. Direct same-sector investment rows are excluded.

and pass the preferred pretrend diagnostic, which is why the main text emphasizes the quantity-share outcome.

**Table 7.** Sun-Abraham Interaction-Weighted Estimates

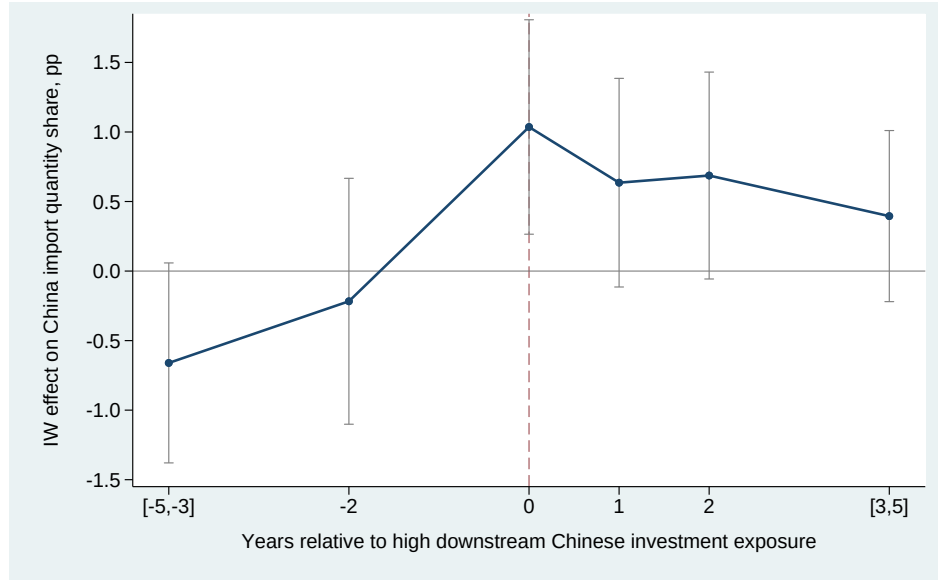
| Specification                         | Value share                     |                              |                                | Quantity share                  |                              |                                |
|---------------------------------------|---------------------------------|------------------------------|--------------------------------|---------------------------------|------------------------------|--------------------------------|
|                                       | (1)<br>No direct-sector control | (2)<br>Direct-sector control | (3)<br>Drop direct-sector rows | (4)<br>No direct-sector control | (5)<br>Direct-sector control | (6)<br>Drop direct-sector rows |
| <i>Panel A. Full sample</i>           |                                 |                              |                                |                                 |                              |                                |
| Post average, event years 0–5         | 0.431*<br>(0.249)               | 0.431*<br>(0.249)            | 0.383<br>(0.263)               | 0.612**<br>(0.282)              | 0.612**<br>(0.282)           | 0.559*<br>(0.297)              |
| Pretrend <i>p</i> -value              | < 0.001                         | < 0.001                      | < 0.001                        | 0.427                           | 0.427                        | 0.277                          |
| Treated post observations             | 7,443                           | 7,443                        | 6,508                          | 7,443                           | 7,443                        | 6,508                          |
| <i>Panel B. Manufacturing sectors</i> |                                 |                              |                                |                                 |                              |                                |
| Post average, event years 0–5         | 0.521*<br>(0.310)               | 0.521*<br>(0.310)            | 0.513*<br>(0.311)              | 0.715**<br>(0.349)              | 0.715**<br>(0.349)           | 0.702**<br>(0.349)             |
| Pretrend <i>p</i> -value              | < 0.001                         | < 0.001                      | < 0.001                        | 0.015                           | 0.015                        | 0.014                          |
| Treated post observations             | 4,283                           | 4,283                        | 4,273                          | 4,283                           | 4,283                        | 4,273                          |
| Country-sector FE                     | Yes                             | Yes                          | Yes                            | Yes                             | Yes                          | Yes                            |
| Year FE                               | Yes                             | Yes                          | Yes                            | Yes                             | Yes                          | Yes                            |
| BRI control                           | Yes                             | Yes                          | Abs.                           | Yes                             | Yes                          | Abs.                           |
| Direct-sector FDI control             | No                              | Yes                          | No                             | No                              | Yes                          | No                             |
| Direct-sector rows dropped            | No                              | No                           | Yes                            | No                              | No                           | Yes                            |

Notes: Estimates are Sun-Abraham interaction-weighted post averages for event years 0 through 5. The omitted event year is -1. Effects are percentage points of Greater China import share. Standard errors are clustered by country-sector. The table is included as a staggered-treatment robustness check; the matched cohort DiD estimates in Table 1 are the headline cumulative estimates. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Figure 9 reports the binned Sun-Abraham quantity-share event study for the full sample. The binned figure summarizes the timing pattern without relying on a large number of noisy relative-time coefficients.

China tightened capital controls and outbound investment screening around 2017. Table 8 splits treatment cohorts by whether their first high downstream-exposure year occurs before or after 2017. The pre-2017 point estimates are larger and more precise. Post-2017 point estimates are generally positive but noisier, and the difference is not stable enough to make capital controls the central claim.

Table 9 splits the clean vertical specification by host-country baseline GDP per capita.



**Figure 9.** Sun-Abraham binned event study: Greater China import quantity share  
Notes: Binned Sun-Abraham interaction-weighted estimates. The omitted event time is  $-1$ . The post average in Table 7 averages event years 0 through 5.

**Table 8.** Pre- and Post-2017 Cohort Split

| Same-sector handling     | Outcome  | Pre-2017 effect  | Post-2017 effect | Difference $p$ |
|--------------------------|----------|------------------|------------------|----------------|
| No direct-sector control | Value    | 1.858*** (0.361) | 0.541 (0.588)    | 0.054          |
| No direct-sector control | Quantity | 1.560*** (0.409) | 0.578 (0.739)    | 0.236          |
| Direct-sector control    | Value    | 1.858*** (0.361) | 0.538 (0.588)    | 0.054          |
| Direct-sector control    | Quantity | 1.560*** (0.409) | 0.573 (0.740)    | 0.234          |
| Drop direct-sector rows  | Value    | 1.944*** (0.367) | 0.630 (0.586)    | 0.057          |
| Drop direct-sector rows  | Quantity | 1.596*** (0.417) | 0.698 (0.742)    | 0.284          |

Notes: Split is by first high downstream-exposure cohort year. Pre-2017 cohorts have event year at or before 2016; post-2017 cohorts have event year 2017 or later. Effects are percentage points of Greater China import share.

The split uses average 2005–2007 GDP per capita, so development status is predetermined relative to most treatment events. The WDI-covered full-sample estimate remains positive. Across quartiles, the estimates do not imply a monotone development gradient: the lowest-income quartile has positive quantity and value point estimates, but only the value-share estimate is statistically significant, while the middle and higher-income quartiles are smaller and imprecise. I therefore treat this table as auxiliary heterogeneity evidence, not as part of the main aggregate result.

**Table 9.** Clean-vertical estimates by baseline GDP per capita quartile

| Group                                  | GDP pc (000s) | Countries | Coef.                                                                     | SE      | <i>p</i> -value | Pretrend <i>p</i> | Obs.   | Treated pairs |
|----------------------------------------|---------------|-----------|---------------------------------------------------------------------------|---------|-----------------|-------------------|--------|---------------|
| <i>Panel A. Quantity-share effects</i> |               |           |                                                                           |         |                 |                   |        |               |
| Full sample                            | 12.5          | 202       | 1.286***                                                                  | (0.373) | < 0.001         | 0.545             | 59,093 | 1,082         |
| Q1 (lowest)                            | 0.6           | 51        | 0.902                                                                     | (0.633) | 0.154           | 0.759             | 23,263 | 536           |
| Q2                                     | 2.3           | 50        | −0.288                                                                    | (0.780) | 0.711           | 0.252             | 10,813 | 191           |
| Q3                                     | 7.8           | 50        | 0.103                                                                     | (0.700) | 0.883           | 0.143             | 11,008 | 195           |
| Q4 (highest)                           | 39.1          | 49        | −0.155                                                                    | (0.613) | 0.800           | 0.517             | 9,393  | 160           |
| <i>Panel B. Value-share effects</i>    |               |           |                                                                           |         |                 |                   |        |               |
| Full sample                            | 12.5          | 202       | 1.485***                                                                  | (0.316) | < 0.001         | 0.418             | 59,093 | 1,082         |
| Q1 (lowest)                            | 0.6           | 51        | 1.173**                                                                   | (0.585) | 0.045           | 0.850             | 23,263 | 536           |
| Q2                                     | 2.3           | 50        | −0.419                                                                    | (0.517) | 0.417           | 0.687             | 10,813 | 191           |
| Q3                                     | 7.8           | 50        | 0.676                                                                     | (0.548) | 0.217           | 0.041             | 11,008 | 195           |
| Q4 (highest)                           | 39.1          | 49        | −0.486                                                                    | (0.477) | 0.308           | 0.910             | 9,393  | 160           |
| Cohort-entity FE                       |               |           |                                                                           |         |                 | Yes               |        |               |
| Cohort-year FE                         |               |           |                                                                           |         |                 | Yes               |        |               |
| Direct same-sector rows dropped        |               |           |                                                                           |         |                 | Yes               |        |               |
| Treatment threshold                    |               |           | Top quartile among positive normalized off-diagonal exposure observations |         |                 |                   |        |               |

Notes: The table reruns the matched cohort DiD clean vertical specification within country groups defined by baseline development status. GDP per capita quartiles are based on each host country’s average 2005–2007 World Development Indicators GDP per capita, current US dollars, ranked within the host countries in the aggregate panel (World Bank, 2026). The exposure cutoff is the same global 75th percentile of positive normalized off-diagonal downstream exposure used in Table 1; it is not recomputed within quartiles. Coefficients are percentage points of Greater China import share. Standard errors are clustered by country-sector. \* $p < 0.10$ , \*\* $p < 0.05$ , and \*\*\* $p < 0.01$ .

The preferred panel includes all verified project-activity matches, including remaining manual-review rows. Table 10 compares the main verified panel to a robustness panel that excludes remaining manual-review investment rows. The quantity-share effects remain positive after the exclusion. Some matched cohort pretrend diagnostics become less favorable, so I treat this as a stress test rather than the preferred sample.

**Table 10.** Manual-Review Match Robustness: Quantity Share

| Estimator          | Same-sector handling     | All rows | Excl. review | All-row pretrend <i>p</i> | Excl. pretrend <i>p</i> |
|--------------------|--------------------------|----------|--------------|---------------------------|-------------------------|
| Matched cohort DiD | Drop direct-sector rows  | 1.437*** | 1.558***     | 0.362                     | 0.010                   |
| Matched cohort DiD | No direct-sector control | 1.386*** | 1.515***     | 0.340                     | 0.007                   |
| Matched cohort DiD | Direct-sector control    | 1.385*** | 1.514***     | 0.342                     | 0.007                   |
| Sun-Abraham IW     | Direct-sector control    | 0.612**  | 0.674**      | 0.427                     | 0.254                   |
| Sun-Abraham IW     | No direct-sector control | 0.612**  | 0.674**      | 0.427                     | 0.254                   |
| Sun-Abraham IW     | Drop direct-sector rows  | 0.559*   | 0.619**      | 0.277                     | 0.150                   |

Notes: This table compares the verified-match main panel with a panel excluding remaining manual-review investment rows. Entries are quantity-share effects in percentage points.

## C. CONSTRUCTING THE DOWNSTREAM-PULL SCORE

This appendix describes the downstream-pull score used in the investment allocation exercise. The score is meant to capture, before observing an FDI position, whether a downstream investment in a host country and sector has high potential to create demand for Chinese upstream suppliers. It is not an estimate of an approval rule. The paper does not observe rejected applications, review files, or the information set of Chinese regulators. The score is therefore used as a predicted complementarity measure: if the state or state-influenced investors value home-supplier benefits, realized Chinese outward FDI should be more concentrated than peer FDI in markets with high predicted downstream pull.

### C.1 Inputs

The construction combines three observed objects. First, BACI trade flows give lagged country-level demand and Chinese export capability by upstream sector (CEPII, 2026). Second, OECD ICIO tables give fixed production links between upstream input sectors and downstream using sectors (Organisation for Economic Co-operation and Development, 2025a). Third, the World Bank Group sectoral bilateral FDI database gives realized outward FDI stocks by source country, host country, sector, and year for 2008–2019 (Steenbergen et al., 2022).

Let  $d$  denote a host country,  $t$  an FDI year,  $u$  an upstream ICIO parent sector, and  $p$  a downstream ICIO parent sector. Trade variables are measured in year  $t - 1$ , so the score is predetermined relative to the FDI stock observed in year  $t$ . Let  $X_{u,t-1}^{CHN,-d}$  denote China's exports of upstream sector  $u$  to all destinations other than  $d$ . Let  $X_{u,t-1}^{WLD,-(CHN,d)}$  denote world exports in sector  $u$  after excluding the China-to- $d$  bilateral flow. China's dyad-excluded export capability in sector  $u$  is

$$Cap_{d,u,t-1}^{CHN} = \frac{X_{u,t-1}^{CHN,-d}}{X_{u,t-1}^{WLD,-(CHN,d)}}.$$

This term is high when China is an important global supplier of upstream sector  $u$ , but it deliberately removes exports from China to host country  $d$ .

Let  $M_{u,t-1}^{d,-CHN}$  denote host country  $d$ 's imports of upstream sector  $u$  from all sources other than China. The product

$$Cap_{d,u,t-1}^{CHN} M_{u,t-1}^{d,-CHN}$$

is high when the host country buys upstream input  $u$  and China has capacity to supply that input globally. Removing the China-host bilateral flow matters: the score should not be mechanically high simply because the host already imports a lot from China.

The ICIO tables then translate upstream import demand into downstream-sector relevance. Let  $a_{up}$  be the fixed world input-output coefficient from upstream sector  $u$  into downstream sector  $p$ . It is computed as intermediate use of  $u$  by  $p$ , divided by gross output of the using sector  $p$ , using the chosen ICIO coefficient window. The baseline uses a fixed 2005–2007 matrix; the robustness checks use a fixed 2008–2010 matrix and rolling three-year lagged matrices.

## C.2 Score

At the ICIO-parent level, the China downstream-pull score for downstream sector  $p$  in host country  $d$  and year  $t$  is

$$MP_{dpt}^{CHN} = \sum_u a_{up} \left( Cap_{d,u,t-1}^{CHN} M_{u,t-1}^{d,-CHN} \right).$$

The score is high when three conditions hold at the same time: China is a large global supplier of the relevant upstream input, the host country imports that input from the rest of the world, and the downstream sector uses that input intensively in production.

The World Bank FDI data are reported in broader sector categories than the ICIO parent industries. I therefore map ICIO parent industries into the World Bank sector classification and sum the parent-level scores within each World Bank sector. If  $\mathcal{P}(j)$  is the set of ICIO parent industries mapped to World Bank sector  $j$ , the score used in the allocation regressions is

$$MP_{djt}^{CHN} = \sum_{p \in \mathcal{P}(j)} MP_{dpt}^{CHN}.$$

The raw score is right-skewed, so the regression uses  $\log(1 + MP_{djt}^{CHN})$  standardized within year. The main standardized score therefore compares host-sector markets in the same year. I also construct a year-sector standardized version, which compares host countries within the same broad sector and year, and a top-quartile indicator for markets with especially high downstream pull.

The allocation regressions also control for an upstream-security score. That score is built from the same archived framework, but it captures a different idea: whether the host country is useful as a source of upstream inputs for China. I keep this object as a control and robustness check. The headline mechanism in this paper is downstream pull, not upstream resource security.

## C.3 Why this construction is useful

The score is useful because it matches the economic mechanism and the limits of the available data. The model says that downstream outward FDI is more valuable to the home country when it can activate demand for home-country upstream suppliers. The

score measures exactly the ingredients needed for that channel: China’s ability to supply an upstream input, the host market’s demand for that input, and the production link between the input and the downstream sector in which FDI is recorded.

The timing and exclusions are important. Lagging BACI trade by one year makes the score predetermined relative to the FDI outcome. Using fixed pre-period ICIO coefficients avoids building the score from production links that may themselves respond to the investment episode. Excluding the China-host bilateral trade flow prevents the score from simply rediscovering existing China-host trade relationships. In words, the score asks whether the host country was already buying inputs from the world that China was capable of supplying elsewhere.

The source comparison is also intentional. All source countries in the allocation panel are evaluated against the same China-specific score. This is the right benchmark for the hypothesis in the paper. The question is not whether every country invests where its own suppliers are strong. The question is whether China, relative to comparable source countries, places more outward FDI in host-sector markets that are complementary to China’s upstream industrial base. Source-year fixed effects absorb the overall scale of each source country’s outward FDI in each year, destination-year fixed effects absorb common host-country attractiveness, and sector-year fixed effects absorb global sector shocks.

Several limitations remain. The score is a proxy for expected supplier-network benefits, not a direct measure of state approval. BACI measures goods trade more directly than services, and the World Bank FDI sectors are broad. The year-sector standardized specification addresses part of the concern that the result could be driven by broad sector composition, but it is less precisely estimated. For this reason, the paper treats the allocation evidence as a descriptive bridge: it shows that realized Chinese outward FDI is concentrated where the downstream-pull mechanism should be stronger, while the aggregate and firm-level designs test the sourcing response after investment is realized.

## D. INVESTMENT ALLOCATION: DESCRIPTIVE OVERLAP

### D.1 Country-level overlap

The regression evidence uses the full allocation panel. As a simple geographic check, I also collapse the China-specific downstream-pull score to the destination level by averaging over sector-country-year observations. This collapse discards sector variation, so it should be read only as a descriptive summary. It is useful, however, for asking whether the places predicted to have high downstream pull are also the places where Chinese outward FDI is most concentrated.

Table 11 shows a sharp overlap. Of 200 destinations, 34 have positive Chinese outward

FDI stock in the World Bank sectoral FDI data. Twenty-four of these 34 destinations are in the top quartile of average downstream-pull scores. The overlap is even stronger at the top of the FDI distribution: all nine top-FDI destinations are also in the top pull quartile. The country-level correlation between average pull and log Chinese FDI stock is 0.41 across all destinations and 0.62 among destinations with positive Chinese FDI stock. The corresponding rank correlations are 0.48 and 0.88.

**Table 11.** Country-level overlap between downstream-pull scores and realized Chinese outward FDI

| <i>Panel A. Realized Chinese FDI by pull-score quartile</i> |              |          |           |         |                |
|-------------------------------------------------------------|--------------|----------|-----------|---------|----------------|
| Quartile                                                    | Destinations | Positive | Share (%) | Top-FDI | Mean log stock |
| Q1 lowest                                                   | 50           | 2        | 4.0       | 0       | 0.15           |
| Q2                                                          | 50           | 1        | 2.0       | 0       | 0.05           |
| Q3                                                          | 50           | 7        | 14.0      | 0       | 0.63           |
| Q4 highest                                                  | 50           | 24       | 48.0      | 9       | 4.09           |

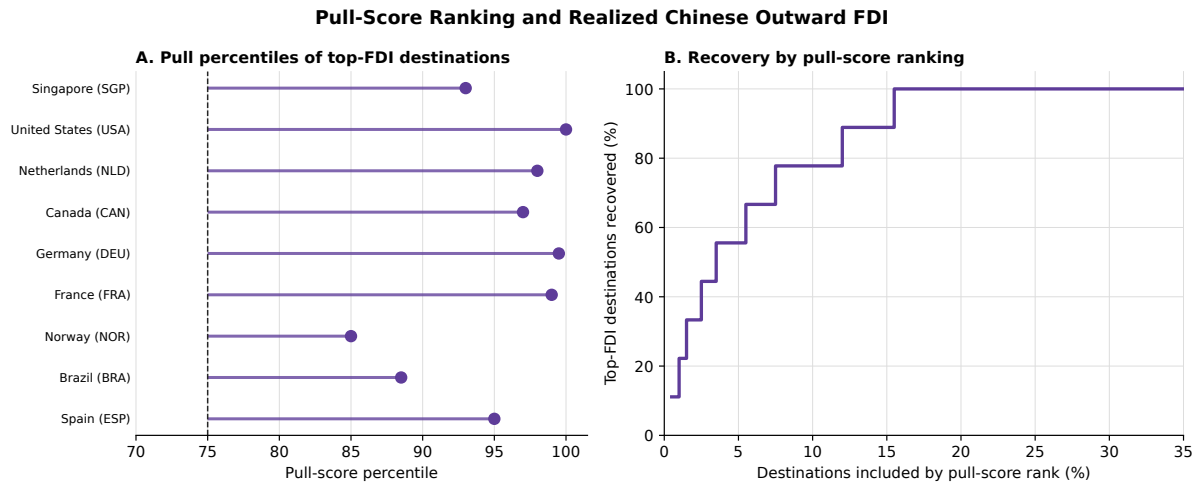
| <i>Panel B. Association diagnostics</i>                      |                  |
|--------------------------------------------------------------|------------------|
| Destinations                                                 | 200              |
| Destinations with positive Chinese FDI stock                 | 34               |
| Positive-stock destinations in the top pull quartile         | 24 of 34 (70.6%) |
| Top-FDI destinations in the top pull quartile                | 9 of 9 (100.0%)  |
| Correlation, all destinations: Pearson / Spearman            | 0.41 / 0.48      |
| Correlation, positive-stock destinations: Pearson / Spearman | 0.62 / 0.88      |

Notes: The table aggregates the China-specific downstream-pull score to the destination level by averaging over sector-country-year observations from 2008–2019. Top-FDI destinations are the top quartile among destinations with positive Chinese outward FDI stock. FDI stocks are summed over years and sectors in the World Bank Group sectoral FDI data. Mean log stock is the average of  $\log(1 + \text{stock})$ .

Figure 10 presents the same fact as a ranking exercise. Panel A plots the pull-score percentile of the largest realized Chinese-FDI destinations. Each lies above the 75th percentile. Panel B sorts destinations by the pull score and traces the cumulative share of top-FDI destinations recovered as the ranking expands. By the top-quartile cutoff, the ranking recovers all nine top-FDI destinations.

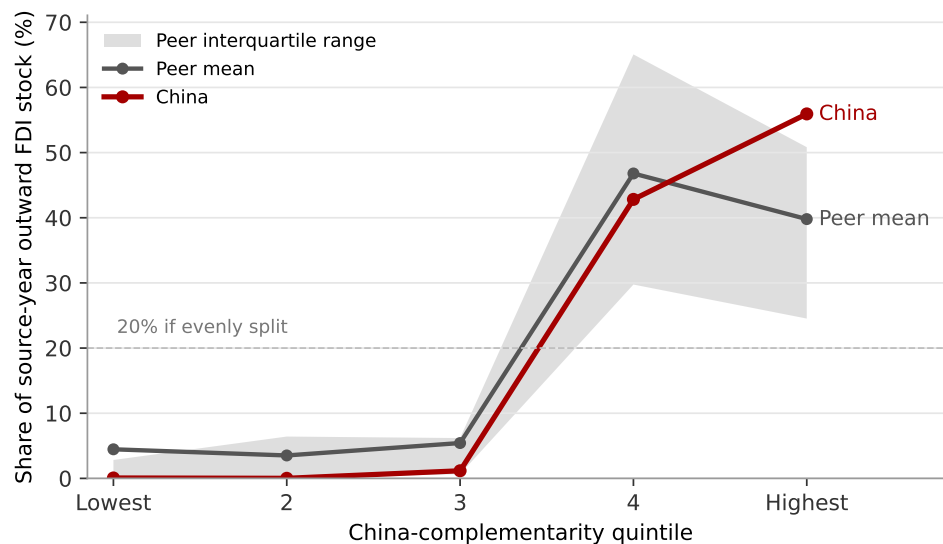
## D.2 Portfolio sort across destination-sector-year observations

Figure 11 provides a descriptive portfolio-sort version of the allocation result in Table 3. I sort destination-sector-year observations into five equal-count bins by China-complementarity, separately within each year, and compute the share of each source-year's outward FDI stock in each bin. China places 56 percent of its outward FDI stock in the highest-complementarity quintile, compared with 40 percent for the peer mean. The lowest three quintiles account for less than 2 percent of China's stock, compared with 13 percent for peers.



**Figure 10.** Country-level rank overlap between downstream-pull scores and Chinese outward FDI

Notes: The figure aggregates the China-specific downstream-pull score to the destination level by averaging over sector-country-year observations, 2008–2019. Top-FDI destinations are the top quartile among destinations with positive Chinese outward FDI stock, where stocks are summed over years and sectors in the World Bank Group sectoral FDI data. In Panel B, destinations are ordered from highest to lowest downstream-pull score. The dashed vertical line in Panel A marks the 75th percentile threshold.

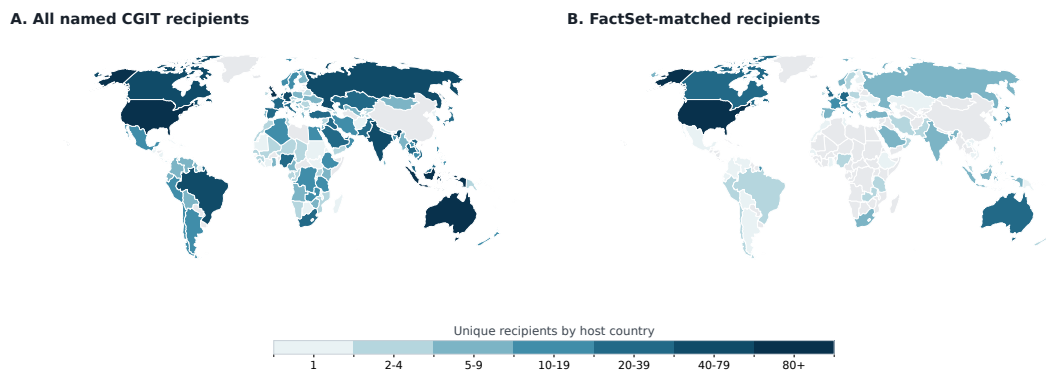


**Figure 11.** Outward FDI stock by China-complementarity quintile

Notes: Destination-sector-year observations are sorted into five equal-count bins by the China downstream-pull complementarity score within year. For each source-year, the figure computes the share of outward FDI stock in each bin, then averages those shares across years for China and across source-years for the selected peer economies. The shaded region is the peer interquartile range.

## E. FIRM-LEVEL NETWORK MEASURES AND MATCHING BALANCE

Table 12 reports the match funnel from CGIT transaction rows to FactSet recipient firms and the two estimation samples used in the mechanism analysis. Table 13 reports summary statistics for the 398 unique matched recipient firms. The firm-level design matches treated recipient events to controls from the same host country. Table 14 reports selected balance diagnostics. Standardized differences are generally small in the preferred all-symmetric sample, including the key upstream exposure difference.



**Figure 12.** Geographic distribution of CGIT recipients and matched CGIT-FactSet recipient firms

Notes: Panel A maps unique named CGIT transaction parties by host country. Panel B maps unique recipient firms whose CGIT transaction party can be matched to a FactSet company identifier. Matched counts are based on each recipient's first Chinese-investment event. The comparison is descriptive: FactSet coverage is stronger in host economies with richer firm-level identifier and relationship data, so the matched panel is not meant to mirror the full geographic distribution of CGIT recipients. The map describes match coverage before imposing the balanced-window restrictions used in the main event-study sample.

**Table 12.** Firm-level match and estimation-sample construction

| Sample step                                        | Unit            | Count |
|----------------------------------------------------|-----------------|-------|
| CGIT Dataset 1+2 project rows, 2005–2024           | Deal rows       | 4,652 |
| Rows with named transaction party                  | Deal rows       | 2,289 |
| Accepted recipient-matched rows                    | Deal rows       | 511   |
| Unique matched recipient firms / first events      | Firms           | 398   |
| All-symmetric estimation sample                    | Treated firms   | 369   |
| All-symmetric estimation sample: controls          | Control firms   | 1,073 |
| All-symmetric estimation sample: matched cohorts   | Matched cohorts | 369   |
| All-symmetric estimation sample: host countries    | Countries       | 64    |
| Active-pre/post estimation sample                  | Treated firms   | 150   |
| Active-pre/post estimation sample: controls        | Control firms   | 696   |
| Active-pre/post estimation sample: matched cohorts | Matched cohorts | 150   |
| Active-pre/post estimation sample: host countries  | Countries       | 42    |

Notes: The table reports the construction of the firm-level mechanism sample. Recipient matches link CGIT transaction parties to FactSet company identifiers. The all-symmetric sample requires a complete  $[-3, 3]$  event window around the first Chinese-investment event. The active-pre/post sample additionally requires observed supplier activity before and after treatment.

**Table 13.** Summary statistics for matched recipient firms

| Variable                                    | Mean   | Std. dev. | Median | N   |
|---------------------------------------------|--------|-----------|--------|-----|
| Matched recipient firms                     |        | 398       |        |     |
| Host countries                              |        | 70        |        |     |
| Regions                                     |        | 9         |        |     |
| CGIT sectors                                |        | 14        |        |     |
| Event-year range                            |        | 2005–2024 |        |     |
| Event project value, USD millions           | 637.34 | 1,117.96  | 280.00 | 398 |
| Share-size observed                         | 61.6%  | 48.7%     | 100.0% | 398 |
| Majority-stake transaction                  | 33.9%  | 47.4%     | 0.0%   | 398 |
| Minority-stake transaction                  | 27.6%  | 44.8%     | 0.0%   | 398 |
| Greenfield project                          | 8.5%   | 28.0%     | 0.0%   | 398 |
| BRI project                                 | 69.8%  | 45.9%     | 100.0% | 398 |
| Average pre-period supplier count           | 5.32   | 17.59     | 0.00   | 398 |
| Average post-period supplier count          | 7.82   | 22.13     | 0.83   | 398 |
| Any pre-period supplier link                | 46.2%  | 49.9%     | 0.0%   | 398 |
| Any post-period supplier link               | 59.8%  | 49.1%     | 100.0% | 398 |
| Observed supplier activity before and after | 40.7%  | 49.2%     | 0.0%   | 398 |

Notes: The unit is a unique matched recipient firm, measured at the first Chinese-investment event observed in the CGIT-FactSet match. Project value is the CGIT reported quantity in millions of current US dollars. Supplier-count variables average annual FactSet Revere supplier links over event years  $[-3, -1]$  and  $[1, 3]$ .

The control group is constructed separately for each treated recipient-event cohort. I first restrict candidate controls to covered non-recipient firms in the same host country, require ticker information, and exclude any firm identified as a CGIT recipient. I then measure the candidate’s network position over event years  $-3$  to  $-1$  relative to the treated recipient’s investment year. The matching variables are log average supplier count, the supplier-count trend between event years  $-3$  and  $-1$ , direct Greater China supplier share, China-exposed supplier share, average supplier Greater China buyer exposure, upstream China-linked supplier share, and average supplier Greater China supplier exposure. For each treated recipient, the algorithm standardizes these variables by the dispersion among candidate controls in the same host country and event year, sums squared standardized differences, and keeps up to five nearest controls. Control firms can appear in multiple matched cohorts, but they are never firms that are themselves identified recipient matches. This construction keeps the comparison within host country and uses only pre-treatment network information; it does not match on post-treatment supplier changes.

### E.1 Embedding-Index Construction

Let  $S_{it}$  denote the set of observed first-tier suppliers of firm  $i$  in year  $t$ , let  $G$  denote firms headquartered in mainland China, Hong Kong, or Macau, let  $B_{st}$  denote the observed buyers of supplier  $s$ , and let  $U_{st}$  denote the observed suppliers of supplier  $s$ . The direct Greater China supplier share is  $|S_{it} \cap G|/|S_{it}|$ . The indirect index used in the main text excludes that direct supplier share and instead summarizes whether the recipient’s first-tier suppliers are themselves connected to Greater China. The underlying links are

**Table 14.** Selected pre-period matching balance

| Sample          | Metric                               | Treated mean | Control mean | Std. difference |
|-----------------|--------------------------------------|--------------|--------------|-----------------|
| All symmetric   | Log supplier count                   | 0.749        | 0.688        | 0.057           |
| All symmetric   | Supplier-count trend                 | 0.820        | 0.733        | 0.025           |
| All symmetric   | Direct GC supplier share             | 0.007        | 0.003        | 0.129           |
| All symmetric   | China-exposed supplier share         | 0.127        | 0.113        | 0.067           |
| All symmetric   | Average supplier GC-buyer share      | 0.010        | 0.007        | 0.140           |
| All symmetric   | Upstream China-linked supplier share | 0.055        | 0.049        | 0.050           |
| All symmetric   | Average supplier GC-supplier share   | 0.010        | 0.006        | 0.137           |
| Active pre/post | Log supplier count                   | 1.768        | 1.659        | 0.100           |
| Active pre/post | Direct GC supplier share             | 0.017        | 0.008        | 0.214           |
| Active pre/post | China-exposed supplier share         | 0.270        | 0.245        | 0.106           |
| Active pre/post | Upstream China-linked supplier share | 0.119        | 0.109        | 0.065           |

Notes: Variables are measured in the pre-period. Greater China is mainland China, Hong Kong, and Macau. The active-pre/post sample is more restrictive because it conditions on observed supplier activity before and after treatment.

directed FactSet Revere supplier-customer relationships annualized over the relationship start and end dates (FactSet Research Systems Inc., 2025). I deduplicate links at the firm-supplier-year level before constructing outcomes. The two-hop measures follow the production-network view that realized firm-to-firm links are economically meaningful channels of market access and propagation (Chaney, 2014; Bernard, Moxnes, et al., 2019); unlike transaction data, however, FactSet records relationships rather than shipment values, prices, or product quantities.

The share and intensity components scale to the recipient’s observed first-tier supplier count, either by using  $|S_{it}|$  as the denominator or by averaging over  $S_{it}$ . This keeps the scale of the outcomes comparable and avoids conditioning on a post-treatment subset of suppliers. The two extensive-margin components restrict attention to non-Greater-China first-tier suppliers. The four intensity and path components are computed over the full observed first-tier supplier neighborhood because they measure the density of Greater China links surrounding that neighborhood, not only the nationality of the recipient’s own suppliers. The path components count two-hop links rather than dividing by  $|S_{it}|$ , and are transformed using the inverse hyperbolic sine.

The buyer-side components are:

$$IndirectDown_{it} = \frac{|\{s \in S_{it} \setminus G : B_{st} \cap G \neq \emptyset\}|}{|S_{it}|}, \quad (18)$$

$$BuyerShare_{it} = \frac{1}{|S_{it}|} \sum_{s \in S_{it}} \frac{|B_{st} \cap G|}{|B_{st}|}, \quad (19)$$

$$BuyerPaths_{it} = \operatorname{asinh} \left( \sum_{s \in S_{it}} |B_{st} \cap G| \right). \quad (20)$$

$IndirectDown_{it}$  is the extensive-margin share of the recipient’s supplier base made up of non-Greater-China first-tier suppliers that sell to at least one Greater China buyer.

$BuyerShare_{it}$  averages, across the recipient's first-tier suppliers, the share of each supplier's observed buyers that are in Greater China. The inner ratio is set to zero when supplier  $s$  has no observed buyers in year  $t$ .  $BuyerPaths_{it}$  measures the total number of observed two-hop paths from the recipient through its suppliers to Greater China buyers; the same Greater China buyer contributes multiple paths if it is reached through multiple first-tier suppliers. The inverse hyperbolic sine transformation keeps zero path counts in the sample while reducing the influence of very highly connected suppliers.

The supplier-side components are:

$$NonGCU_{it} = \frac{|\{s \in S_{it} \setminus G : U_{st} \cap G \neq \emptyset\}|}{|S_{it}|}, \quad (21)$$

$$SupplierShare_{it} = \frac{1}{|S_{it}|} \sum_{s \in S_{it}} \frac{|U_{st} \cap G|}{|U_{st}|}, \quad (22)$$

$$SupplierPaths_{it} = \text{asinh} \left( \sum_{s \in S_{it}} |U_{st} \cap G| \right). \quad (23)$$

$NonGCU_{it}$  is the extensive-margin share of the recipient's supplier base made up of non-Greater-China first-tier suppliers that themselves source from at least one Greater China supplier.  $SupplierShare_{it}$  averages, across the recipient's first-tier suppliers, the share of each supplier's own observed suppliers that are in Greater China. The inner ratio is set to zero when supplier  $s$  has no observed suppliers in year  $t$ .  $SupplierPaths_{it}$  measures the total number of observed two-hop paths from the recipient through its suppliers to Greater China suppliers, again applying the inverse hyperbolic sine transformation to the path count.

Each component is standardized using the matched-control pre-period distribution:

$$Z_{it}^m = \frac{Y_{it}^m - \mu_{0,pre}^m}{\sigma_{0,pre}^m}, \quad \tau \in \{-3, -2, -1\}, \quad Treated = 0. \quad (24)$$

The mean  $\mu_{0,pre}^m$  and standard deviation  $\sigma_{0,pre}^m$  are computed among matched control firms in event years  $-3$  to  $-1$ . If  $\sigma_{0,pre}^m$  is zero, I set it to one before standardization so that a constant component does not mechanically dominate the index. Shares with empty denominators are coded as zero before standardization. The path-count components are transformed using the inverse hyperbolic sine before standardization, so those  $Z$ -scores compare changes in sparse path counts without allowing a few highly connected suppliers to dominate the index. Averaging standardized components follows the summary-index approach of [Kling et al. \(2007\)](#): it improves readability and reduces multiple-testing pressure, while the identifying variation remains the matched event-study design rather than the index weights.

The broad index combines direct and indirect China proximity:

$$BroadEmbed_{it} = \frac{1}{7} \left( Z_{it}^{Direct} + Z_{it}^{Exposed} + Z_{it}^{BuyerShare} + Z_{it}^{BuyerPaths} + Z_{it}^{Upstream} + Z_{it}^{SupplierShare} + Z_{it}^{SupplierPaths} \right). \quad (25)$$

In this broader measure,  $Z_{it}^{Direct}$  standardizes the recipient's own direct Greater China supplier share.  $Z_{it}^{Exposed}$  standardizes the share of all first-tier suppliers, including Greater China suppliers, that sell to at least one Greater China buyer.  $Z_{it}^{Upstream}$  standardizes the share of all first-tier suppliers, including Greater China suppliers, that source from at least one Greater China supplier. The remaining four components are the buyer-side and supplier-side intensity and path-count measures defined above.

The main text emphasizes the indirect index in equation (16) because it excludes the recipient's direct Greater China supplier share and therefore better captures supplier-neighborhood integration. Relative to the broad index, the indirect index replaces  $Z_{it}^{Exposed}$  with the standardized share of non-Greater-China first-tier suppliers that sell to Greater China buyers and replaces  $Z_{it}^{Upstream}$  with the standardized share of non-Greater-China first-tier suppliers that source from Greater China.

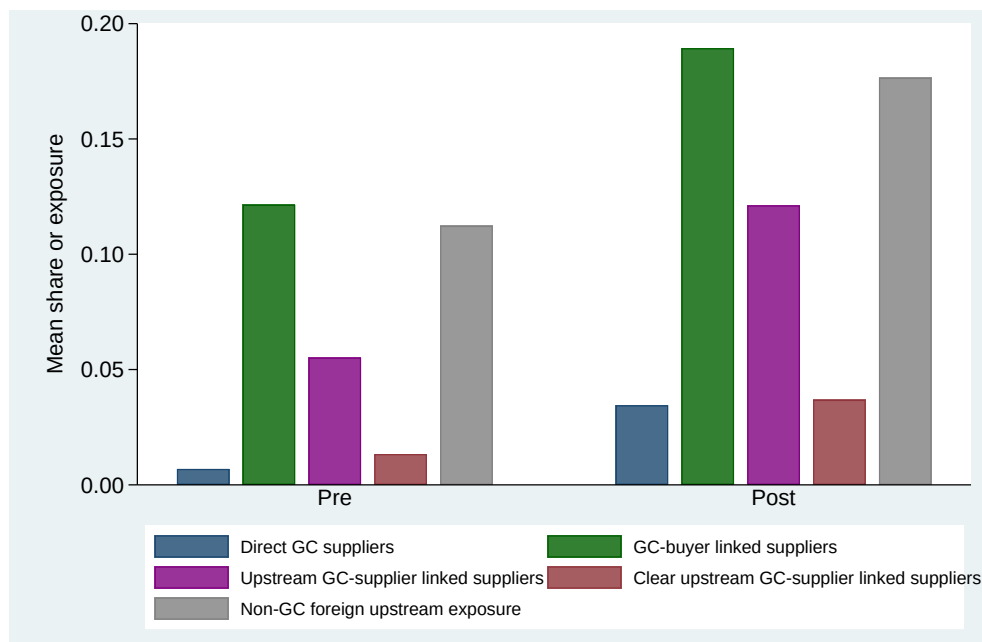
## F. ADDITIONAL MECHANISM DIAGNOSTICS

Figure 13 provides a descriptive decomposition around the investment event. It separates direct Greater China suppliers, indirect Greater-China-buyer-linked suppliers, upstream Greater-China-supplier-linked suppliers, and non-Greater-China foreign upstream exposure. I use this decomposition as supporting evidence rather than causal evidence: the event-study figures are the preferred estimates.

Figure 14 reports one component of the indirect embedding index: the share of a recipient's non-Greater-China first-tier suppliers that also sell to at least one Greater China buyer. This is the extensive margin behind the buyer-side part of the index. It is useful because it shows the same object in raw share units rather than standardized index units.

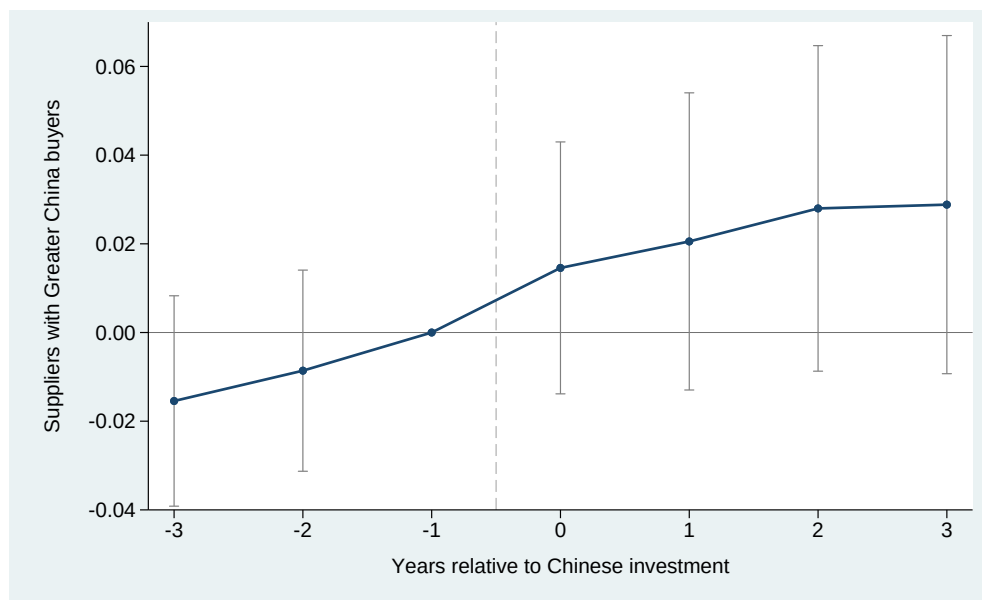
## G. SUPPLIER REORIENTATION TAXONOMY AND CASE-STUDY MATERIAL

For each treated recipient, I compare the union of suppliers in the pre-window  $[-3, -1]$  to the union of suppliers in the post-window  $[1, 3]$ . A “switching-consistent” event is one in which the firm adds at least one new Greater China supplier and also drops at least



**Figure 13.** Direct, indirect, and upstream China exposure

Notes: The figure reports pre/post means for treated recipient events. The pre-window is  $[-3, -1]$  and the post-window is  $[1, 3]$ . Event year 0 is excluded.



**Figure 14.** Suppliers with Greater China buyers

Notes: The outcome is the share of a recipient's observed first-tier suppliers that are not located in Greater China and that also sell to at least one buyer located in Greater China. The omitted event time is  $-1$ . Standard errors are clustered by firm.

one pre-period non-Greater-China supplier:

$$SwitchingCandidate_i = \min(|NewGC_i|, |DroppedNonGC_i|). \quad (26)$$

This is not a one-for-one contract replacement test because I do not observe contract termination or product-level substitution. It is a conservative network diagnostic for supplier reorientation.

**Table 15.** Supplier reorientation taxonomy

| Taxonomy                                      | Recipient events |
|-----------------------------------------------|------------------|
| Switching-consistent                          | 43               |
| Direct Greater China expansion only           | 18               |
| Retained Greater China relationship only      | 1                |
| Non-Greater-China supplier consolidation only | 106              |
| No direct Greater China change                | 203              |
| Total                                         | 371              |

Notes: Switching-consistent events are recipient events in which new post-investment Greater China suppliers appear alongside dropped non-Greater-China suppliers. The taxonomy is descriptive and should not be read as proof of contract-level replacement.

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