2nd Junior Workshop in Geoeconomics

Reshoring Policies in the Intangible Economy

Jiyoung Lee

University of Washington

Bank of Korea (On Leave)

Research Question

- How do reshoring policies affect offshoring decisions and aggregate macroeconomic outcomes in the presence of intangible capital?

  Ex. Reshoring subsidies (One Big Beautiful Bill Act, Section 174A), Strategic tariffs (Section 301)

Reshoring Policies in the Intangible Economy

- US Reshoring Policies: Revitalizing economy via intangible-intensive manufacturing

  Ex. CHIPS Act (2022), Section 301 (2018), One Big Beautiful Bill Act (2025)

- The Challenge: Reshoring of cost-efficient plants $\rightarrow$ Resource misallocation

- Intangible Scalability: Shifts profitability & redefines global disintegration inefficiency

  – Industrial policies targeting intangible-intensive sectors $\rightarrow$ Economies of scale (Goldberg et al., 2024)

Contribution

- Evaluates reshoring policies and welfare by integrating intangible scalability into an offshoring GE model with endogenous firm dynamics.
- Theorizes how reshoring policies restructure GVCs by incorporating the scalability of intangible capital.

Current Findings

- **Subsidies**: Medium-run **Consumption & Output** $\uparrow$
  - Lump-sum Subsidies: Reshores less productive firms $\rightarrow$ Labor demand$\uparrow$ $\rightarrow$ Wages$\uparrow$ $\rightarrow$ Largest boost to consumption and output
  - Tax Credits: Generated the highest reshoring VA by incentivizing high-productivity firms to reshore.
- **Tariffs**: **Consumption** $\uparrow$ (via rebates) but **Output** $\downarrow$ (via dampened trade & Offshore VA)
- Reshoring policies induce **transitional welfare gains** through scalability.

Literature

- **Trade, Offshoring, RER**: Barattieri, Cacciatore, and Ghironi (2021), Bernard, Fort, Smeets, and Warzynski (2020), Bøler, Moxnes, and Ulltveit-Moe (2015), Ghironi and Melitz (2005), Gumpert, Manova, Rujan, and Schnitzer (2025), Liu (2024), Mejean (2008), Melitz (2003), Zlate (2010, 2016)

  $\rightarrow$ **Endogenize intangible capital investment** in offshore production.

- **Intangible Capital and Productivity**: Corrado, Hulten, and Sichel (2006), Crouzet, Eberly, Eisfeldt, and Papanikolaou (2022), De Ridder (2024), Griliches (1998), Haskel and Westlake (2018)

  $\rightarrow$ **Extends intangible scalability from domestic to offshoring** models within a location choice framework.

- **Reshoring, Industrial Policies (IP)**: Alfaro and Chor (2023), Barwick, Kalouptsidi, and Zahur (2019), Criscuolo, Gonne, Kitazawa, and Lalanne (2022), Evenett, Jakubik, Martin, and Ruta (2024), Grossman, Helpman, and Redding (2023), Goldberg, Juhász, Lane, Lo Forte, and Thurk (2024), Grossman, Helpman, and Sabal (2023), Juhász, Lane and Rodrik (2024)

  $\rightarrow$ **Evaluating reshoring policies** within an offshoring framework that incorporates the scalability of intangibles.

Model Assumptions

The model's assumptions are based on Ghironi and Melitz (2005), Zlate (2010), and De Ridder (2024):

- Two economies (Home, Foreign) with a representative HH
- A continuum of monopolistically competitive firms with heterogeneous labor productivity
- Flexible wages
- Vertical FDI:
  - Home firms: Choice between domestic vs. offshore production
  - Foreign firms: Domestic production only (due to Home's higher effective labor cost)
  - A subset of firms from each economy also export to the foreign market

The Household's Problem

- The representative household in Home maximizes:

$$E_t \sum_{s=t}^{\infty} \beta^{s-t} \frac{C_s^{1-\gamma}}{1-\gamma}, \quad \beta \in (0,1), \gamma > 0 \tag{1}$$

subject to the budget constraint:

$$B_{t+1} + v_t(N_t + N_{E,t})x_{t+1} + C_t = (1+r_t)B_t + (v_t + d_t)N_t x_t + w_t L \tag{2}$$

- The consumption basket: $C_t = \left(\int_{\omega \in \Omega} c_t(\omega)^{\frac{\theta-1}{\theta}} d\omega \right)^{\frac{\theta}{\theta-1}}$ (3)
- The consumption-based price: $P_t = \left(\int_{\omega \in \Omega_t} p_t(\omega)^{1-\theta} d\omega \right)^{\frac{1}{1-\theta}}$ (4)
- The household's demand: $c_t = \left(p_t(\omega)/P_t \right)^{-\theta} C_t = \rho_t^{-\theta} C_t$ (5)

Firms

- After entry, firms draw productivity z independently from a common distribution $G(z)$.
- Time-to-build lag; exogenous ”death” shock with probability δ at the end of each period.

  $\Rightarrow$ The law of motion: $N_{t+1} = (1 - \delta)(N_t + N_{E,t})$ (6)
- Entry cost: Sunk entry costs $f_{E,t}$ in units of effective labor
- Offshoring cost: Fixed cost $f_{V,t}$ & iceberg trade cost $\tau_t \geq 1$
- Exporting cost: Fixed cost $f_{X,t}$ & iceberg trade cost $\tau_t \geq 1$

Intangible Costs

- Firms can engage in intangible capital investment that lowers marginal costs (De Ridder, 2024). [5]
- If firm z does not do intangible capital investment:

$$mc_t(z) = \frac{w_t}{Z_t z} \tag{7}$$

- If firm z does intangible capital investment ($\psi_t < 1$):

$$mc_t(z) = \psi_t^{\xi} \frac{w_t}{Z_t z} \tag{8}$$

- Intangible capital investment implied fixed costs:

$$\phi_t \frac{w_t}{Z_t} (\psi_t^{-\xi} - 1) \tag{9}$$

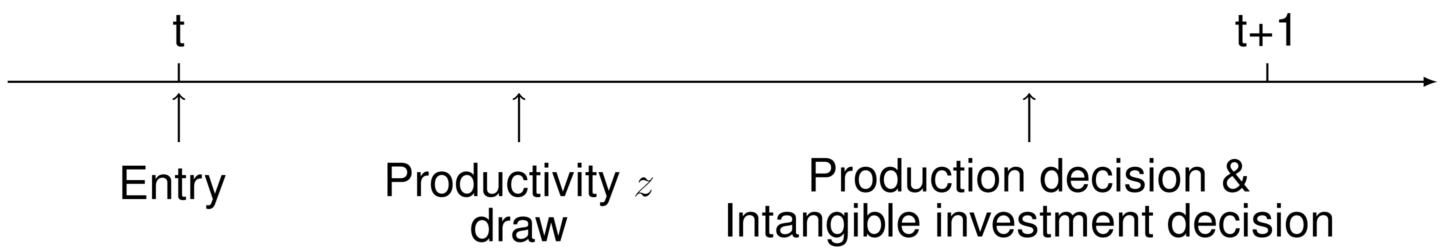
ϕ_t: Share of intangible costs in total costs ($\phi_t < 1$), $\xi > 0$

Intangible Investment Decision

- Firms undertake intangible investment only when the profits exceed those without intangible investment.

$$d^{I}_{D,t}(z) \geq d^{NI}_{D,t}(z) \tag{10}$$

The Timing of Production Decisions



After entry :

- Firms draw productivity $z \sim G(z)$
- Firms choose production methods based on productivity.
  - 1) Intangible investment: marginal costs$\downarrow$ & fixed costs
  - 2) No intangibles: baseline marginal costs
  - 3) Offshore with intangibles: marginal costs$\downarrow$ & fixed costs, offshore production
- Firms set prices and quantities.

Production and Demand

- Domestic production: $y_{D,t}(z) = Z_t z l_t(z)$ (11)

- Offshore production: $y_{V,t}(z) = Z_t^* z l_t^*(z)$ (12)

- Export production: $y_{X,t}(z) = Z_t z l_{X,t}(z)$ (13)

- The demand function for the variety:

$$y_{D,t}(z) = \rho_{D,t}(z)^{-\theta} C_t \tag{14}$$

$$y_{V,t}(z) = \rho_{V,t}(z)^{-\theta} C_t \tag{15}$$

$$y_{X,t}(z) = \rho_{X,t}(z)^{-\theta} C_t^* \tag{16}$$

Profits (Home)

- Domestic:
  - With intangible investment,

$$\max_{\{\rho_{D,t}(z)\}} d_D^I(z) = \left(\rho_{D,t}(z) - \psi_{D,t}^{\xi} \frac{w_t}{Z_t z}\right) y_{D,t}(z) - \phi_{D,t} \frac{w_t}{Z_t}(\psi_{D,t}^{-\xi} - 1) \quad (17)$$

  - W/O intangible investment,

$$\max_{\{\rho_{D,t}(z)\}} d_D^{NI}(z) = \left(\rho_{D,t}(z) - \frac{w_t}{Z_t z}\right) y_{D,t}(z) \quad (18)$$

- Offshoring: [6]
  - With intangible investment,

$$\max_{\{\rho_{V,t}(z)\}} d_V(z) = \left(\rho_{V,t}(z) - \tau Q_t \psi_{V,t}^{\xi} \frac{w_t^*}{Z_t^* z}\right) y_{V,t}(z) - f_V Q_t \frac{w_t^*}{Z_t^*} - Q_t \phi_{V,t} \frac{w_t^*}{Z_t^*}(\psi_{V,t}^{-\xi} - 1) \quad (19)$$

- Export: $$\max_{\{\rho_{X,t}(z)\}} d_X(z) = \left(\rho_{X,t}(z) - \tau^* Q_t^{-1} \frac{w_t}{Z_t z}\right) Q_t y_{X,t}(z) - f_X \frac{w_t}{Z_t} \quad (20)$$

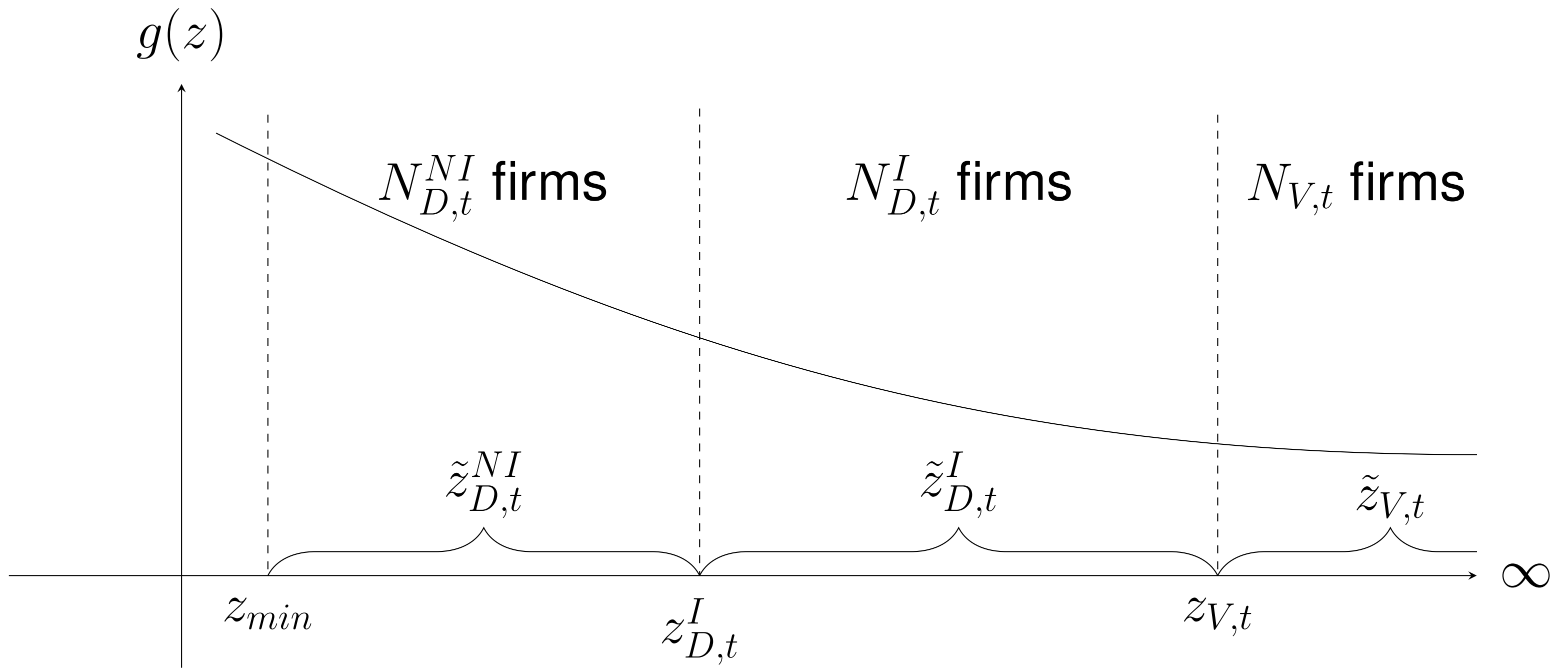
where $Q_t \equiv \epsilon_t P_t^* / P_t$ is a real exchange rate, and $\psi_{V,t} < \psi_{D,t}$.

Profit Maximization

- Prices:
  - Domestic:
    - With intangible investment: $\rho^{I}_{D,t}(z) = \frac{\theta}{\theta - 1}\psi^{\xi}_{D,t}\frac{w_t}{Z_t z}$ (21)
    - W/O intangible investment: $\rho^{NI}_{D,t}(z) = \frac{\theta}{\theta - 1}\frac{w_t}{Z_t z}$ (22)
  - Offshoring: $\rho_{V,t}(z) = \frac{\theta}{\theta - 1}\tau Q_t \psi^{\xi}_{V,t}\frac{w^*_t}{Z^*_t z}$ (23)
  - Export: $\rho_{X,t}(z) = \frac{\theta}{\theta - 1}\tau^* Q^{-1}_t \frac{w_t}{Z_t z}$ (24)

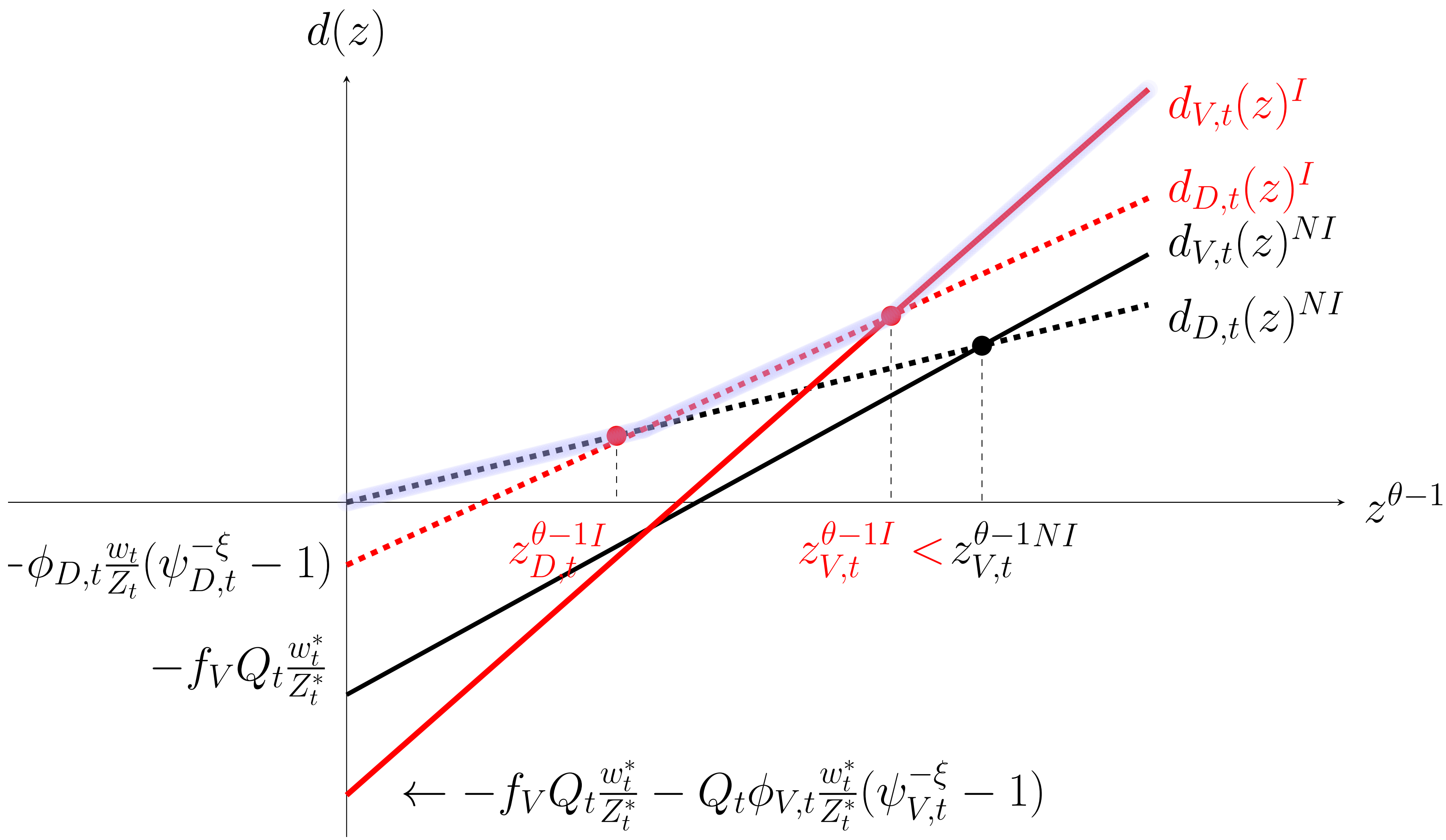
Productivity Cutoff

- Intangible investment cutoff: $z^I_{D,t} = \{z : d^I_{D,t}(z^I_{D,t}) = d^{NI}_{D,t}(z^I_{D,t})\}$ (25)
- Offshoring cutoff: $z_{V,t} = \{z : d^I_{D,t}(z_{V,t}) = d_{V,t}(z_{V,t})\}$ (26)
- Export cutoff: $z_{X,t} = inf\{z : d_{X,t}(z) > 0\}$ (27)



Graph: Productivity Cutoff

- Implication: Intangibles **lower** the offshoring cutoff.



Entry

- Unbounded mass of prospective entrants.
- Entry occurs if expected value exceeds sunk entry cost.
- Free entry condition:

$$\tilde{v}_t(z) = E_t \sum_{s=t+1}^{\infty} [\beta(1-\delta)]^{s-t} \left(\frac{C_s}{C_t}\right)^{-\gamma} \tilde{d}_s(z) = \frac{w_t}{Z_t} f_{E,t} \qquad (28)$$

Household Budget Constraint and Intertemporal Choices

- Household holds two types of assets: domestic risk-free bond holdings B_t & mutual fund share holdings x_t.
- The period budget constraint:

$$B_{t+1}+\tilde{v}_t(N_t+N_{E,t})x_{t+1}+C_t = (1+r_t)B_t+(\tilde{v}_t+\tilde{d}_t)N_t x_t+w_t L \quad (29)$$

- The Euler equations:

(Bond) $$(C_t)^{-\gamma} = \beta(1+r_{t+1})E_t[(C_{t+1})^{-\gamma}] \quad (30)$$

(Share) $$\tilde{v}_t = \beta(1-\delta)E_t\left[\left(\frac{C_{t+1}}{C_t}\right)^{-\gamma}(\tilde{v}_{t+1}+\tilde{d}_{t+1})\right] \quad (31)$$

Aggregate Profits and Aggregate Accounting

- Total profits:

$$N_t\tilde{d}_t(z) = N_{D,t}^{NI}\tilde{d}_{D,t}^{NI}(z) \ + N_{D,t}^{I}\tilde{d}_{D,t}^{I}(z) + N_{V,t}\tilde{d}_{V,t}(z) + N_{X,t}\tilde{d}_{X,t}(z)$$
$$N_t^*\tilde{d}_t^*(z^*) = N_{D,t}^{*NI}\tilde{d}_{D,t}^{*NI}(z^*) + N_{D,t}^{*I}\tilde{d}_{D,t}^{*I}(z^*) + N_{X,t}^*\tilde{d}_{X,t}^*(z^*) \tag{32}$$

- Aggregate income & expenditure (Inelastic labor supply):

$$Y_t = w_t + N_t\tilde{d}_t(z), \ \ Y_t = C_t + N_{E,t}\tilde{v}_t(z) \tag{33}$$

- The consumption price indexes:

$$1 = N_{D,t}^{NI}(\tilde{\rho}_{D,t}^{NI}(z))^{1-\theta} \ + N_{D,t}^{I}(\tilde{\rho}_{D,t}^{I}(z))^{1-\theta} + N_{V,t}(\tilde{\rho}_{V,t}(z))^{1-\theta} + N_{X,t}^*(\tilde{\rho}_{X,t}^*(z^*))^{1-\theta}$$
$$1 = N_{D,t}^{*NI}(\tilde{\rho}_{D,t}^{*NI}(z^*))^{1-\theta} + N_{D,t}^{*I}(\tilde{\rho}_{D,t}^{*I}(z^*))^{1-\theta} + N_{X,t}(\tilde{\rho}_{X,t}(z))^{1-\theta} \tag{34}$$

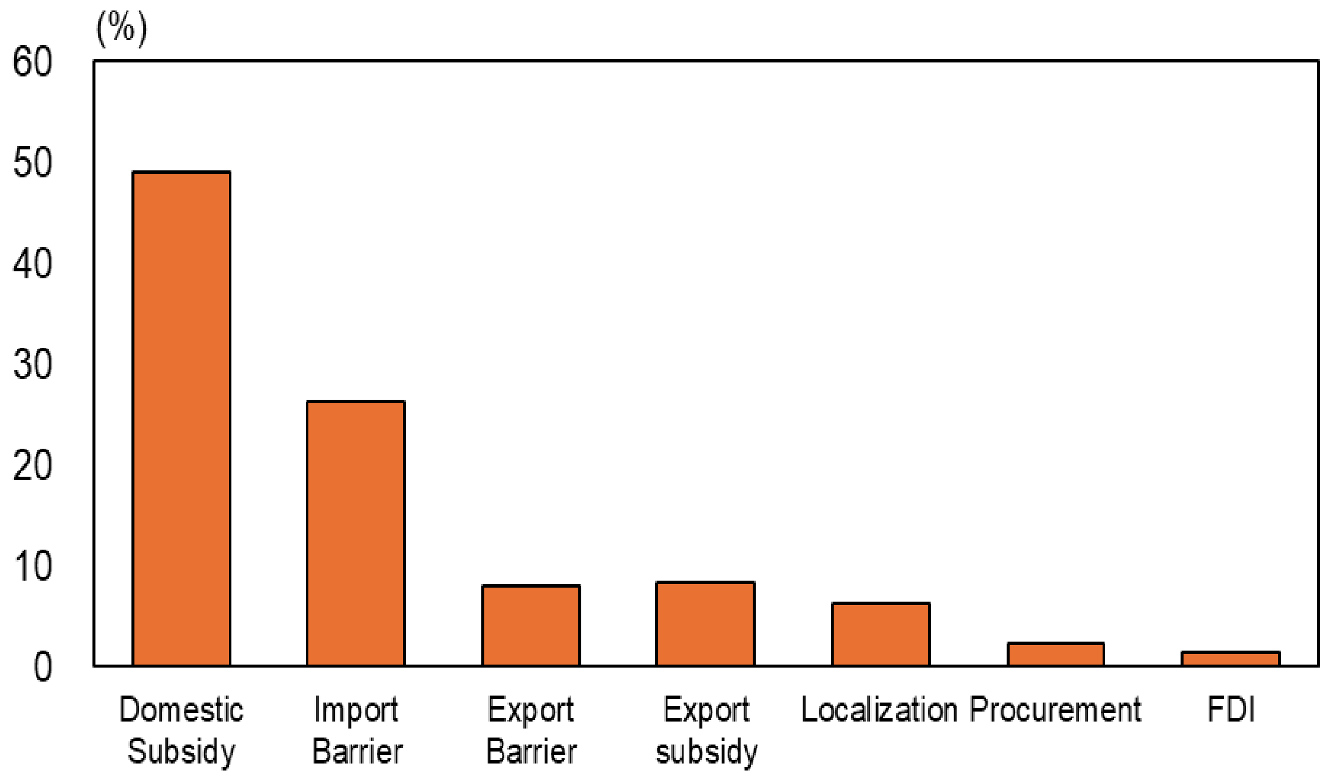
- Current account in Home:

$$CA_t = N_{X,t}(\tilde{\rho}_{X,t}(z))^{1-\theta}C_t^*Q_t + N_{V,t}\tilde{d}_{V,t}(z) - N_{V,t}(\tilde{\rho}_{V,t}(z))^{1-\theta}C_t^*Q_t - N_{X,t}^*(\tilde{\rho}_{X,t}^*(z^*))^{1-\theta}C_t \tag{35}$$

Reshoring Policies

- **Three** reshoring policies (Evenett, Jakubik, Martín, and Ruta, 2024):

  (1) Lump-sum subsidies, (2) Tax credits, (3) Tariffs

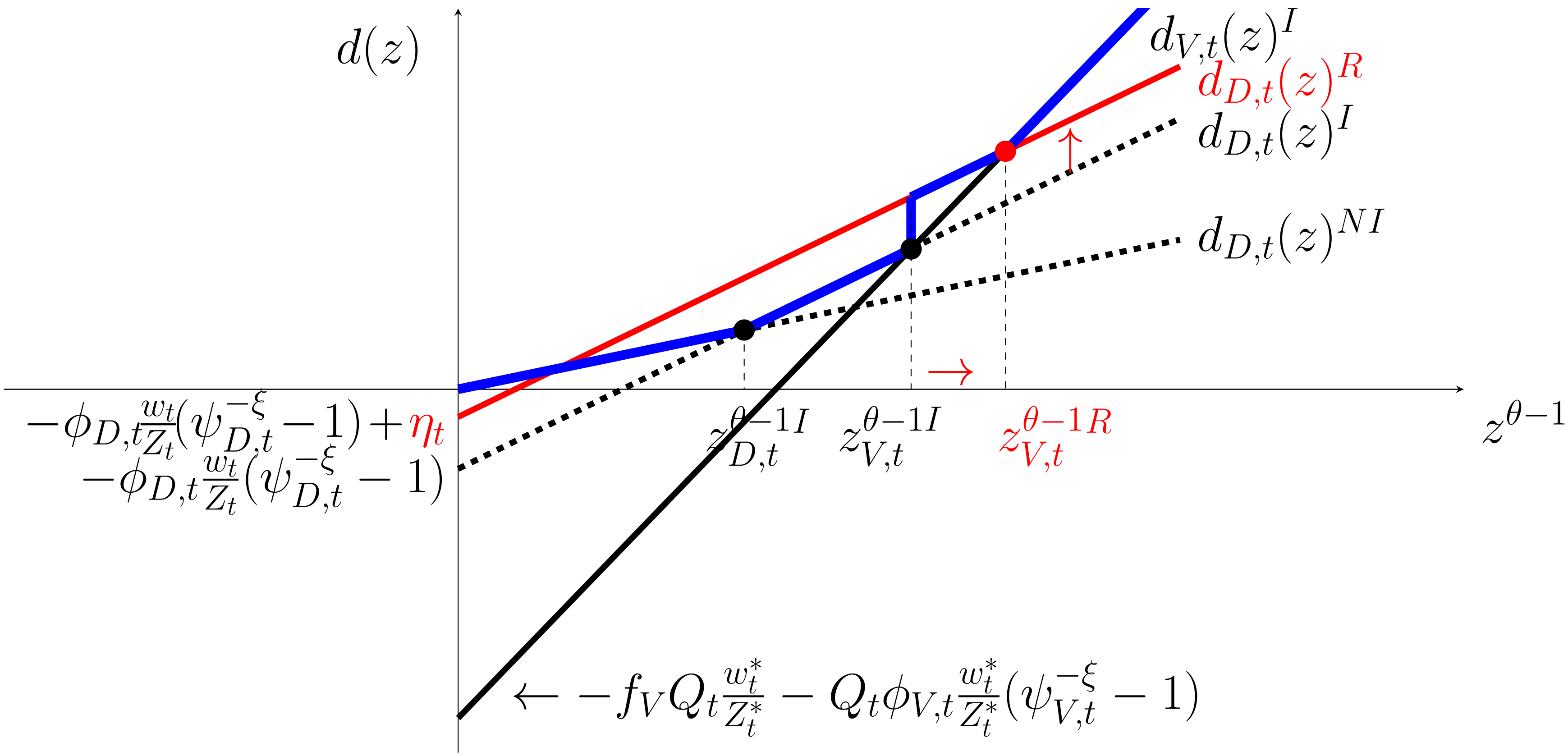


Data: Evenett, Jakubik, Martín, and Ruta (2024), New Industrial Policy Observatory (NIPO)
Note: Recalculated by the author, restricted to North America, Europe, Asia-Pacific, and South Asia.

1. Lump-Sum Intangible Investment Subsidies

(1) Lump-sum intangible investment subsidies ($\eta > 0$)

$$d^R_{D,t}(z) = \frac{1}{\theta}\Big(\rho^R_{D,t}(z)\Big)^{1-\theta} C_t - \phi_{D,t}\frac{w_t}{Z_t}(\psi^{-\xi}_{D,t} - 1) + \eta_t \quad \text{where } z \in [z^I_{V,t}, z^R_{V,t}] \tag{36}$$



2. Tax Credits

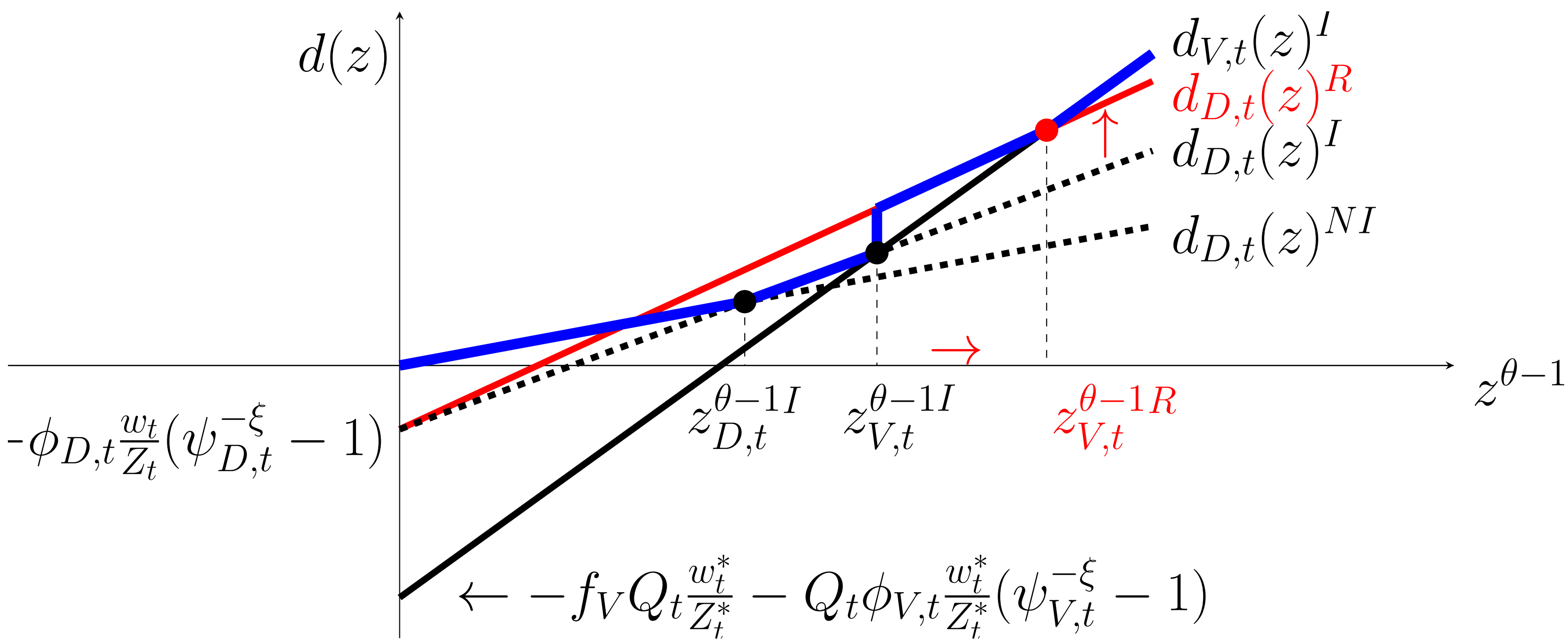
(2) Tax credits for domestic intangible firms ($t_s > 0$):

$$\max_{\{\rho_{D,t}\}} d^R_{D,t}(z) = \Big(\rho_{D,t} - \frac{1}{1+t_{s,t}}\psi^{\xi}_{D,t}\frac{w_t}{Z_t z}\Big)\rho^{-\theta}_{D,t}C_t - \phi_{D,t}\frac{w_t}{Z_t}(\psi^{-\xi}_{D,t} - 1) \tag{37}$$

Profit maximization: $\rho^R_{D,t} = \dfrac{1}{1+t_{s,t}}\dfrac{\theta}{\theta-1}\psi^{\xi}_{D}\dfrac{w_t}{Z_t z}$ where $z \in [z^I_{V,t}, z^R_{V,t}]$

Rewrite profit function:

$$d^R_{D,t}(z) = \frac{1}{\theta}(1+t_{s,t})^{\theta-1}\Big(\frac{\theta}{\theta-1}\psi^{\xi}_{D}\frac{w_t}{Z_t z}\Big)^{1-\theta}C_t - \phi_{D,t}\frac{w_t}{Z_t}(\psi^{-\xi}_{D,t} - 1)$$

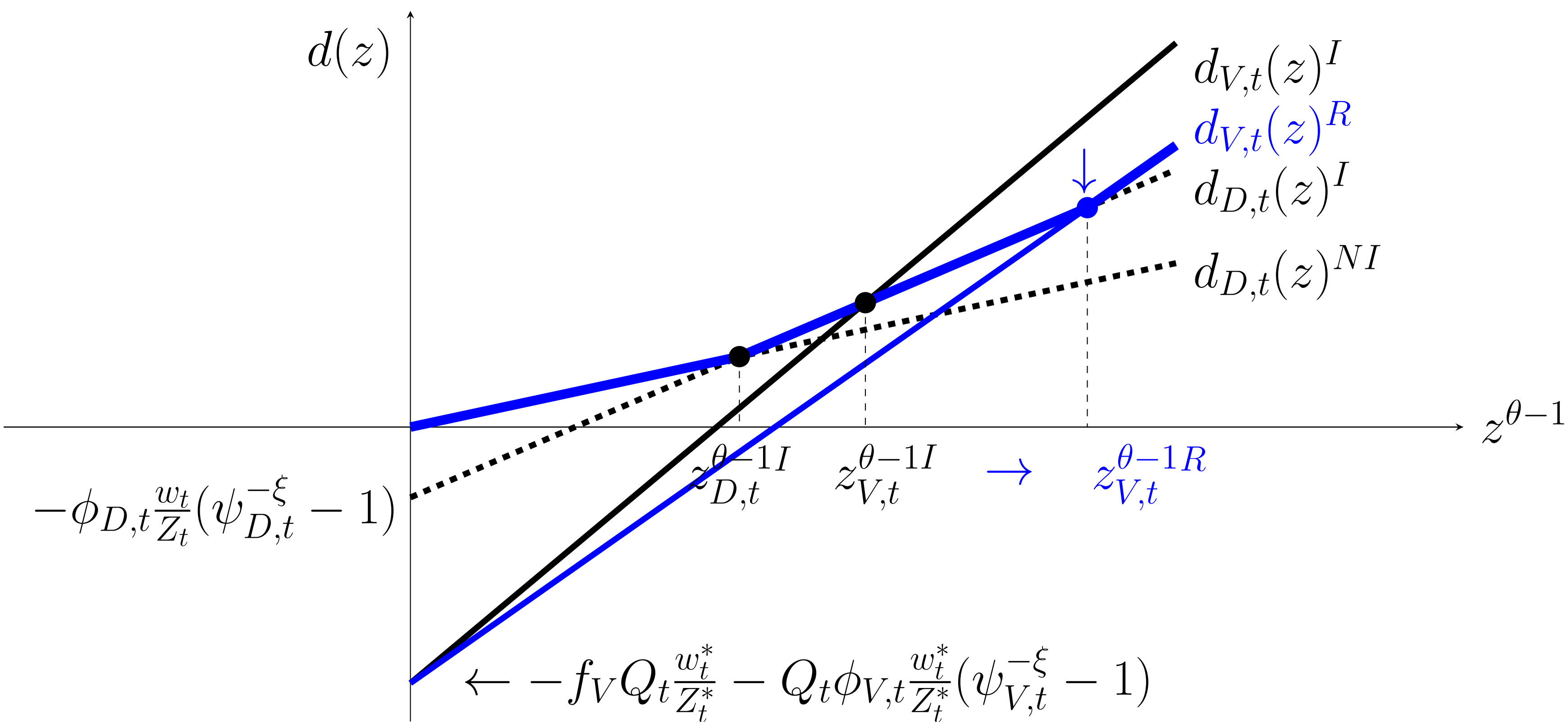


3. Tariffs

(3) The increase in import prices through tariff hikes ($\tau^R > 0$):

Rise in offshoring varieties price: $\rho^R_{V,t} = (1 + \tau^R_t)\dfrac{\theta}{\theta - 1}\tau Q_t \psi^{\xi}_{V,t}\dfrac{w^*_t}{Z^*_t z}$ (38)

Rise in imported varieties price: $\rho^{*R}_{X,t} = (1 + \tau^R_t)\dfrac{\theta}{\theta - 1}\tau Q_t \dfrac{w^*_t}{Z^*_t z^*}$ (39)



Government

- Subsidy and tariff revenues are rebated to households in a lump-sum.
- Household Budget Constraint:

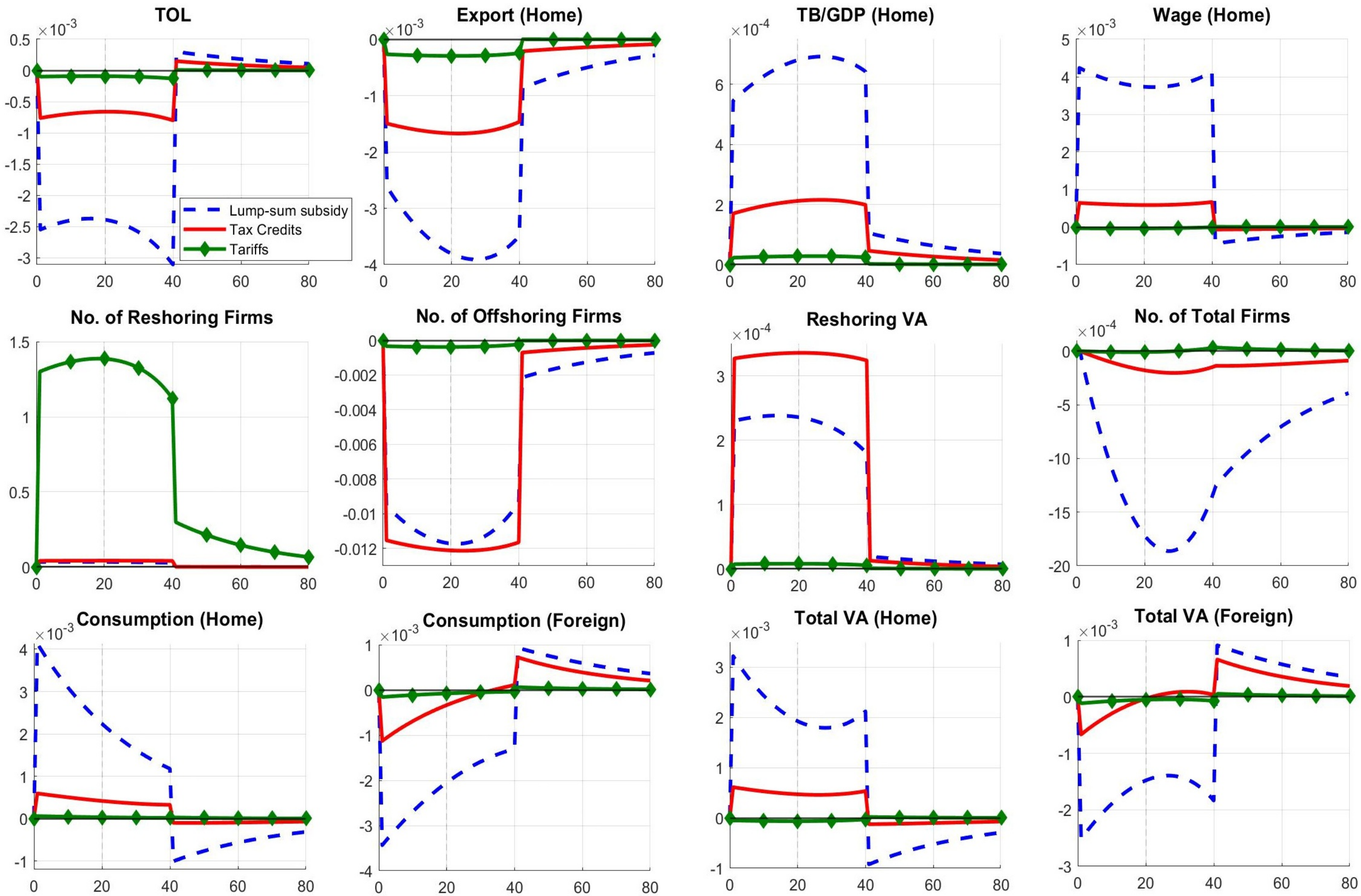
$$(1+r_t)B_t+(\tilde{v}_t+\tilde{d}_t)N_t x_t+w_t L+T_t \geq B_{t+1}+\tilde{v}_t(N_t+N_{E,t})x_{t+1}+C_t$$

- Govt Budget Constraint Equilibrium Conditions:
  - Intangible Subsidies: $T_t = -\eta_t N^R_{D,t}$
  - Tax Credits: $T_t = -\frac{t_{s,t}}{1+t_{s,t}} N^R_{D,t}\tilde{\rho}^R_{D,t}\tilde{y}^R_{D,t}$
  - Tariffs: $T_t = \tau^R_t N_{V,t}\tilde{\rho}^R_{V,t}\tilde{y}_{V,t} + \tau^R_t N^*_{X,t}\tilde{\rho}^{*R}_{X,t}\tilde{y}^*_{X,t}$

Parameters

Parameter	Description	Value	Source
β	Discount rate	0.99	Ghironi & Melitz (2005)
γ	The coefficient of relative risk aversion	2	Ghironi & Melitz (2005)
θ	The elasticity of substitution across products	3.8	Ghironi & Melitz (2005)
δ	The probability of firm exit	0.025	Ghironi & Melitz (2005)
k	The Pareto distribution parameter	3.8	
τ	The iceberg trade cost	1.2	Zlate (2016)
f_E	The sunk entry cost, Home	1	Zlate (2016)
f_E^*	The sunk entry cost, Foreign	4	Zlate (2016)
f_V	The fixed costs of offshoring	0.095	Zlate (2016)
f_X	The exporting fixed cost, Home	0.040	Zlate (2016)
f_X^*	The exporting fixed cost, Foreign	0.025	Zlate (2016)
ξ, ξ^*	Intangibles cost elasticity	2	De Ridder (2024)
ϕ	Share of intangible costs in fixed costs, Home	0.215	De Ridder (2024)
ϕ^*	Share of intangible costs in fixed costs, Foreign	0.279	De Ridder (2024)
ψ_D	The reduction fraction of marginal costs, Home	0.964	Compustat Segment [10]
ψ_V	The reduction fraction of marginal costs for offshoring, Home	0.930	Compustat Segment
ψ_D^*	The reduction fraction of marginal costs, Foreign	0.964	Compustat Segment

Comparison of Reshoring Policies



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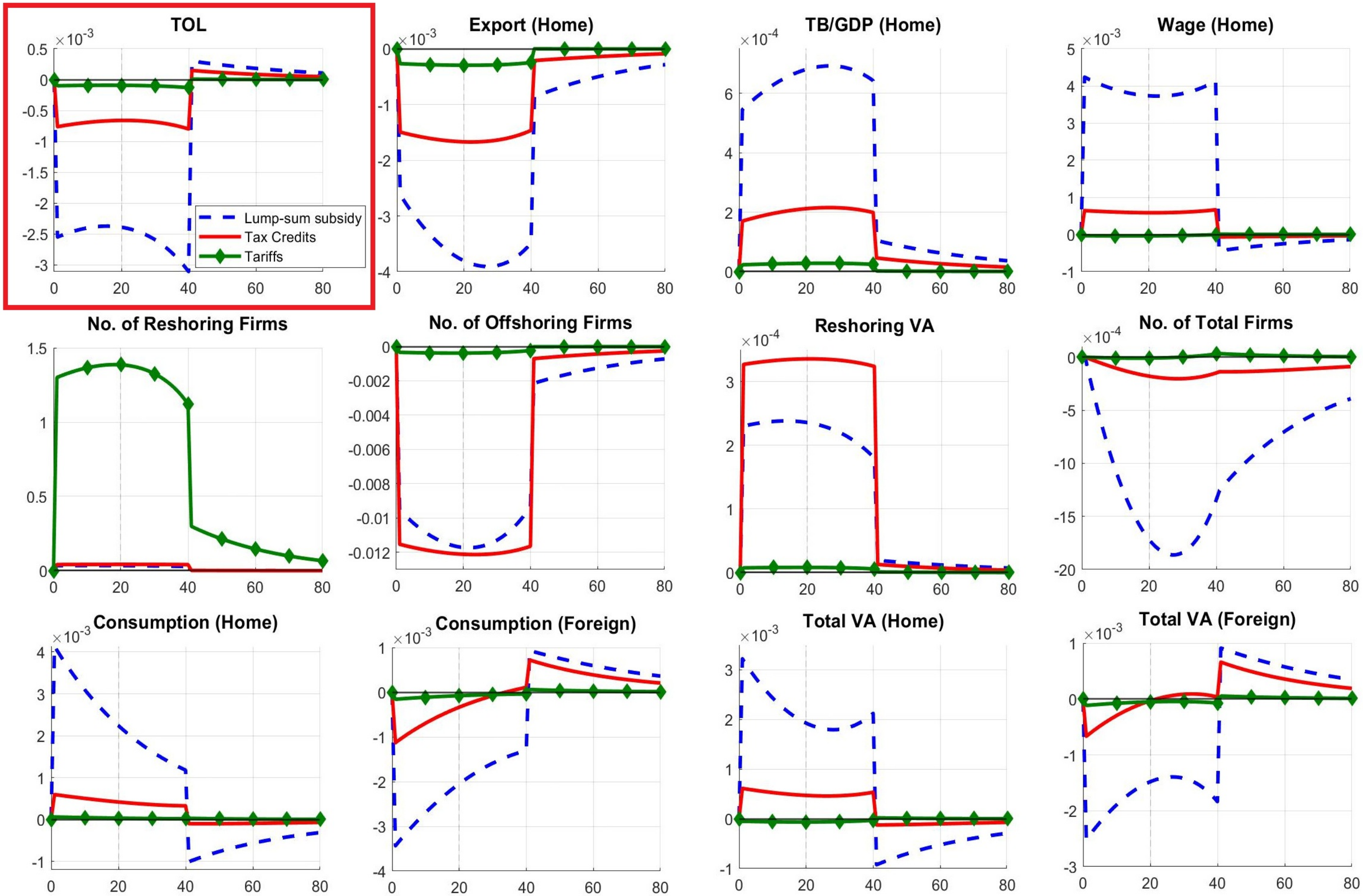

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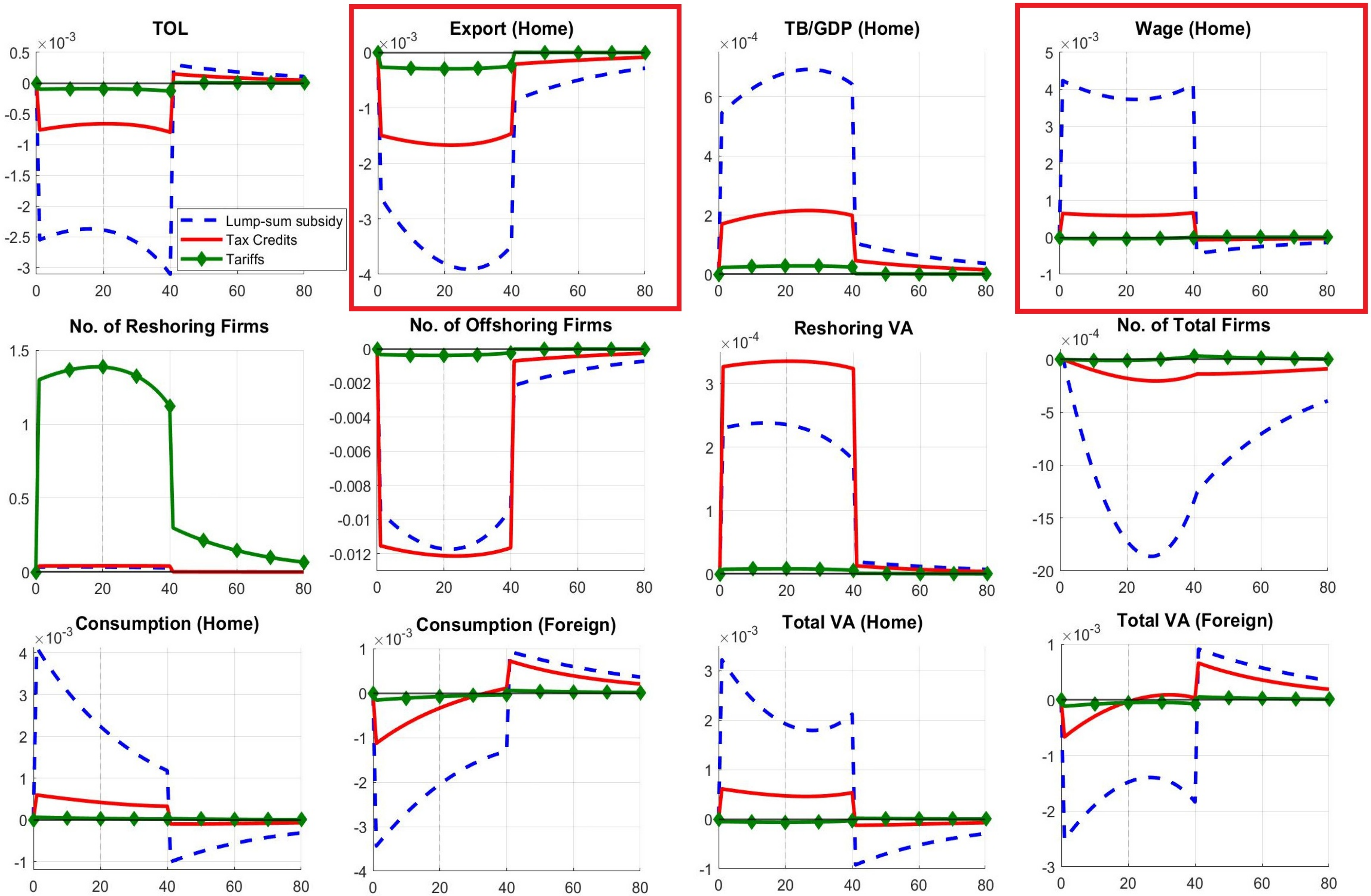

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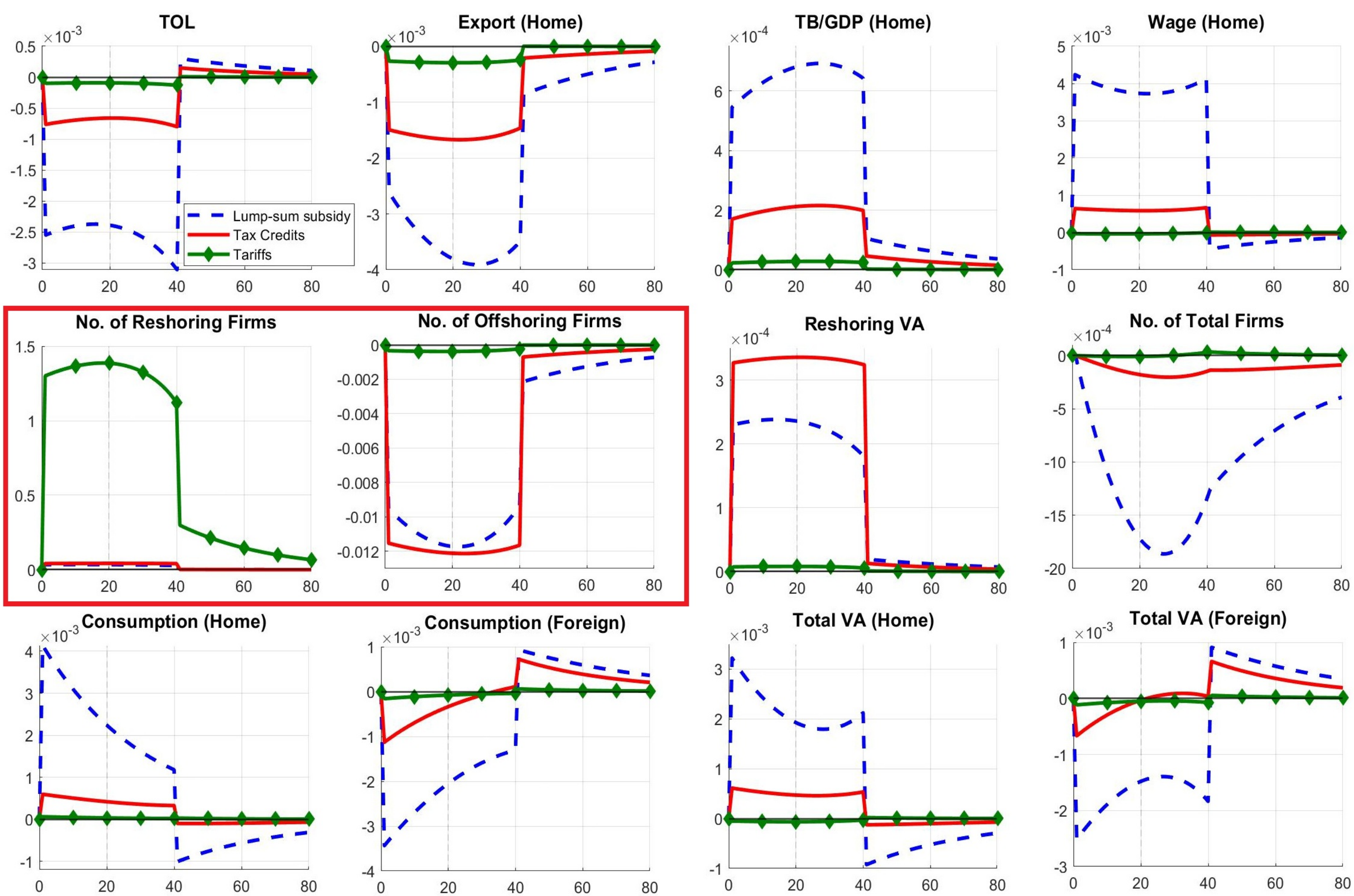
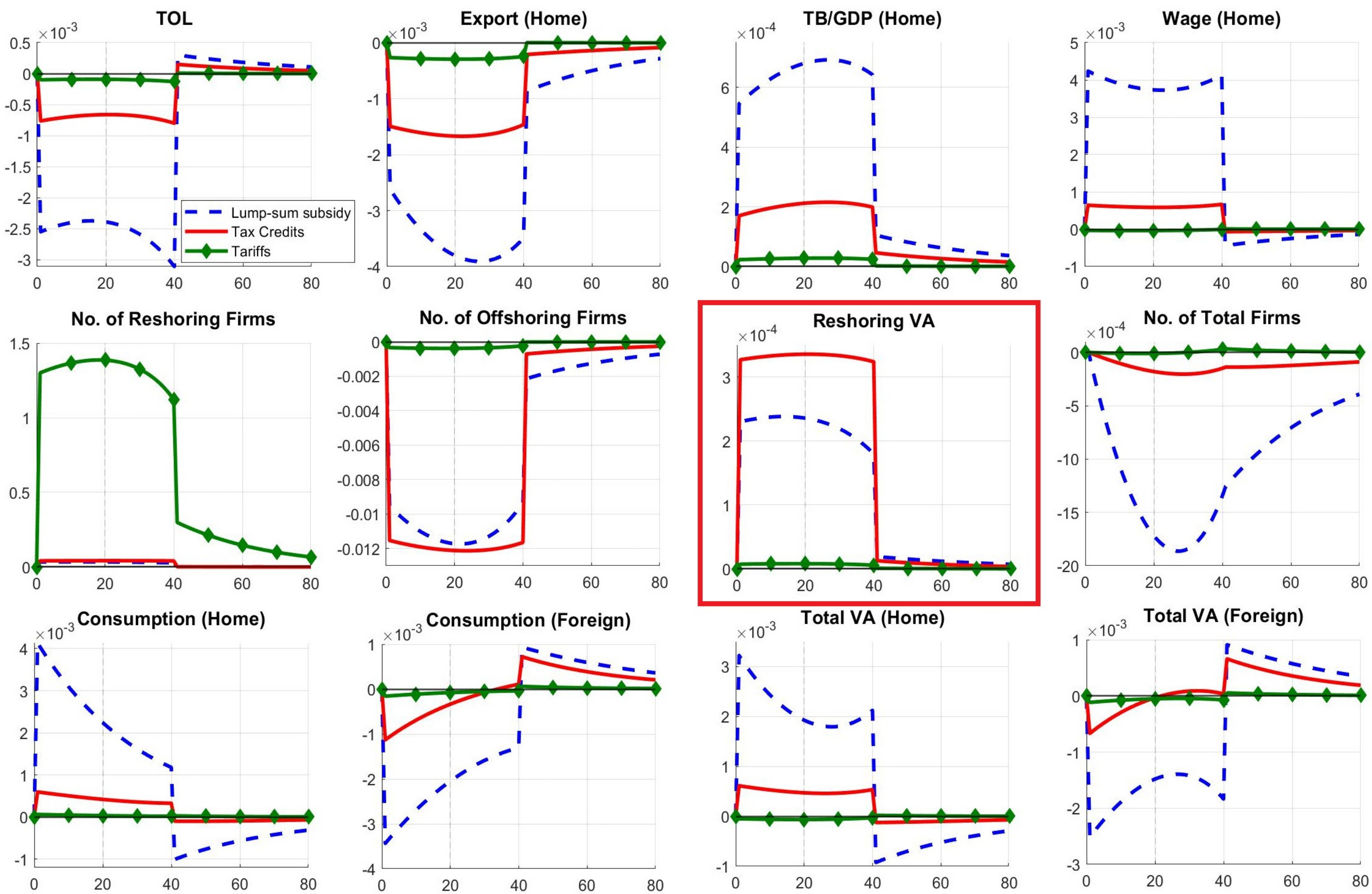
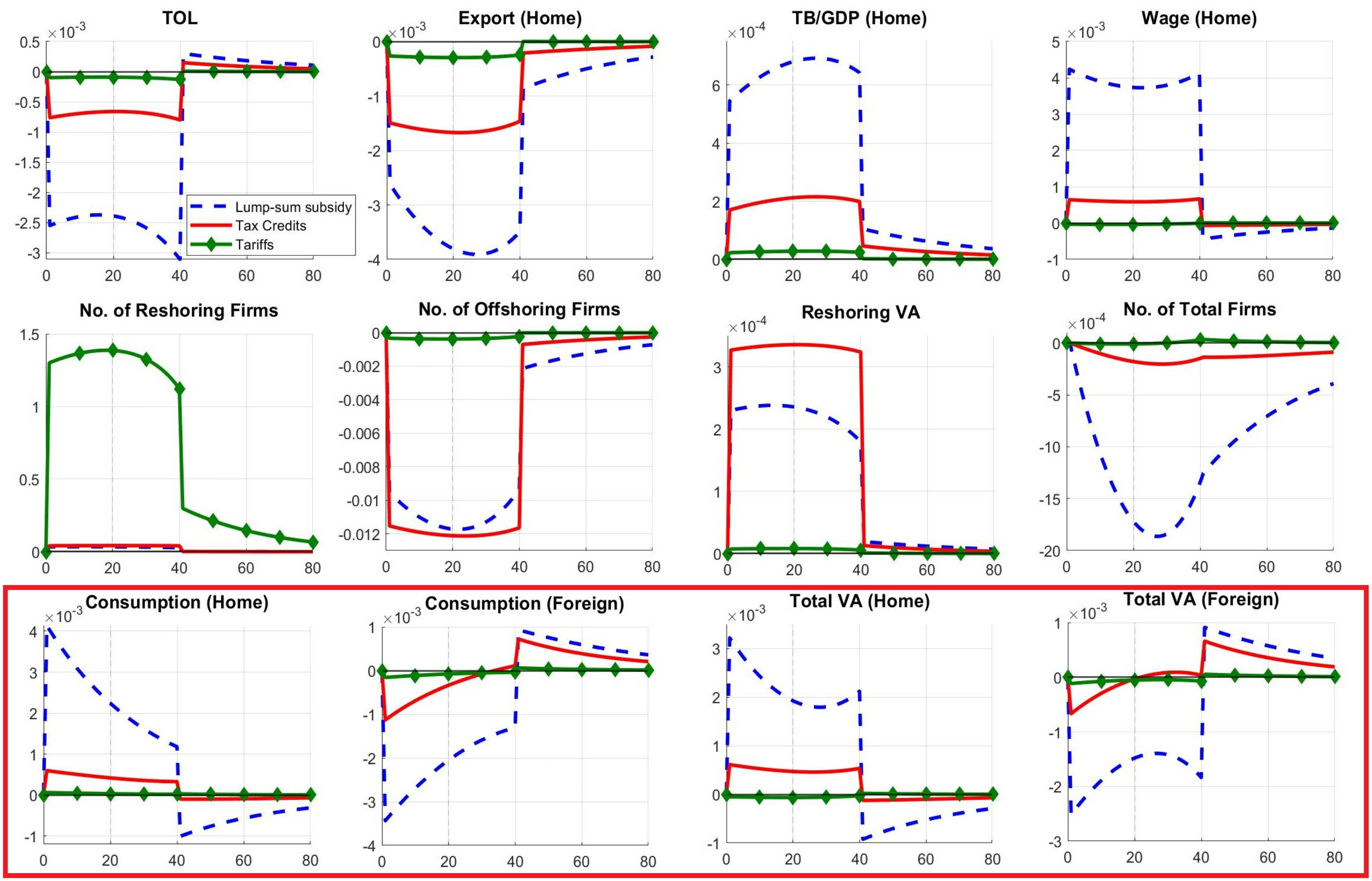


Comparison of Reshoring Policies [1] [4]



Comparison of Reshoring Policies [2] [3]



Welfare Analysis

- The lifetime utility measuring benchmark welfare w/o policies:

$$\mathcal{U}_0 \equiv \frac{1}{1-\beta}\left(\frac{C_0^{1-\gamma}}{1-\gamma}\right) \tag{40}$$

- The lifetime utility at the new stedy state after policies:

$$\mathcal{U}_{201}^{RP} \equiv \frac{1}{1-\beta}\left(\frac{C_{201}^{1-\gamma}}{1-\gamma}\right) \tag{41}$$

- Welfare with policies and its transition paths:

$$\mathcal{U}_0^{RP} = \sum_{t=0}^{200} \beta^t \frac{C_t^{1-\gamma}}{1-\gamma} + \beta^{201}\mathcal{U}_{201}^{RP} \tag{42}$$

Welfare Gains

- Welfare gains in initial consumption-equivalent terms:

$$\mathcal{U}_0^{RP} = \frac{1}{1-\beta}\left\{\frac{[(1+\Delta)C_0]^{1-\gamma}}{1-\gamma}\right\} \tag{43}$$

where $\Delta = \left(\frac{\mathcal{U}_0^{RP}}{\mathcal{U}_0}\right)^{\frac{1}{1-\gamma}} - 1$

- Welfare gains from comparative statics between the initial and new steady-states:

$$\mathcal{U}_{201}^{RP} = \frac{1}{1-\beta}\left\{\frac{[(1+\Delta_{ss})C_{201}]^{1-\gamma}}{1-\gamma}\right\} \tag{44}$$

where $\Delta_{ss} = \left(\frac{\mathcal{U}_{201}^{RP}}{\mathcal{U}_0}\right)^{\frac{1}{1-\gamma}} - 1$

Welfare Analysis

- **Reshoring policies** induce **transitional welfare gains** through scalability.
  - Reshoring subsidies: Labor demand$\uparrow \rightarrow$ wages$\uparrow \rightarrow$ C$\uparrow$
    - Lump-sum subsidies maximize transitional gains.
  - Tariffs: Revenue rebates$\uparrow \rightarrow$ purchasing power$\uparrow \rightarrow$ C$\uparrow$

		$\triangle$	$\triangle_{ss}$
Lump-sum Subsidies	Home	0.064	-0.000
	Foreign	-0.055	0.001
Tax Credits	Home	0.012	-0.000
	Foreign	-0.002	0.001
Tariffs	Home	0.002	0.000
	Foreign	-0.002	0.000

Table 2: Welfare changes following reshoring policies (%, initial consumption)

Conclusion

- **Reshoring subsidies** drive **transitional expansion**.
  - Lump-sum subsidies provide the largest boost to consumption and output by reshoring less productive firms and driving up wages.
  - Tax credits maximize reshored VA by reshoring productive firms to realize intangible-driven economies of scale.
- **Tariffs** boost consumption through rebates but **suppress** Home exports and **output across all periods** by depressing offshore VA.
- Reshoring policies targeting intangible-intensive firms induce **transitional welfare gains** through scalability.

Appendix (Empirical Fact 1): Reshoring VA (High-Intan)

- Post-policy, **high-intangible reshoring firms** show significantly **higher VA** relative to the control group. ↰

$$\ln(VA_{ist}) = \sum_{k\in K, k\neq -1} \beta_k (D_{sk} \times HighIntan_i \times Reshore_i) + \sum_{\tau} \Gamma_\tau (Size_{i,0} \times \delta_\tau) + \alpha_i + \delta_t + \lambda_s + \epsilon_{ist}$$

$\ln(VA_{ist})$: log of VA (Sales-Cost of Goods Sold); D_{sk}: policy dummy (Lump-sum, Tax credits, Tariffs); $HighIntan_i$: High-intangible dummy (top 25%); $Reshore_i$: Binary indicator $(1/0)$; $\alpha_i, \delta_t, \lambda_s$: firm & year & industry FE

Data: New Industrial Policy Observatory (NIPO), Compustat Historical Segment
Note: Shaded areas represent 95% confidence intervals for the interaction term (Policy × High-Intan).

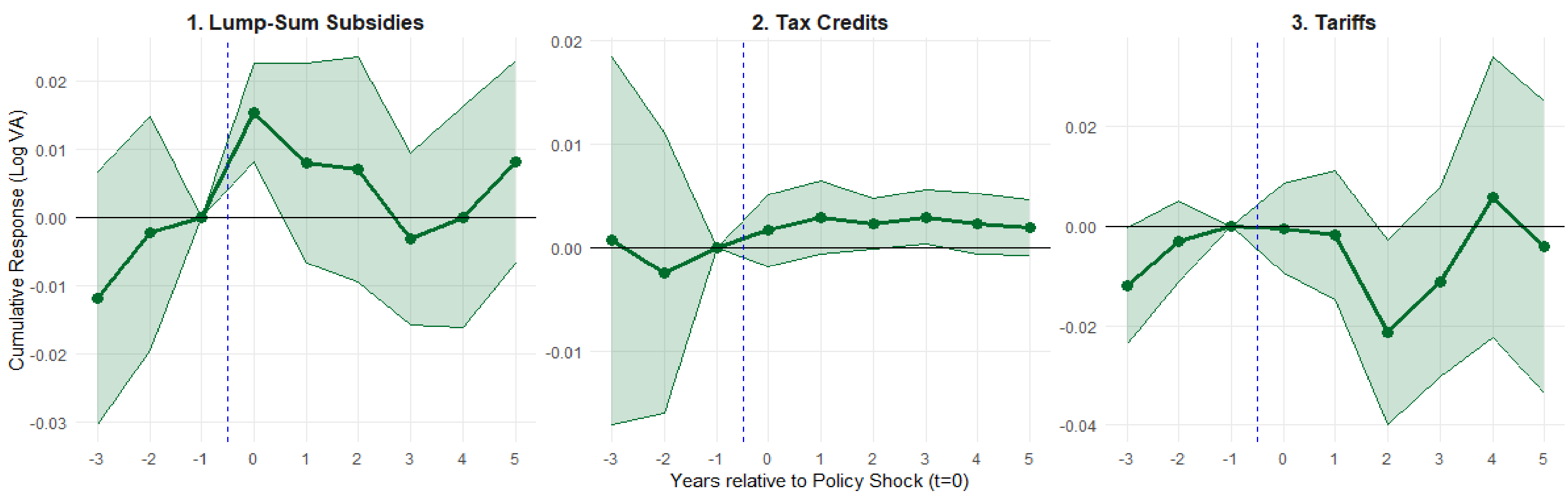
Appendix (Empirical Fact 2): Total VA (High-Intan)

- Industry-level local projections: ↰

$$\ln(VA_{j,t+h}) - \ln(VA_{j,t-1}) = \beta_{1,h} Policy_{jt} + \Gamma_h \mathbf{X}_{j,t-1} + \alpha_j + \delta_t + \epsilon_{j,t+h}$$

$\ln(VA_{j,t+h}) - \ln(VA_{j,t-1})$: Cumulative growth in real VA for industry j from $t-1$ to $t+h$. $Policy_{jt}$: Number of reshoring policy shocks in year t. $\mathbf{X}_{j,t-1}$: Control variables including log of employment ($\ln(Emp_{j,t-1})$) and log of capital stock ($\ln(Cap_{j,t-1})$). α_j, δ_t: Industry and year fixed effects. h: Forecast horizon ($h = 0, \ldots, 5$).

- **Reshoring subsidies boost** cumulative real **VA**, whereas **tariffs reduce** real **VA** within the **top 25%** of intangible-intensive U.S. manufacturing.



Data: NBER-CES Manufacturing Industry Database, New Industrial Policy Observatory (NIPO), Compustat Historical Segment
Note: Shaded areas represent 95% confidence intervals.

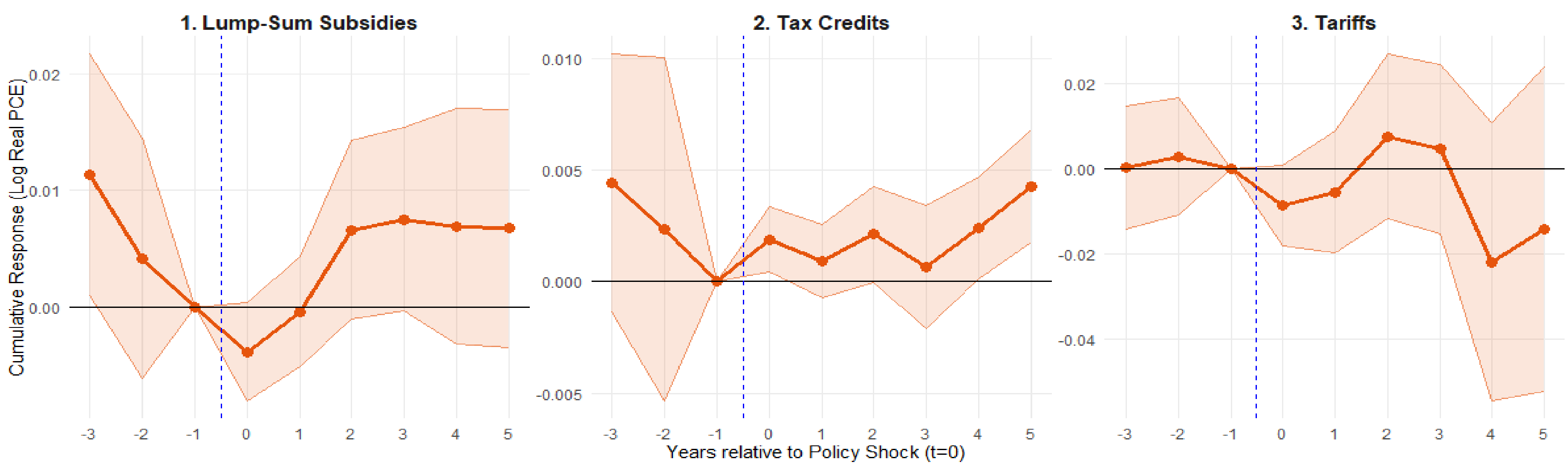
Appendix (Empirical Fact 3) : PCE (High-Intan)

- Industry-level local projections: ↰

$$\ln(PCE_{j,t+h}) - \ln(PCE_{j,t-1}) = \beta_h Policy_{jt} + \gamma_h \Delta \ln(PCE_{j,t-2}) + \Gamma_h \mathbf{X}_{j,t-1} + \alpha_j + \delta_t + \epsilon_{j,t+h}$$

$\ln(PCE_{j,t+h}) - \ln(PCE_{j,t-1})$: Cumulative growth in real Personal Consumption Expenditures from $t-1$ to $t+h$ in industry j. $Policy_{jt}$: Number of reshoring policy shocks in year t. $\Delta \ln(PCE_{j,t-2})$: Pre-intervention trend control ($\ln PCE_{j,t-2} - \ln PCE_{j,t-3}$). $\mathbf{X}_{j,t-1}$: Vector of lagged control variables including $\ln(TFP4_{j,t-1})$, $\ln(Emp_{j,t-1})$, $\ln(Cap_{j,t-1})$, and $\ln(Wage_{j,t-1})$. α_j, δ_t: Industry (NAICS 6-digit) and year fixed effects. h: Forecast horizon ($h = -3, \dots, 5$, where $h = -1$ is the baseline).

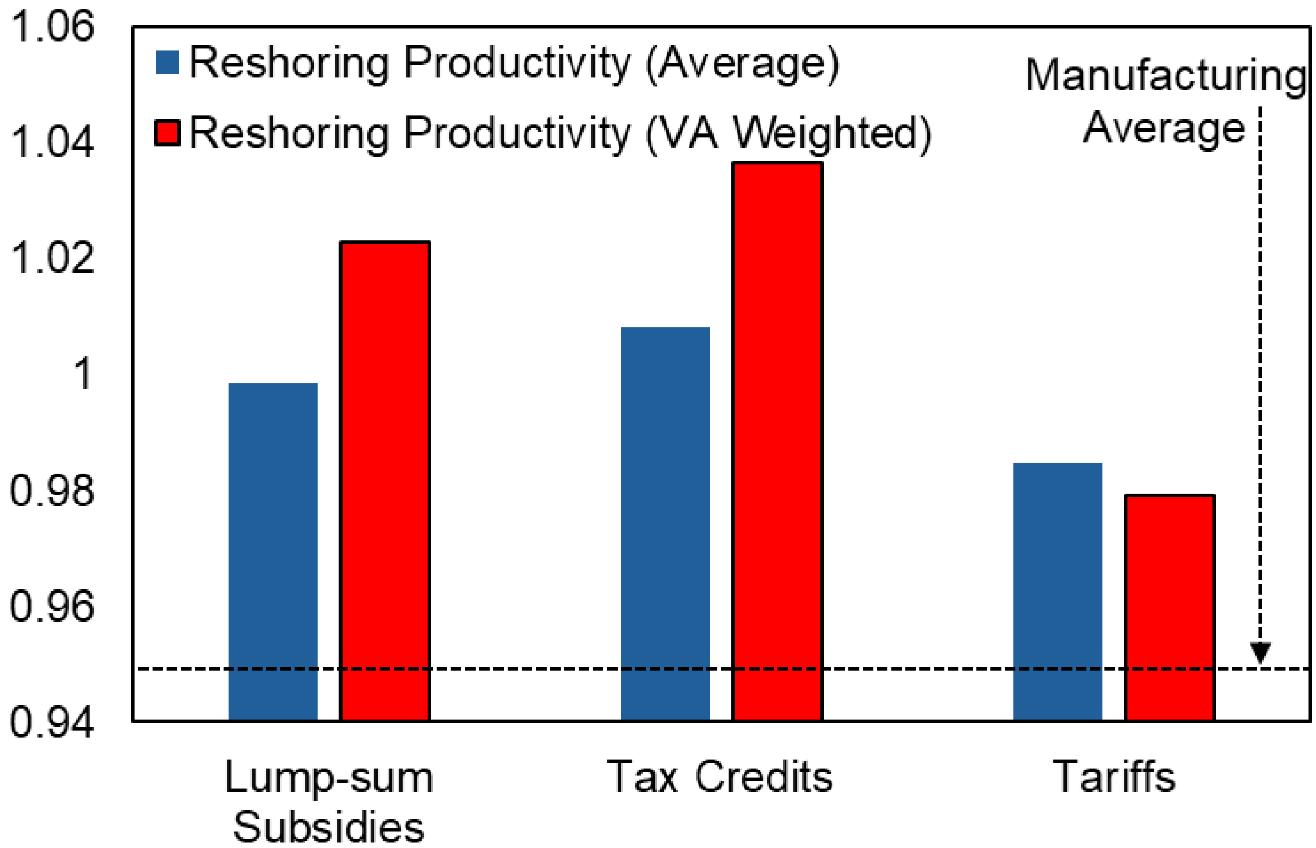
- **Reshoring subsidies** significantly **increased consumption** in industries targeted by reshoring policies, while tariffs had no statistically significant effect.



Data: NBER-CES Manufacturing Industry Database, New Industrial Policy Observatory, Compustat Historical Segment, BEA
Note: Shaded areas represent 95% confidence intervals.

Appendix (Empirical Fact 4): Average Reshoring Productivity

- Average reshoring productivity: Tax Credits $>$ Lump-sum Subsidies $>$ Tariffs



Data: NBER-CES Manufacturing Industry Database, New Industrial Policy Observatory (NIPO), Compustat Historical Segment
Note: Reshoring firms are identified by a domestic investment share exceeding its 3-year moving average by 1.2σ, alongside a decline in foreign investment. For firms with limited history, a ≥ 10 pp increase in domestic share is required.

Appendix 5 (Empirical Evidence): Scalability of Intangibles

- The ***Compustat Segment Historical Data*** covers over 23,000 North American companies (70% of the database) since 1976, providing business, geographic, product, and customer information.
- The introduction of intangibles provides scalability that lowers marginal costs.
- This characteristic significantly expands the profits of manufacturing firms that invest more in intangibles.

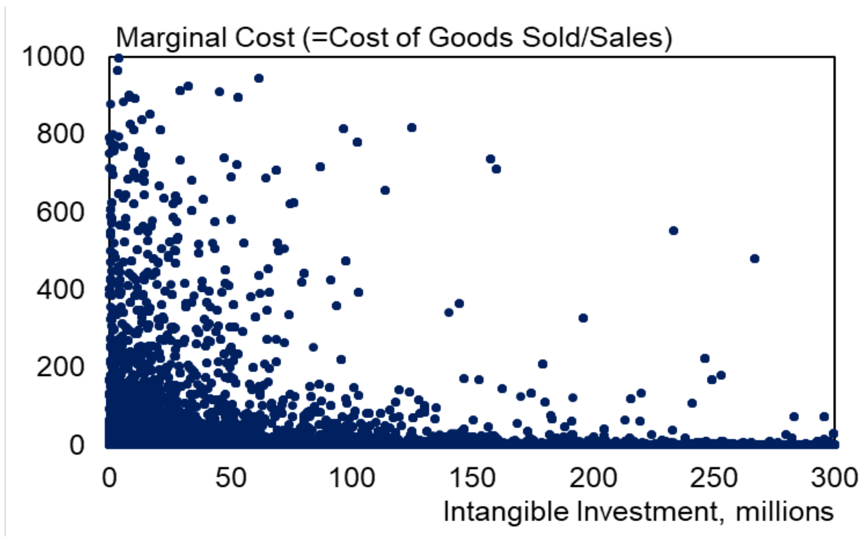


Figure 9: Scalability of Intangible Investment
Source: Compustat Segment
Note: Intangible investment includes R&D and organizational-capital investment that is 30% of selling, general, and administrative expenses (Corrado et al., 2009; Eisfeldt and Papanikolaou, 2013).

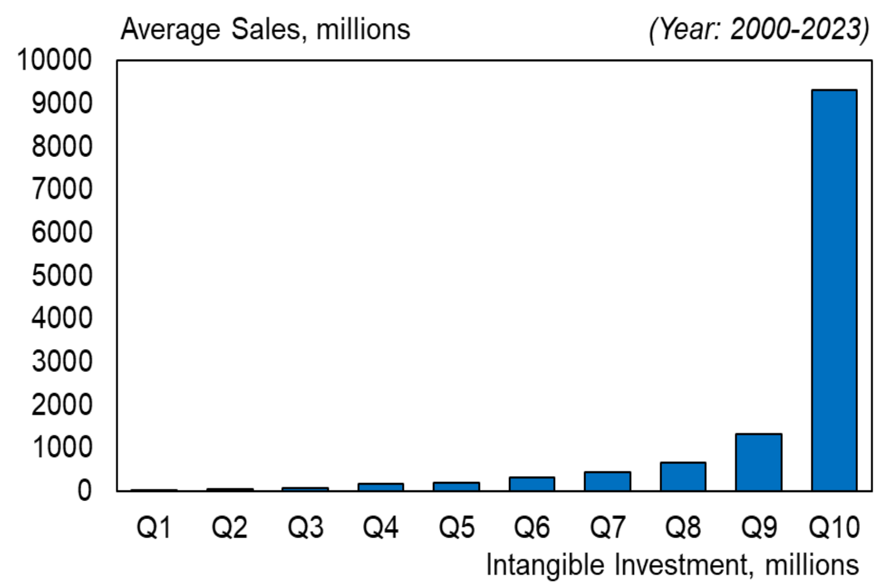


Figure 10: Quantiles of Intangible Investment and Average Sales (Manufacturing)
Source: Compustat Segment

Appendix 6: High Productivity Spurs Intangibles and Offshoring

- More productive firms make higher intangible investments and engage more in offshoring.
- Offshore firms tend to have higher intangible investment and higher sales compared to non-offshore firms.

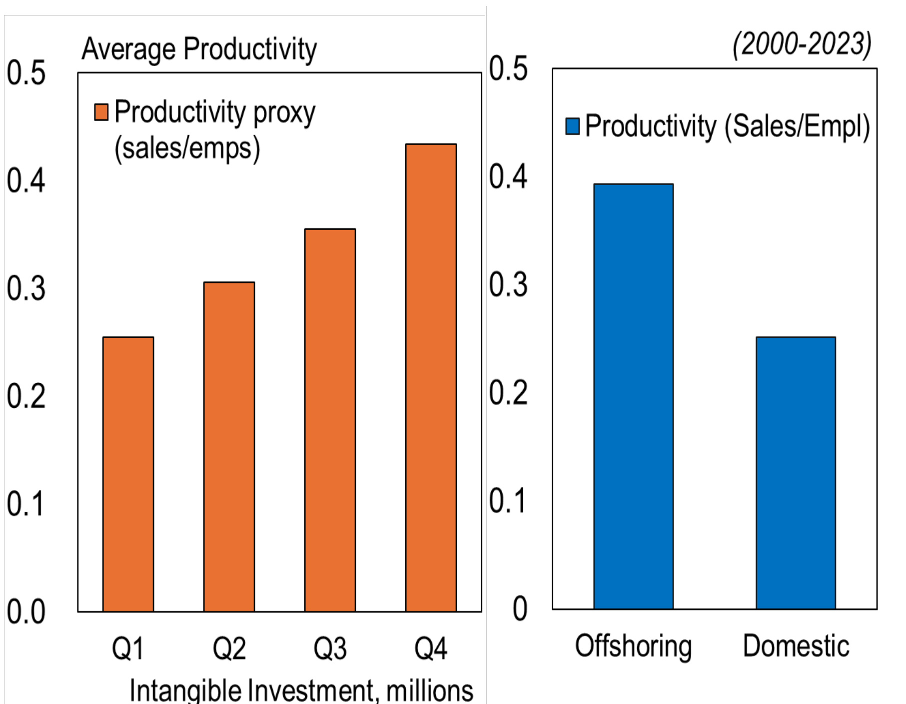


Figure 11: Intangibles Quantile & Productivity, Offshore vs. Domestic Productivity
Source: Compustat Segment

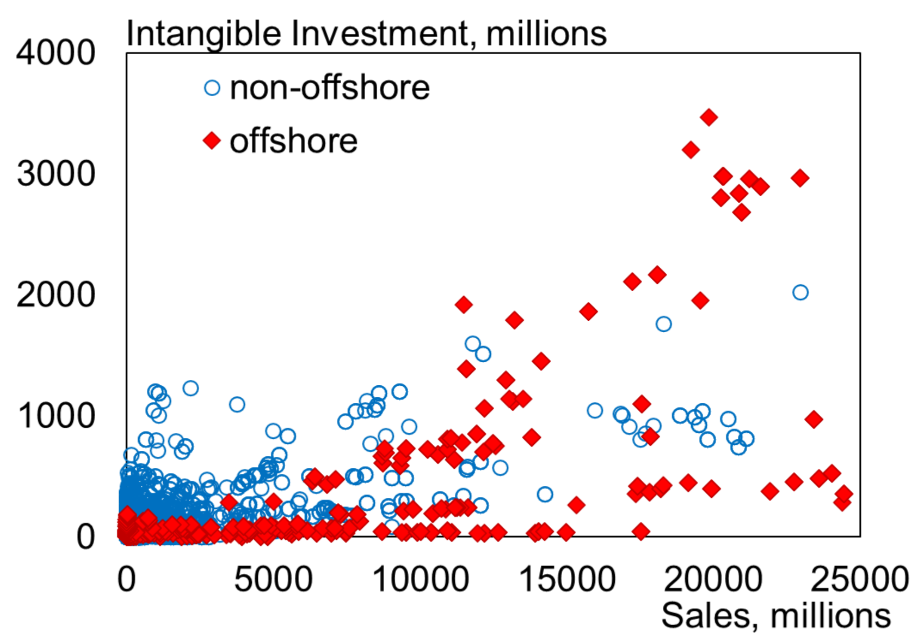


Figure 12: Offshore vs. Non-offshore Intangibles
Source: Compustat Segment
Note: Exclude data for non-offshore firms whose segments are classified as market, division, or product and service.

Appendix 7: Intangibles Boost Sales and Exports

- In manufacturing, intangible investments have a stronger positive correlation with net sales growth in high-tech industries and are also positively correlated with exports.
  - While Compustat Segment data represents only a small fraction of total export transactions, it shows a strong correlation of around 0.7 with actual export customs data. (Tito, Fed Notes, 2019)

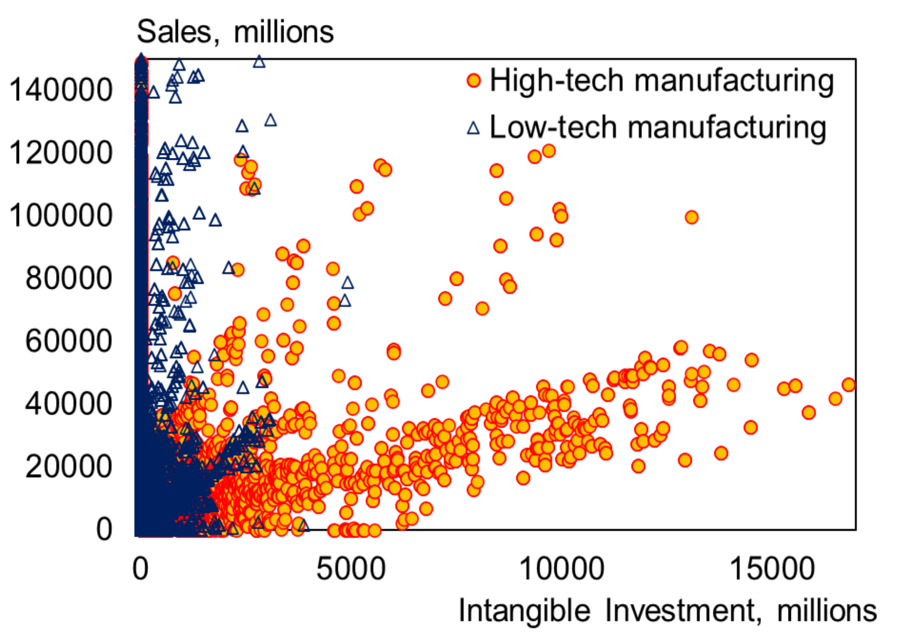


Figure 13: High- and Low-Tech Sales & Intangibles
Source: Compustat Segment

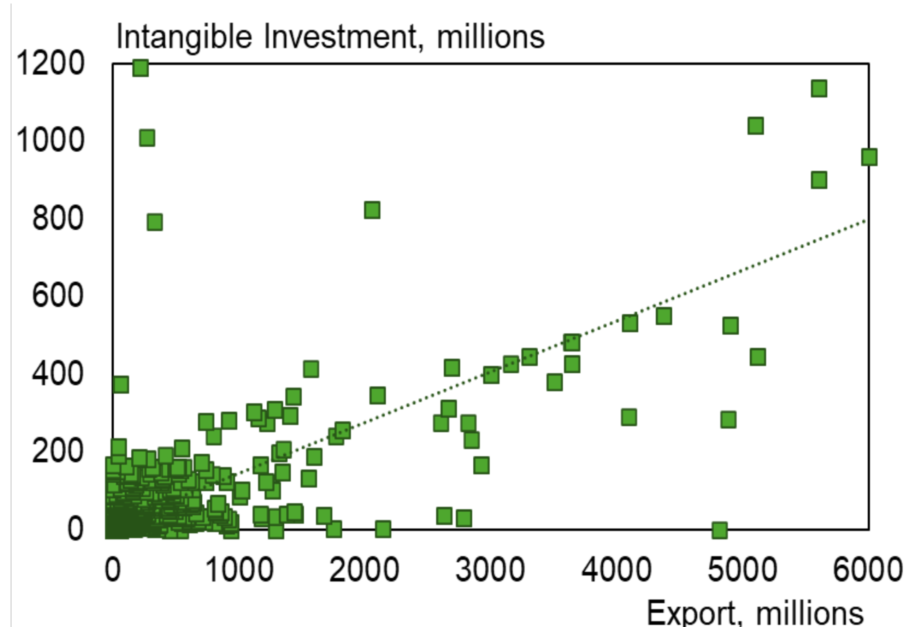


Figure 14: Export and Intangible Investment
Source: Compustat Segment

Appendix 8 (Empirical Evidence): Event Study

- Event Study: How a rise in intangible investment affects sales, exports, offshore value-added, and productivity over time

$$y_{i,t} = \sum_{j=-5}^{7} \gamma_j D_{i,t+j} + \delta_i + \delta_t + \beta X_{i,t} + \epsilon_{i,t}, \tag{45}$$

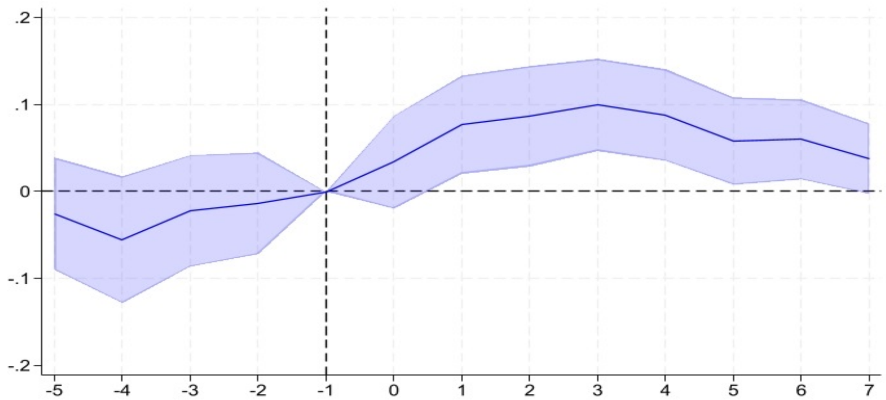
where

$$D_{i,t+j} = \begin{cases} 1 & \text{if firm } i\text{'s intan-to-sales ratio exceeds 10\% at relative year } \tau \\ 0 & \text{otherwise} \end{cases}$$

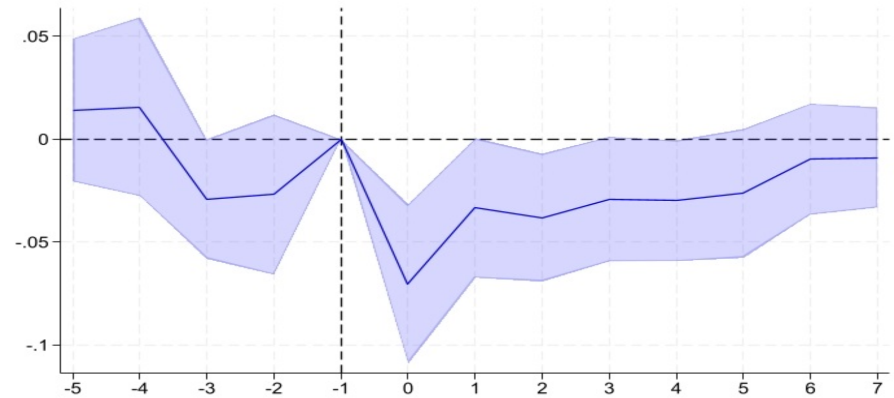
  - Relative year $j = 0$ corresponds to the event year when the intangible-to-sales ratio first exceeds 10%, and $j = -1$ is used as the omitted reference period.
  - $y_{i,t}$: sales, mc, export, offshore VA, productivity
  - γ_j : captures the effect at relative year j
  - δ_i and δ_t : firm and year fixed effects
  - $\beta X_{i,t}$: control variables

Appendix 8: Event Study (Manufacturing Firms)

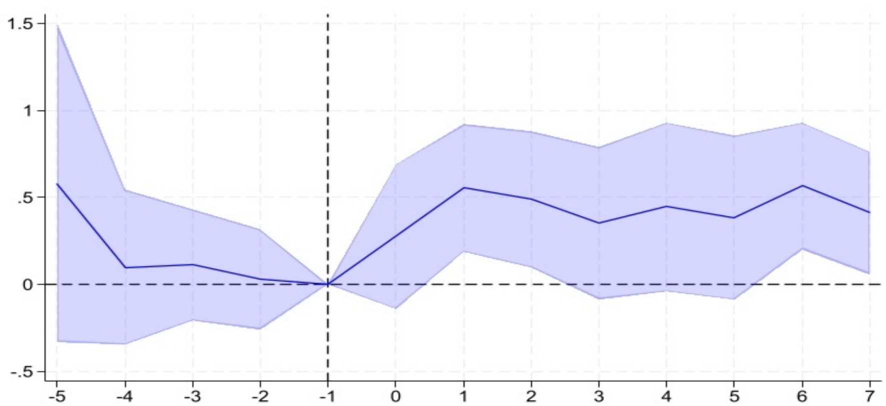
- Increased intangible investment among manufacturing firms boosts sales, exports, and productivity, while reducing marginal costs, indicating scalability relative to a control group with smaller intangible increases.



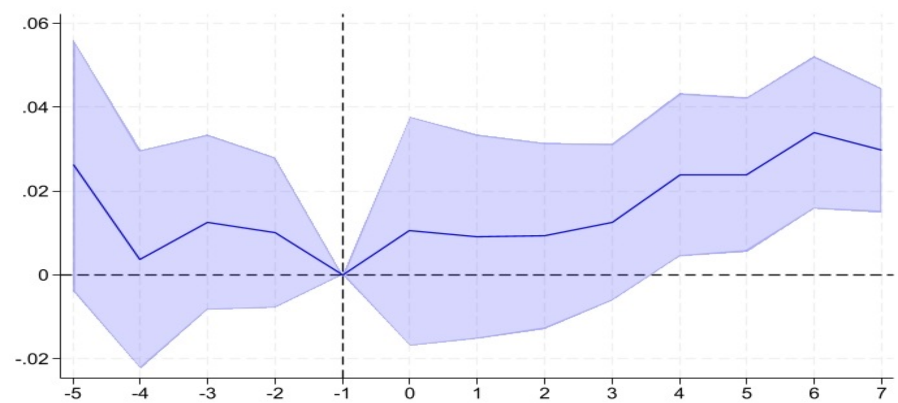
(a) Net Sales



(b) Marginal Costs (Cost of Goods Sold/Sales)



(c) Export[1]



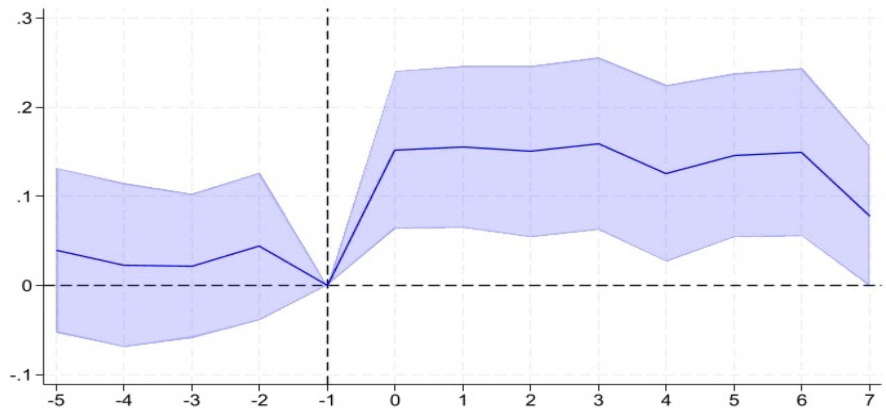
(d) Productivity

Source: Compustat Segment

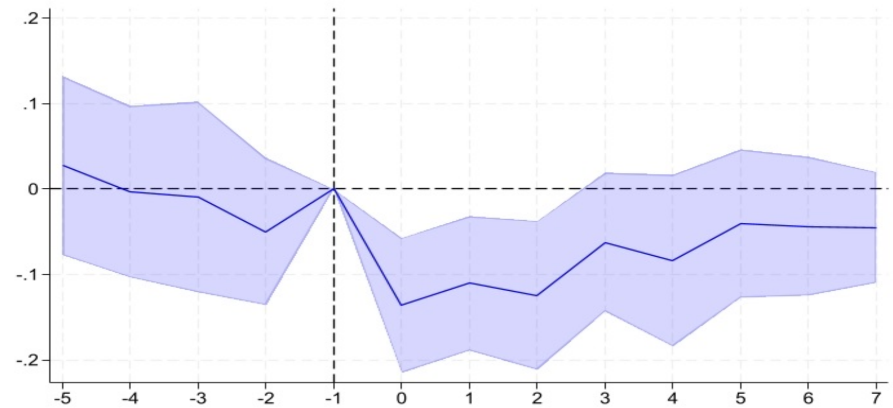
Note: Sample period is 2000–2023. For the dependent variables—export, marginal costs, and productivity measures—the inverse hyperbolic sine (IHS) transformation (asinh$(x) = \ln(x + \sqrt{x^2 + 1})$) was applied. (1) Missing values for exports are removed.

Appendix 9: Event Study (Offshore Firms)

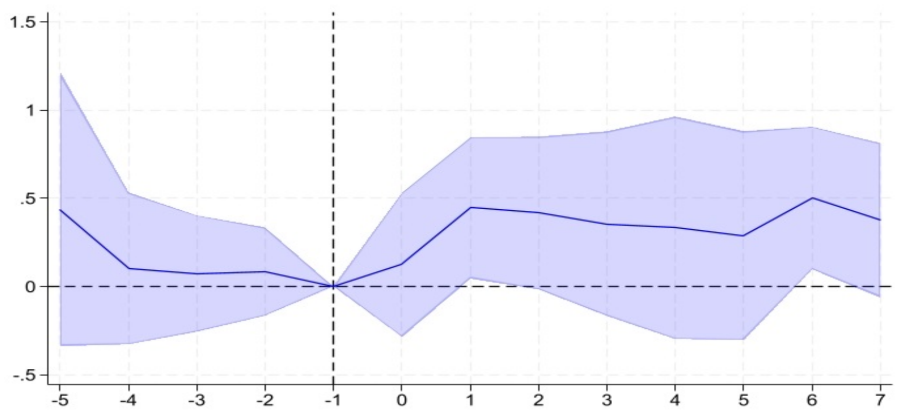
- Increased intangible investment among offshoring firms raises offshore VA, exports, and productivity, while lowering marginal costs, suggesting scalability relative to a control group with smaller intangible increases.



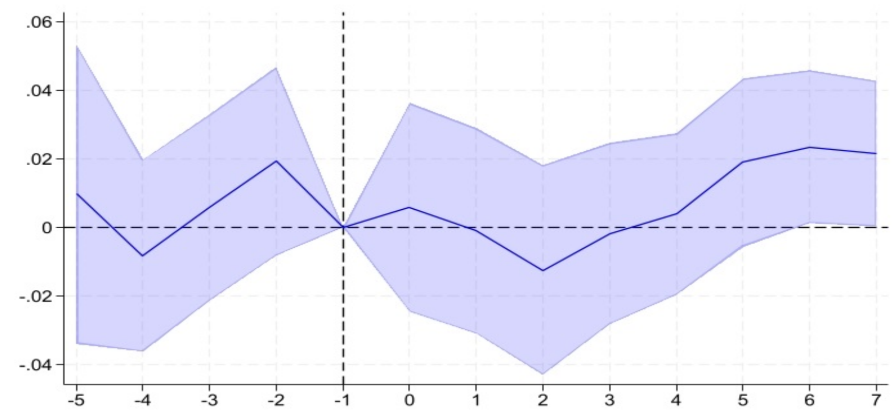
(a) Offshore VA[1]



(b) Offshore Marginal Costs (Cost of Goods Sold/Sales)



(c) Offshore Export[2]



(d) Offshore Productivity

Source: Compustat Segment
Note: Sample period is 2000–2023. For the dependent variables—export, offshore VA, and all productivity measures—the inverse hyperbolic sine (IHS) transformation was applied. (1) Offshoring VA is measured using sales of vertical offshore plants. (2) Missing values for exports are removed.

Appendix 10: Event Study Results

	Manufacturing Firms							
Dependent Variables	Log(Sales)	Log(Marg. Costs)	Log(Export)	Log(Productivity)	Log(Offsh. VA)	Log(Offsh. MC)	Log(Offsh. Export)	Log(Offsh. Prod.)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4 years before	-0.025	0.014	0.583	0.026	0.040	0.028	0.439	0.010
	(0.033)	(0.018)	(0.464)	(0.015)	(0.047)	(0.053)	(0.394)	(0.022)
3 years before	-0.055	0.016	0.099	0.004	0.023	-0.003	0.104	-0.008
	(0.037)	(0.022)	(0.227)	(0.013)	(0.047)	(0.051)	(0.218)	(0.014)
2 years before	-0.022	-0.029	0.112	0.013	0.022	-0.009	0.074	0.006
	(0.033)	(0.015)	(0.162)	(0.011)	(0.041)	(0.057)	(0.168)	(0.014)
1 year before	-0.014	-0.027	0.029	0.010	0.044	-0.050	0.086	0.019
	(0.030)	(0.020)	(0.146)	(0.009)	(0.042)	(0.044)	(0.127)	(0.014)
Event	0.034	-0.070***	0.276	0.010	0.152***	-0.136***	0.124	0.006
	(0.027)	(0.020)	(0.212)	(0.014)	(0.045)	(0.040)	(0.208)	(0.016)
1 year after	0.077***	-0.033*	0.556***	0.009	0.155***	-0.111***	0.447**	-0.001
	(0.029)	(0.017)	(0.187)	(0.012)	(0.046)	(0.040)	(0.203)	(0.015)
2 years after	0.087***	-0.038**	0.489**	0.009	0.150***	-0.125***	0.417*	-0.012
	(0.029)	(0.016)	(0.199)	(0.011)	(0.049)	(0.045)	(0.220)	(0.016)
3 years after	0.100***	-0.029*	0.353	0.013	0.159***	-0.062	0.356	-0.002
	(0.027)	(0.015)	(0.223)	(0.010)	(0.049)	(0.041)	(0.266)	(0.014)
4 years after	0.088***	-0.030**	0.446*	0.024**	0.126**	-0.084	0.334	0.004
	(0.027)	(0.015)	(0.247)	(0.010)	(0.051)	(0.051)	(0.320)	(0.012)
5 years after	0.058**	-0.026*	0.385	0.024**	0.146***	-0.041	0.291	0.019
	(0.026)	(0.016)	(0.239)	(0.009)	(0.047)	(0.044)	(0.301)	(0.013)
6 years after	0.060**	-0.010	0.566***	0.034***	0.150***	-0.044	0.503**	0.024**
	(0.023)	(0.014)	(0.186)	(0.009)	(0.048)	(0.041)	(0.206)	(0.011)
7 years after	0.038*	-0.009	0.411**	0.030***	0.078*	-0.045	0.376*	0.022**
	(0.021)	(0.012)	(0.179)	(0.008)	(0.040)	(0.033)	(0.222)	(0.011)
Pre-trend	No	Yes	Yes	Yes	No	No	Yes	No
Firm lin. time trends	Yes	No	No	Yes	No	No	No	Yes
FE (year)	No	No	Yes	No	Yes	Yes	Yes	No
FE (firm)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep. Var.	4.6886	0.8716	3.0913	0.3459	5.0892	0.9215	3.0651	0.3766
# Cluster (firm)	4,307	4,421	413	4,525	1,404	1,403	360	1,573
N	95,996	100,763	5,172	127,255	21,823	21,617	4,449	30,247
Prob $>$ F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R square	0.9696	0.8508	0.9457	0.6242	0.9599	0.7361	0.9499	0.8301

Notes: Robust standard errors in parentheses, clustered at the firm level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Dependent variables (export, offshore VA, productivity) are inverse hyperbolic sine transformed. Event study coefficients are relative to year -1 (normalized to 0). All regressions include firm fixed effects.