Who Reshores?

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Motivation

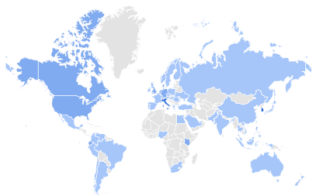
- 'Reshoring' started gaining significant traction since the 2010s.
  - Accompanied by the slowdown in global trade and GVC expansion.
- Policy discussions to promote reshoring have been active.
  - To secure domestic jobs and avoid supply chain disruptions
  - Countries like Korea and Japan have initiated specific pro-reshoring policies.
- Some *apparently* reshoring firms received substantial media attention.
  - Two Speedfactories of Adidas launched in Germany and the U.S. in 2016.
    - However, the company closed the factories three years later.
  - Its footwear production in Asia increased (96% in 2015 $\longrightarrow$ 98% in 2019).
    - Moved the speedfactory technology to Asian factories.

‘Reshoring’ in Google Trends

Interest over time

Interest by region

Region



1	South Korea	100
2	Italy	75
3	Singapore	75
4	Netherlands	50
5	Hong Kong	50

A Case in Korea: Aju Steel

- The 1st reshorer after President Moon pledged a bold reshoring strategy.
  - Mid-sized firm that produces materials for electronics and contruction.
    - 3 domestic establishments + 3 foreign affiliates before the reshoring
  - Among factories in China, Mexico, and Philippines, it reshored the last one.
    - Wanted to produce higher-quality products for which Korea is advantageous.
- What happened then?
  - 2020: Established a new domestic factory, with $16 million of subsidies.
    - Employed more than 100 workers + Adopted "Smart factory" technologies.
  - 2024: sold to a CVC investor at a low premium due to its high debt ratio (380%)
    - $10 million of negative operating profit before the deal
- The CEO said in an interview: ***"It's unrealistic to bring back companies that have already established stable operations overseas."***

Questions

- How can we identify reshoring?
  - Despite the keen interests, no systematic statistics have been presented.
  - In fact, it is not easy to identify which firms actually reshored.
    - ⋆ Need a comprehensive data on firm's global operation over years
  - Also note that reshoring firms yesterday can switch to offshore today.
    - ⋆ Need to observe the firms at least for a medium run.
- What drives firms to reshore (or offshore) their production?
  - Internal factors: firm's own characteristics
  - External factors: home vs. host country (and industry) characteristics
- What is the post-reshoring performance of these firms?
  - Descriptive statistics are provided for context, though not central.

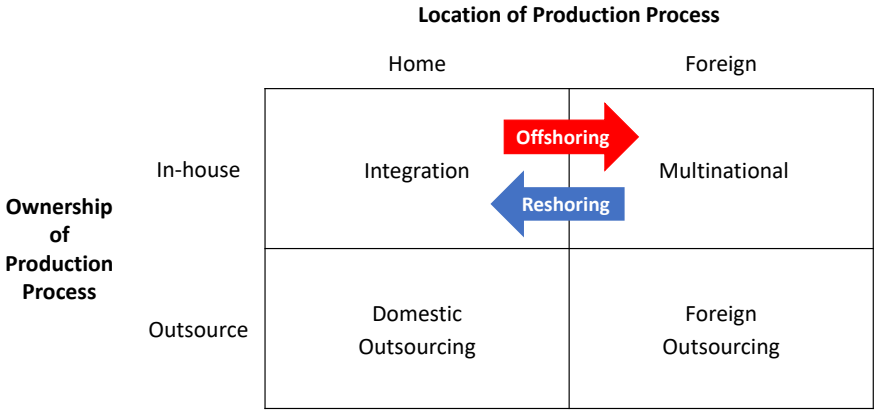
Previous Literature

- Reshoring has gained academic interest but remains understudied.
- A specific question: Does domestic automation influence reshoring?
  - Encourages reshoring by reducing domestic labor costs.
    - Faber (2020), Krenz et al. (2021)
  - Reinforces offshoring by improving global efficiency.
    - Artuc et al. (2023), Stapleton & Webb (2023)
- Other key factors:
  - Sunk costs make reshoring costly (Antras 2020).
  - Still, firms balance cost efficiency with supply chain risks; policy can incentivize reshoring (Grossman et al. 2023).
- Common assumption: Reshoring firms are productive enough to cover the costs.
- Our empirical findings challenge this view.

Perspectives on Reshoring in the Literature vs. Policy circle

- Feenstra (2010) defines offshoring in two ways.
  - Narrow: Firms invest in a foreign country to operate processes in-house (FDI).
  - Broad: FDI + foreign outsourcing
- Most studies measure reshoring by imported intermediate input share.
  - Close to the broad concept of offshoring with opposite direction.
- In policy, reshoring often refers to firms bringing operations back home.
  - Under Korea's U-turn Company support policy:
  - Firms must liquidate, transfer ownership, or reduce foreign operations by $\geq 25\%$.
  - They must also expand domestic operations in the same 3-digit industry.
- Our investment approach is close to the narrow concept.

Working Definition of Offshoring vs. Reshoring



Our Approach

- The questions are addressed by looking at multinational's investment decision.
  - Multinational (MNC): firms with 20% or more equity in foreign affiliates
  - Reshoring: MNC's domestic investment coupled with its foreign divestment (or at least no more foreign investment)
- Consistently, we classify MNCs' global investment into four MECE types.
  1. **Expander**: invests in both home and foreign countries.
  2. **Offshorer**: invests abroad, but not at home.
  3. **Reshorer**: invests at home, but not abroad.
  4. **Idler**: invests in neither (includes divestment).
- Consider an MNC chooses one of the four investment types.
  - balancing (i) the perceived productivity, (ii) history-dependent fixed costs, (iii) other internal and external economic conditions.

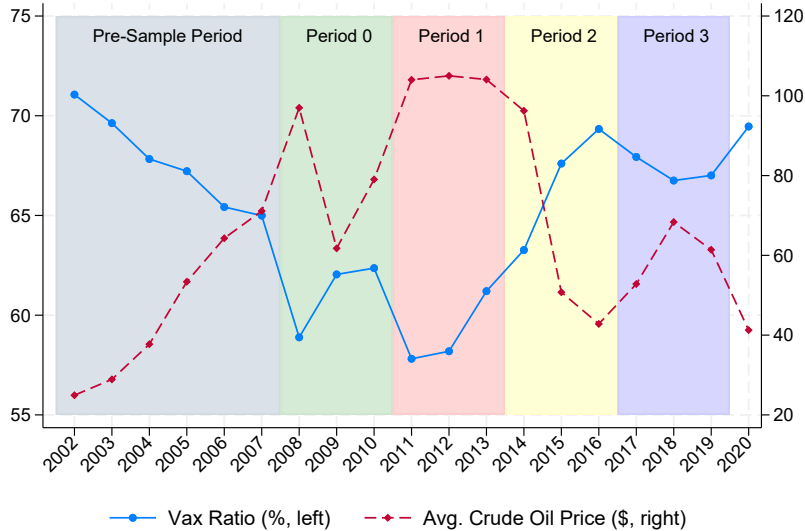
Data

- The case of Korea
  - Drastic FDIs until 2011, especially to China
  - One of few countries with legal policies for reshoring (since 2013).
- Survey of Business Activity (SBA) from Statistics Korea
  - All firms with 50 or more employees and 0.3 billion Won of paid-in capital.
  - Coverage of the data (12,900 firms as of 2019)
    - Value-added $\approx$ 30% of GDP, imports $\approx$ 72% of gross imports
  - Annual survey of firm-level activities
    - Investment, employment, exports/imports, financial sheets, ...
  - Particularly provides information about foreign affiliates.

Sample

- Sample period: 2008∼2019
- Divide years into four periods
  - Period 0=2008∼2010, 1=2011∼2013, 2=2014∼2016, 3=2017∼2019
  - Take average values over three years within a period.
- Sample is restricted to...
  - Manufacturing firms (according to primary industry classification)
  - Firms observable every year in the sample period
  - Firms with at least one foreign affiliate in 2010 (i.e., MNCs)
- The final sample includes a balanced panel of 1,200 MNCs.

VAX Ratio vs. Oil Price



Measure of Investment

- Own investment (I_O)
  - Growth rate of the stock of tangible asset (net of depreciation, real value)
  - Assume that a significantly positive investment is made if the growth rate>0
- Foreign Direct Investment (I_F)
  - Growth rate of the total investment stock on foreign affiliates
  - Change in the number of foreign affiliates (extensive margin)
- Investment in domestic firms (I_D)
  - Growth rate of the total investment stock on domestic affiliates
  - Change in the number of domestic affiliates (extensive margin)

Classification of Firms by Investment Type

- Benchmark
  1. Expander: $I_O > 0$ & $I_F > 0$
  2. Offshorer: $I_O \leq 0$ & $I_F > 0$
  3. Reshorer: $I_O > 0$ & $I_F \leq 0$
  4. Idler: $I_O \leq 0$ & $I_F \leq 0$
- Alternative ways of classification
  1. Use weighted average of I_O and I_D instead of I_O
  2. Use the change in the number of foreign affiliates instead of I_F
- All methods provide qualitatively the same results.

Stylized Fact 1 (Benchmark Case)

- Firms tend to invest or divest both home & foreign countries simultaneously.
  - Consistent with the literature (e.g., Desai et al. 2005, 2009)
  - Correlation coefficients are statistically significant, but not high in level.

Table: Spearman Rank Test

	I_O	I_F	I_D
I_O	1		
I_F	0.143***	1	
I_D	0.023	0.080***	1

Notes: *** denotes significance level at 1%.

Stylized Fact 1

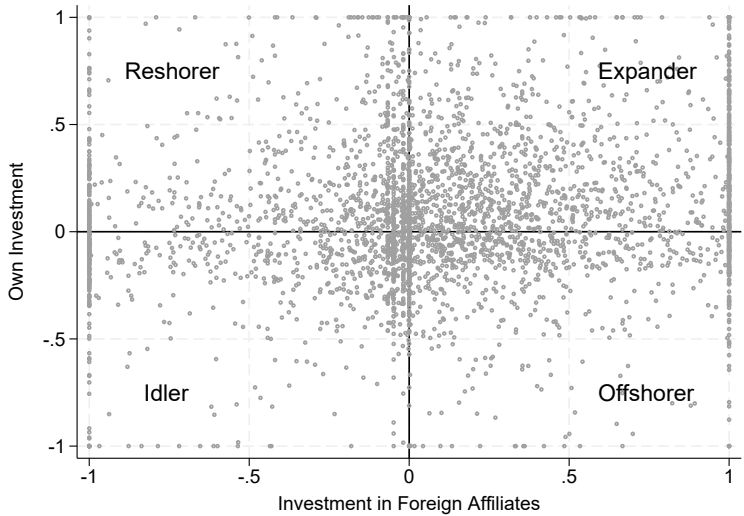
- Yet, there is a significant number of firms that defy the tendency.
  - Particularly a non-trivial share of reshorers among Korean manufacturers
  - 84% of the reshorers show negative growth of FDI stock ($I_F < 0$).

Table: Sample Firms by Investment Type

Period	Investment Type				Total
	Expander	Offshorer	Reshorer	Idler	
1	512	227	259	202	1,200
2	399	229	313	259	1,200
3	232	267	298	403	1,200
Total	1,143	723	870	864	3,600

Notes: Period 1=2011∼2013, Period 2=2014∼2016, Period 3=2017∼2019.

Entire Distribution of Investment Type



Notes: Values outside $[-1, 1]$ are censored.

Stylized Fact 2

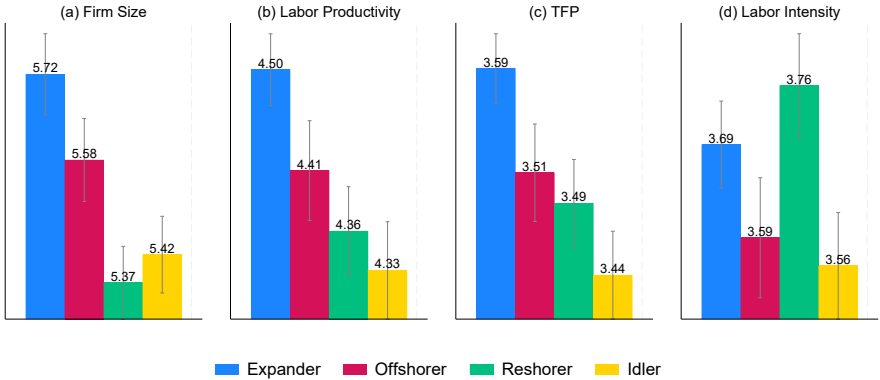
- There exists a strong persistence in investment type.
  - The probability of staying in the current status is the highest, regardless of type.
- 70% of reshorers tend to remain as reshorers or idler next period.
  - Possibly become less competitive in longer run.

Type	Expander	Offshorer	Reshorer	Idler	Total
Expander	368 (40.4)	208 (22.8)	183 (20.1)	152 (16.7)	911 (100.0)
Offshorer	113 (24.8)	130 (28.5)	92 (20.2)	121 (26.5)	456 (100.0)
Reshorer	97 (17.0)	79 (13.8)	227 (39.7)	169 (29.6)	572 (100.0)
Idler	53 (11.5)	79 (17.1)	109 (23.6)	220 (47.7)	461 (100.0)
Total	631 (26.3)	496 (20.7)	611 (25.5)	662 (27.6)	2,400 (100.0)

Notes: Total number with transition probability in parenthesis is shown in each cell.

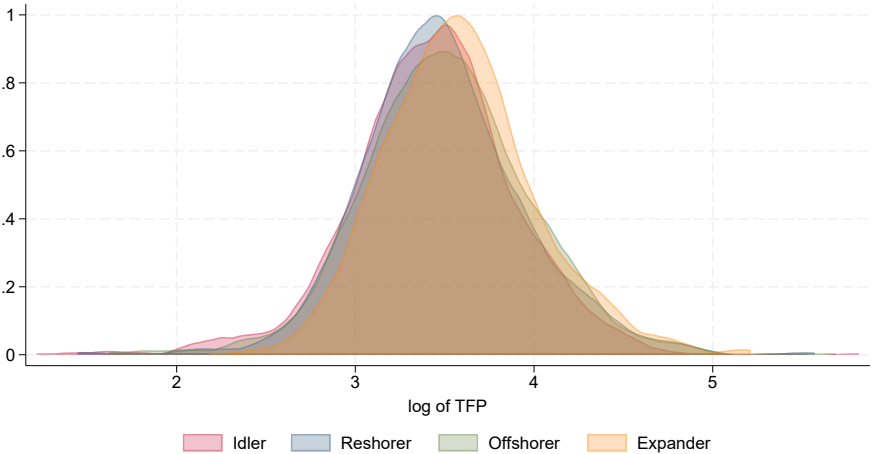
Stylized Fact 3

- There is a pecking order of types in terms of size and productivity.
  - Expander $>$ Offshorer $\geq$ Reshorer $\geq$ Idler.
- Reshorers are more labor intensive, despite their smaller employment size.



Notes: Values are expressed as lagged logs.

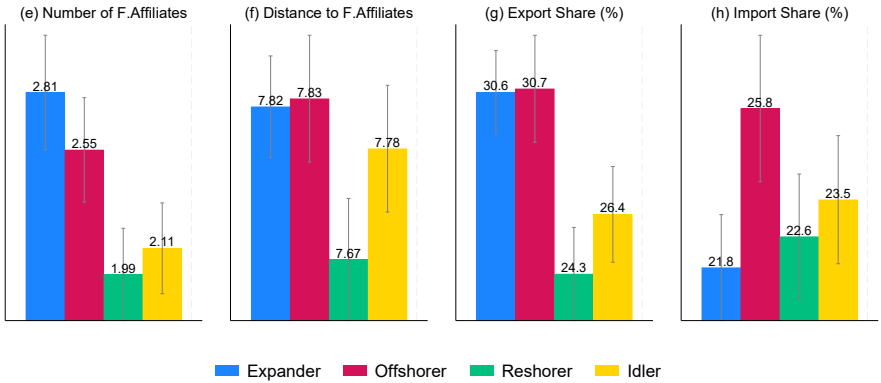
TFP Distribution by Investment Type



Notes: Values are expressed as lagged logs.

Stylized Fact 4

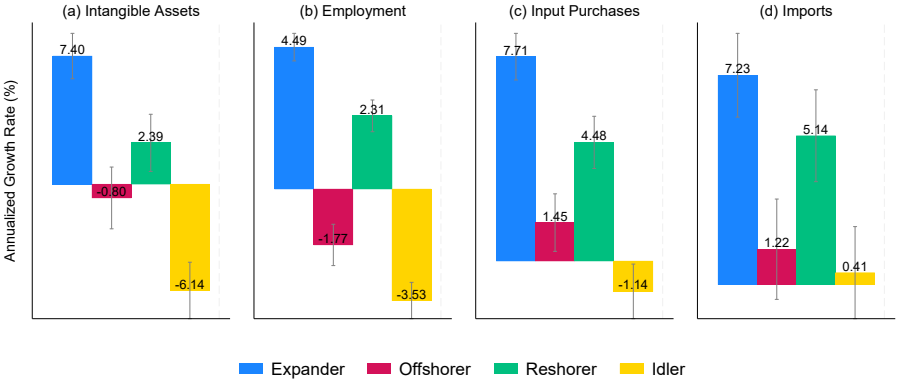
- Reshorers are initially less engaged in foreign operations.
  - Distance increases fixed sunk costs in foreign affiliates (Antras et al. 2017).



Notes: Values are expressed with a lag. Number of f.affiliates is the weighted sum of the equity shares. Distance to f.affiliates is the weighted average of the log distance.

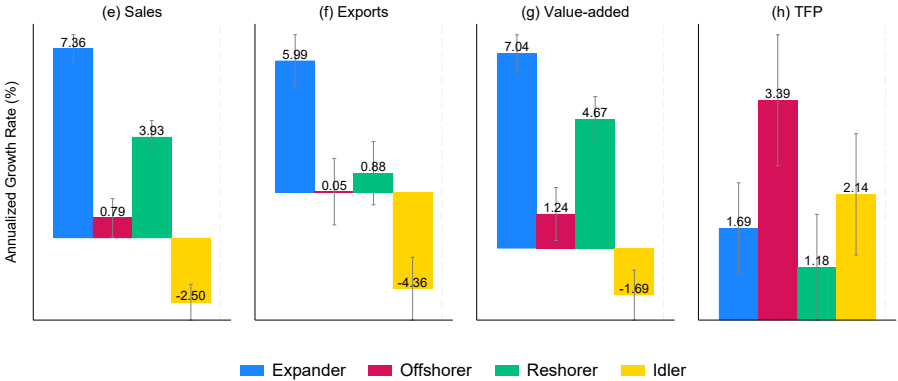
Stylized Fact 5

- Reshorers employ more workers and purchase more inputs (including imports) than offshorers.
  - Imports growth $>$ Input purchases growth $\Leftrightarrow$ Higher share of imported inputs



Stylized Fact 5

- Reshorers record higher sales and value-added than offshorers.
- However, reshorers exhibit the lowest productivity growth.
  - Offshorers shows the opposite pattern.



Summary of the Facts

- There has been a non-trivial mass of reshorers (and offshorers) after the GFC.
  - A positive correlation btw. I_O and I_F, but many firms defy the relationship.
- Persistency exists in the investment type.
  - 70% of reshorers become either reshorer or idler.
- Firm size and productivity may determine investment type (pecking order).
- Reshorers tend to be small, less active in foreign business, and labor intensive.
  - They might have chosen reshoring due to their lack of fundamental capability.
- Reshoring comes with more employment, but at the cost of inefficiency.
  - The opposite is true for offshorers.

Testable Hypotheses

1. High-productivity firm becomes expander vs. low-productivity firm becomes idler. Middle-productivity firm strategically selects either offshoring or reshoring.
   - Consistent with the literature (Antras & Helpman 2004, Helpman et al. 2004)
   - But not emphasized in the discussion of reshoring.

2. Prior experience in foreign operation and related fixed costs are a key factor of the strategic selection of production location.
   - Consistent with recent papers (e.g., Antras et al. 2017)
   - But empirical evidence is scarce.

3. External factors related to production costs matter for MNCs' investment.
   - Consistent with the rich literature

A Simple Empirical Model

- To test the hypotheses, employ a multinomial Logit model as follows.

$$log\left[\frac{p(Y_{fit}=k|X)}{p(Y_{fit}=2|X)}\right]=\alpha_k+X_{fit}\beta_k,\ \ k=1,3,4.$$

  - f is firm, i is industry, t is time, and k is investment type.
  - $k=2$ is offshorer which is the baseline in the model.

- Explanatory variable group 1: (lagged) internal factors
  - *logTFP*: log of TFP estimates (based on Ackerberg et al. 2015)
  - *FirmSize*: log of employment
  - *R&D Intensity*: log of (real) R&D investment per worker
  - *LaborIntensity*: log of wage bills per tangible assets
  - *#.F.Affiliates*: log of the number of foreign affiliates
  - *Distance.F.Aff.*: log of (weighted) distance to foreign affiliates

A Simple Empirical Model

- Explanatory variable group 2: (lagged or growth of) external factors
  - $Foreign.LCost$: log of labor unit cost in Foreign (ILO, avg. monthly earnings)
  - $\widehat{MinWage}_{KOR}$: growth of minimum wage rate in Korea
  - $Foreign.CTax$: log of coporate tax rate in Foreign (OECD Stat Database)
  - $Domestic.CTax$: log of corporate tax rate in Korea (OECD Stat Database)
  - $SupplyCA$: log of supplying sectors' RCA in Foreign, weighted by their input share (WITS GVC Database, Korean IO Table 2010)
  - $MarketAccess$: log of weighted country-level GDPs (PWT10.0, CEPII Database)
    - ⋆ The weight is the inverse of distance from the host country
- All definitions are consistent with the literature.
- The key issue is how to aggregate into a single "Foreign" country.

Construction of Firm-specific External Factor Variables

- Construct weighted averages of each host country (and industry) characteristic with the weight being:

$$wt_{fict} = \frac{max(Vshare_{fict},\ Vshare_{\cdot ict})}{\sum_{c \in C} max(Vshare_{fict},\ Vshare_{\cdot ict})}$$

  - $c \in C$ is host country where a firm f invests
  - $Vshare_{fict} = \frac{V_{fict}}{\sum_{c \in C} V_{fict}}$ with V_{fict} = firm f's FDI stock in country c
  - $Vshare_{\cdot ict} = \frac{V_{\cdot ict}}{\sum_{c \in C} V_{\cdot ict}}$ with $V_{\cdot ict}$ = industry i's FDI stock in country c

- The intuition is...
  - Even without investing, f may consider some countries as potential destinations.
  - To reflect this, the countries get weights in proportion to how much f's industry invested in them.

Construction of Firm-specific External Factor Variables

- An alternative weighting method is:

$$\tilde{w}_{fict}(\lambda) = \frac{\lambda Vshare_{fict} + (1-\lambda) Vshare_{.ict}}{\sum_{c \in C} (\lambda Vshare_{fict} + (1-\lambda) Vshare_{.ict})}$$

  - $c \in C$: host country where a firm f invests
  - $Vshare_{fict} = \frac{V_{fict}}{\sum_{c \in C} V_{fict}}$ with V_{fict} = firm f's FDI stock in country c
  - $Vshare_{.ict} = \frac{V_{.ict}}{\sum_{c \in C} V_{.ict}}$ with $V_{.ict}$ = industry i's FDI stock in country c
  - $\lambda \in [0, 1]$: a parameter balancing the influence of firm- and industry-level shares

- $\tilde{w}_{fict} = 0.5$ yields qualitatively similar estimation results.

Estimation Result

Table: Estimated Relative Risk Ratios

	Expander	Reshorer	Idler		Expander	Reshorer	Idler
Internal Factors				External Factors			
logTFP	1.480***	0.933	0.713**	*Foreign.LCost*	0.830	2.403**	2.801**
R&D Intensity	1.125***	1.044	0.934	$\widehat{MinWage}_{KOR}$	0.825***	0.920***	1.060*
FirmSize	1.159***	0.921	0.878*	*Foreign.CTax*	1.035	0.989	0.970
LaborIntensity	1.318***	1.328***	0.902	*Domestic.CTax*	1.098	0.777	0.938
#.F.Affiliates	0.943	0.830**	0.951	*SupplyCA*	0.507***	0.627**	0.905
Distance.F.Aff.	0.882*	0.720***	0.873	*MarketAccess*	1.730	0.501	0.535

Notes: Number of observations is 2,985. The baseline category is offshorer ($k = 2$). All columns include 2-digit industry fixed effects. Estimated coefficients are converted to relative risk ratios (RRRs). Standard errors are clustered at the firm-level in parenthesis. ***, **, and * indicate 1%, 5%, and 10% significance level, respectively.

Estimation Result with Investment changes $\geq 10\%$

Table: Estimated Relative Risk Ratios

	Expander	Reshorer	Idler		Expander	Reshorer	Idler
Internal Factors				External Factors			
logTFP	1.703***	0.907	0.705*	*Foreign.LCost*	1.233	3.441*	5.744***
R&D Intensity	1.165**	0.990	1.002	$\widehat{MinWage}_{KOR}$	0.753***	0.892**	1.001
FirmSize	1.121	0.807**	0.842	*Foreign.CTax*	1.012	0.991	0.965
LaborIntensity	1.544***	1.529***	0.949	*Domestic.CTax*	0.925	0.904	0.882
#.F.Affiliates	0.966	1.160	1.484**	*SupplyCA*	1.150	0.618	0.486
Distance.F.Aff.	0.860	0.636***	0.683***	*MarketAccess*	0.601	0.253*	0.212*

Notes: Number of observations is 1,551. The baseline category is offshorer ($k = 2$). All columns include 2-digit industry fixed effects. Estimated coefficients are converted to relative risk ratios (RRRs). Standard errors are clustered at the firm-level in parenthesis. ***, **, and * indicate 1%, 5%, and 10% significance level, respectively.

Concluding Remarks

- The estimation results are consistent with the three hypotheses.
  - Reshorers are smaller and less productive than expanders.
  - They have limited global presence and are more footloose than offshorers.
  - Domestic and foreign labor costs influence reshoring decision.
- Trade-off exists between offshoring and reshoring.
  - Short-term domestic jobs vs. long-term competency
- Reshoring alone is not a sufficient policy goal.
  - Typical reshorers resemble a prodigal son returning home—not a triumphant king.
  - Promote tech adoption over replicating low-productivity processes.
- Better to encourage productive firms to grow at home and become expanders.
  - Domestic business climate matters.