Offshoring vs. Reshoring: A Firm Investment Approach

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Motivation

- Slowdown in global trade and GVC expansion after the global financial crisis
  - Slowbalization or Deglobalization?
- 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).

Questions

- Did some firms really return?
  - 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

Our Approach

- The questions are addressed by looking at multinational's investment decision.
  - Reshoring: firm's domestic investment coupled with its foreign divestment (or at least no more foreign investment).
  - Offshoring: opposite of the reshoring
- Consistently, we classify multinational's global investment into four types.
  1. Expander: investment in both home and foreign countries
  2. Offshorer: investment in foreign countries, but not in home country
  3. Reshorer: investment in home country, but not in foreign countries
  4. Idler: investment in neither home nor foreign countries (including divestment).
- Characteristics of reshorer are then compared with other types.
  - For the comparison, firms must be a multinational at least in the initial period.

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, technology adoption, 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.

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. 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
  - More than 80% of the reshorers show negative growth of FDI stock (not zero).

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.

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

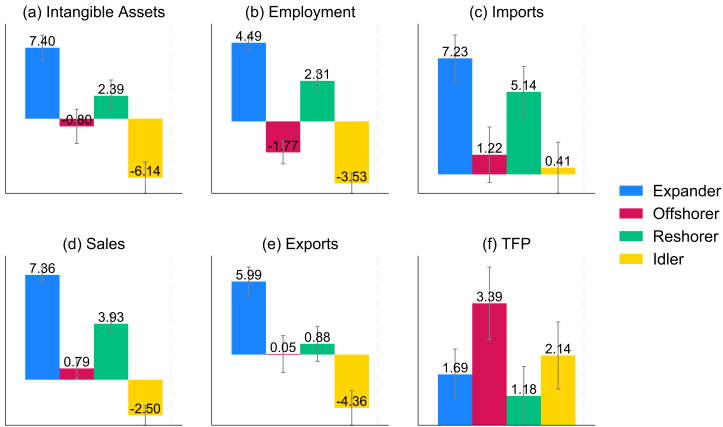
Table: Transition Matrix of Investment Type

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

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

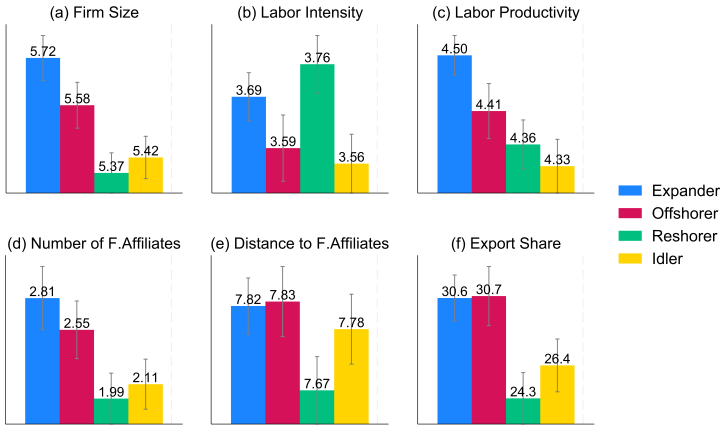
Stylized Fact 3

- Reshorers employ more workers and record higher sales than offshorers.
  - However, reshorers exhibit the lowest productivity growth.
  - Offshorers shows the opposit pattern.



Stylized Fact 4

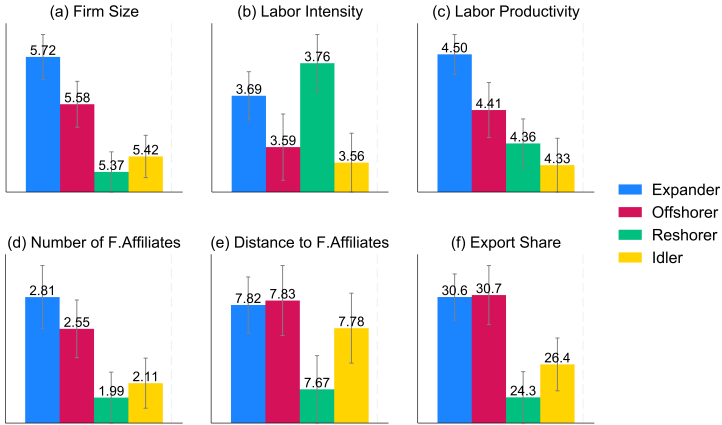
- There is a pecking order of types in terms of size and productivity.
  - Expander $>$ Offshorer $\geq$ Reshorer $\geq$ Idler.



Notes: All variables are shown in lagged values; export share=exports in sales.

Stylized Fact 5

- Reshorers are less experienced in foreign business at the first place.
- Reshorers tend to be more labor intensive, despite their smaller employment size.



Notes: All variables are shown in lagged values; export share=exports in sales.

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.
- Reshoring comes with more employment, but at the cost of inefficiency.
  - The opposite is true for offshorers.
- 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.

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 conventional theory (e.g., Helpman et al. 2004),
   - But less emphasized in the discussion of offshoring and 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 lacks empirical evidence.

- 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
  - *MarketAccess*: log of weighted country-level GDPs (PWT10.0, CEPII Database)
    - The weight is the inverse of distance from the host country
  - *Foreign.CTax*: log of coporate tax rate in Foreign (OECD Stat Database)
  - *Domestic.CTax*: log of corporate tax rate in Korea (OECD Stat Database)
  - *Foreign.LCost*: log of labor unit cost in Foreign (ILO, avg. monthly earnings)
  - $\widehat{MinWage}_{KOR}$: growth of minimum wage rate in Korea
  - *SupplyCA*: log of RCA by country & industry in Foreign (WITS GVC Database, Korean IO Table 2010)
- All definitions are consistent with the literature.
- The issue here is how to construct a single "foreign country".

A Simple Empirical Model

- To obtain firm-specific external factor variables, we construct weighted averages of each host country (and industry) characteristic with the weight being:

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

  - $c \in C$ 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
  - $Vshare_{.ict} = \frac{V_{.ict}}{\sum_{c \in C} V_{.ict}}$ with $V_{.ict}$ = industry i's FDI stock in country c

- The intuition is...
  - Even if a firm f did not invest in some countries, it may consider them as potential investment destinations. To reflect this, the countries get weights in proportion to how much f's industry invested in them.

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 2,995. The baseline category is offshorer (k=2). 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 result is consistent with the three hypotheses.
  - Also, well explained by the conventional theories
- Trade-off exists between offshoring and reshoring
  - Gaining workers comes along with losing competency (perhaps for a long time).
- Reshoring policies should be cordinated with other policies.
  - Productivity: R&D sudsidies, factory smartization, management consulting, ...
  - Radical increases in minimum wage in Korea might have hampered firms to reshore.
- Arguably, simple promotion of domestic investment is better.
  - With no conditions for investment incentives.