FDI and the Task Content of Domestic Employment for U.S. Multinationals

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All views are those of the authors and do not necessarily reflect the views

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Motivation

- U.S. multinational companies are few but large and important to the U.S. economy. stats
- U.S. multinationals are being held largely responsible for the loss of U.S. manufacturing jobs by the public.
  - "We can blame manufacturings problems and dislocations on foreigners and disloyal American multinational firms." - Washington Post (Aug 7, 2016)
  - "They see the globalization agenda as being set by large companies that successfully play one country against another." - Washington Post (April 10, 2016)
- However, we still have much to learn about how their global activities are related to their domestic operations.

This paper

- Use a matched dataset of BEA data on U.S. multinationals linked to BLS data on occupational and wage distributions to answer:
  - How do domestic employment characteristics reflect the foreign affiliate activities of US multinational manufacturers?
  - What types of firms, if any, substitute foreign labor for domestic labor?

Preview of results

- In general, FDI is positively correlated with domestic labor demand.
- However, for firms that offshore more production to foreign affiliates, foreign labor in low-income countries substitutes for domestic automated/routine tasks.
  - Firms that do more offshoring represent just 1% of sales in our sample.
  - The offshoring firms tend to be younger, on average, and smaller.

BEA dataset

- Firm-level survey of U.S. Direct Investment Abroad (2004 Benchmark survey)
  - Required of every U.S. parent company with a foreign affiliate.
  - Survey completed by parent company for its domestic operation and each of its foreign affiliates.
  - Includes data on balance sheets and income statements; property, plant, and equipment; employment and compensation of employees; U.S. trade in goods; sales of goods and services; value added; research and development activities; taxes; and external financial position.

BLS dataset

- Establishment-level survey of Occupational Employment Statistics (November 2003 to May 2006)
  - Establishments report the distribution of their employees in 801 SOC occupations along with hourly wages in 12 broad wage bands.
  - Based on three-year rotating panel
    - Large establishments surveyed with certainty over a three-year panel.
    - Probability-based sample of smaller establishments, with sample weights

The matched sample

- Matching methodology described in Handwerker, et al. (2011).
- Focused matching on largest 500 U.S.-based multinational manufacturing companies.
  - 453 of these were "good" matches.

Matched Firms

Employment totals in BEA and BLS data

BEA data from 2004 Benchmark Survey of US Direct Investment Abroad	
Total domestic employment of companies in survey	22,445,900
Employment in the companies for which the primary industry is manufacturing	7,628,500
Employment in the largest 500 of these companies	6,829,300
Employment in the 453 matching companies	6,444,300
BLS data from Occupational Employment Survey	
Weighted employment found in establishments of these 453 matched firms	5,638,849

Tasks

We consider four tasks:

- Tradeable tasks
  - "information content" - measures the extent to which an occupation might be affected by communications technologies
  - "automation/routinization" - measures the degree to which an occupation involves manual and routine tasks
- Non-tradeable tasks
  - "face-to-face" - measures the extent to which a job requires a worker's physical presence
- We add an "other" category to encompass all other tasks.

Task Employment

Labor demand

- Based on the generalization of the cost function approach in Hamermesh (1993).
  - Assume that there are two locations, home and foreign.
  - Assume that firms in each location operate a production technology that transforms N domestic factors and N^* foreign factors into output Y.

Hamermesh (1993) and Harrison and McMillan (2011)

We allow the cross-price elasticity of demand to vary by the extent of FDI:

$$\begin{aligned} \ln x_{fh} = {} & \beta_0 + \sum_h \eta_h \ln w_{ih} + \eta^* \ln w_i^* + \xi(FDI_f * \ln w_i^*) \\ & + \omega \ln r_i + \omega^* \ln r_i^* + \chi \ln t_f + \chi^* \ln t_f^* + \alpha \ln P_i + \alpha^* \ln P_i^* \\ & + \gamma C_f + \varepsilon \end{aligned}$$

Elasticity

Measures of FDI

- Intensive and extensive margin of FDI
  - Index of global scope (Mataloni, 2011):
    $\left\{\sum_C \left(G_{US} - G_c\right) \frac{y_c}{y_{ww}}\right\} * R$
- Intrafirm goods trade
  - US parents' imports of goods from foreign affiliates
  - US parents' exports of goods to foreign affiliates for further processing
  - US parents' exports of goods to foreign affiliates for resale
  - US parents' exports of goods for other purposes

Observation #1:

In firms with more expansive global scope, the demand for foreign and domestic labor are positively correlated.

	Automation/ routinization	Information content-related	Face-to-face interaction	Other
Log affiliate wage	0.08	−0.01	−0.17	−0.05
	(0.04) ∗ ∗	(0.04)	(0.09)∗	(0.02) ∗ ∗
Global scope*Log affiliate wage	−0.15	−0.13	−0.19	−0.14
	(0.02)∗∗∗	(0.02)∗∗∗	(0.05)∗∗∗	(0.01)∗∗∗
Controls for worldwide size of firm	x	x	x	x
Controls for age of firm	x	x	x	x
N	386	386	386	386
R^2	0.684	0.684	0.684	0.684

Accounting for heterogeneity in FDI activity

When allowing for the mix of intrafirm trade to affect the cross-price elasticity of demand for foreign labor, the cross-price elasticity can be expressed as:

$$\eta + \xi_1 X_{furtherprocessing} + \xi_2 X_{resale} + \xi_3 M$$

Observation #2:

More intrafirm trade with high-income countries is associated with higher demand for domestic labor in tradeable tasks.

	Automation/ routinization	Information content-related	Face-to-face interaction	Other
Log affiliate wage	0.16	−0.03	0.07	−0.01
in high-income countries	(0.05)***	(0.04)	(0.11)	(0.03)
Exports to affiliates for further processing	−1.20	1.05	2.04	−0.46
* Log high-income wage	(0.71)*	(0.70)	(1.72)	(0.53)
Exports to affiliates for resale	−0.81	−0.30	1.25	0.07
* Log high-income wage	(0.61)	(0.60)	(1.47)	(0.45)
Imports from affiliates	−0.33	−0.15	−0.49	−0.12
* Log high-income wage	(0.11)***	(0.11)	(0.27)*	(0.08)
Controls for worldwide size of firm	×	×	×	×
Controls for age of firm	×	×	×	×
N	337	337	337	337
R^2	0.652	0.652	0.652	0.652

Observation #3:

In firms engaging in more exports for further processing, the demand for foreign labor in low-income countries is negatively correlated with demand for domestic labor in automated/routine tasks.

	Automation/ routinization	Information content-related	Face-to-face interaction	Other
Log affiliate wage	−0.03	0.04	−0.02	0.11
in low-income countries	(0.06)	(0.05)	(0.14)	(0.04) ∗ ∗
Exports to affiliates for further processing	5.16	3.18	−6.97	1.14
* Log low-income wage	(2.09) ∗ ∗	(2.06)	(4.99)	(1.55)
Exports to affiliates for resale	−1.31	−6.37	2.52	−3.90
* Log low-income wage	(2.90)	(2.87) ∗ ∗	(6.91)	(2.14)∗
Imports from affiliates	−3.28	−4.22	5.48	0.31
* Log low-income wage	(1.74)∗	(1.72) ∗ ∗	(4.17)	(1.29)
Controls for worldwide size of firm	×	×	×	×
Controls for age of firm	×	×	×	×
N	337	337	337	337
R^2	0.652	0.652	0.652	0.652

Firms with positive cross-price elasticity

In our sample, these firms represent:

- 1% of sales
- 1.8% of R&D
- 1.5% of trade
- 1.2% of intrafirm trade

Comparison of firms based on cross-price elasticity

	Age	Size	Ratio of FDI in low- to high-income countries	Share of foreign affiliate employment in different 3-Digit NAICS	Number of parent industries
Firms with positive cross-price elasticity of demand					
Mean	20.0	8958	0.01	0.07	2.31
Std Dev	20.1	8246	0.02	0.15	1.82
Firms with negative cross-price elasticity of demand					
Mean	38.6	28355	0.20	0.35	4.00
Std Dev	30.8	56417	3.00	0.37	3.24

Other differences

- Are offshoring firms instead keeping more innovation activities at home?
  - Establishment-level employment in creativity tasks and science and technology occupations are smaller in firms that offshore automated/routine tasks.
- Are they keeping most productive automated/routine tasks at home?
  - Establishment-level wages for domestic automated/routine tasks are higher in firms that offshore these tasks.

Future work using this dataset?

- Are there other margins of heterogeneity that might be of interest?
  - characteristics of destination countries
  - number of activities performed by the affiliates
  - organizational structure
  - headquarters
- Is there interest in matching additional benchmark surveys?

Takeaways and questions

- Cooperation and interest from the states are important. How do we encourage states to become stakeholders in such projects?
- Matching is an imperfect science. How should errors be estimated?
- Future matching would be greatly facilitated by a uniform enterprise identifier across all agencies. What do you see as the potential of such an identifier?