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SPILLOVER EFFECTS OF FOREIGN DIRECT INVESTMENT IN THE U.S. LABOR MARKET

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Abstract

Annual inward foreign direct investment (FDI) reached 246.2 billion dollars in 2019 in the United States, constituting the need to uncover the impact of FDI on economic outcomes. Our paper examines the impact of having foreign affiliates on regional labor markets. We investigate the spillover effects over geographical and industrial linkages. The results show that the county's employment level rises with the establishment of foreign subsidiaries. The employment level also rises in the upstream industries of the foreign affiliates through backward linkages.

Introduction

- Annual inward FDI in the United States has risen to 246.2 billion dollars doubled to that of outward FDI [7].
- FDI benefits domestic economic growth through industry's vertical linkages [5].
- Domestic firms may lose market share to the foreign affiliates in the same industry [4].
- As depicted in Figure 1, FDI is concentrated in economically advanced States where agglomeration economies might occur [2].
- We consider industrial and spatial linkages to examine the impact of inward FDI in U.S. labor markets.
- We test the following hypotheses:
 1. The establishment of foreign subsidiaries increases the host county's employment level.
 2. The employment level increased in other industries via backward linkage of the supply chain.
 3. The effects persist in neighboring counties within the same commuting zone.

Data

- We care about any greenfield FDI that defines the MNE's foreign subsidiary establishment. M&A is not considered in our study.
- We obtained greenfield establishment data from fDiMarkets. The data contains city-level host locations and project dates. We aggregated all FDI toward the U.S. from 2003 to 2018 into the annual county level.
- We use county's employment data from the County Business Patterns (CBP) published by Census Bureau. CBP suffers from industry code discordance over time and its inconsistent suppression over industries [3]. Also, Census perturbs cells with small employment counts since 2017. Thus, we constructed a consistent panel from 2003 to 2016 that resolved the above issues [3].
- The final data includes 68 industries for 3,197 counties and 903 commuting zones.

Methodology

We estimate the following regression specification:

$$y_{ikt} = \alpha_{it} + \alpha_{kt} + \beta_0 FDI_{ikt-1} + \beta_1 \sum_{l \neq k} (w_l * FDI_{ilt-1}) + \epsilon_{ikt}, \quad (1)$$

for county i , industry k , and year t .

- y is the log of employment level.
- We include two-way fixed effects (α_{it} and α_{kt}) to capture unobservable factors affecting employment levels.
- FDI is the log of new FDI that represents regional FDI shock.
- β_0 captures the direct effects of FDI in a certain industry.
- β_1 captures the spillover effects of FDI via industrial (backward) linkages. We weighted the spillover effects by $w_l \in [0, 1]$.

- Weights are based on the industry's backward linkage (BL) of supply chain [1].
- We used the 2007 Input-Output (IO) supply-to-use table provided by the Bureau of Economic Analysis.
- From the Leontief IO model, we observe that

$$\begin{pmatrix} x_k \\ \mathbf{x}_l \end{pmatrix} = \begin{pmatrix} \mathbf{A}_{kk} & \mathbf{A}_{kl} \\ \mathbf{A}_{lk} & \mathbf{A}_{ll} \end{pmatrix} \begin{pmatrix} x_k \\ \mathbf{x}_l \end{pmatrix} + \begin{pmatrix} f_k \\ \mathbf{f}_l \end{pmatrix}, \quad (2)$$

where x is output, f is final demand, and \mathbf{A} is the direct input coefficient matrix.

- The BL impacts of the unit output change in industry k on the output of other industries can be calculated by $\Delta \mathbf{x}_l = (\mathbf{I} - \mathbf{A}_{ll})^{-1} \mathbf{A}_{lk}$.
- We assign the sum of each element of $\Delta \mathbf{x}_l$ to each industry as the weight w in equation (1).

* Given the substantial scale differences between small regions, we weight our estimates for the population. This weighting approach allows us to correct for heteroskedasticity in the error term [6], and alleviate the measurement error problem. More populated regions show a higher signal-to-noise ratio, which is an issue, especially when dealing with a low-frequency outcome.

* We added a small value before log-transformation for the OLS estimation to account for zeroes in the observation. We compare these results with the count model estimates using Pseudo Poisson Maximum Likelihood.

Results

Table 1. The impact of FDI on U.S. labor market

	OLS				PPML			
	County		Commuting Zone		County		Commuting Zone	
	Count	Amount	Count	Amount	Count	Amount	Count	Amount
Direct	0.146*** (0.032)	0.028*** (0.009)	0.116*** (0.025)	0.028*** (0.007)	0.121*** (0.0420)	0.022* (0.012)	0.045** (0.019)	0.012*** (0.004)
Spillover	0.107*** (0.034)	0.035*** (0.008)	0.063*** (0.022)	0.023*** (0.006)	0.03** (0.013)	0.008 (0.00524)	0.01 (0.011)	0.004 (0.003)
Observations	1,793,304	1,793,304	595,884	595,884	1,793,304	1,793,304	595,884	595,884
R-squared	0.926	0.925	0.945	0.944	0.955	0.953	0.958	0.958

Notes. Each column reports the estimates of individual regression results. Constant term is included but not reported in this table. Asterisks denote p-value < 0.10 (*), < 0.05 (**), or < 0.01 (***). Robust standard errors clustered at the county level in parenthesis.

Conclusions

- This research sheds light on the impact of foreign affiliates (greenfield FDI) on the U.S. labor market.
- This paper provides evidence for the effects of hosting FDI in the U.S. employment levels via industry and spatial linkages.
- We find that the host county and geographically adjacent counties (thus in the same commuting zone) directly benefited by hosting greenfield investment. The employment level also rises in the upstream industries via the supply chain.
- As depicted in Figure 1, there are substantial differences in the ability of each county to attract FDI. Over the last decade, larger states have received significantly more FDI, potentially contributing to asymmetric economic development. We will study the deflection effects of this spatial (also industrial) concentration of FDIs that abandoned regions might lose their workplace.

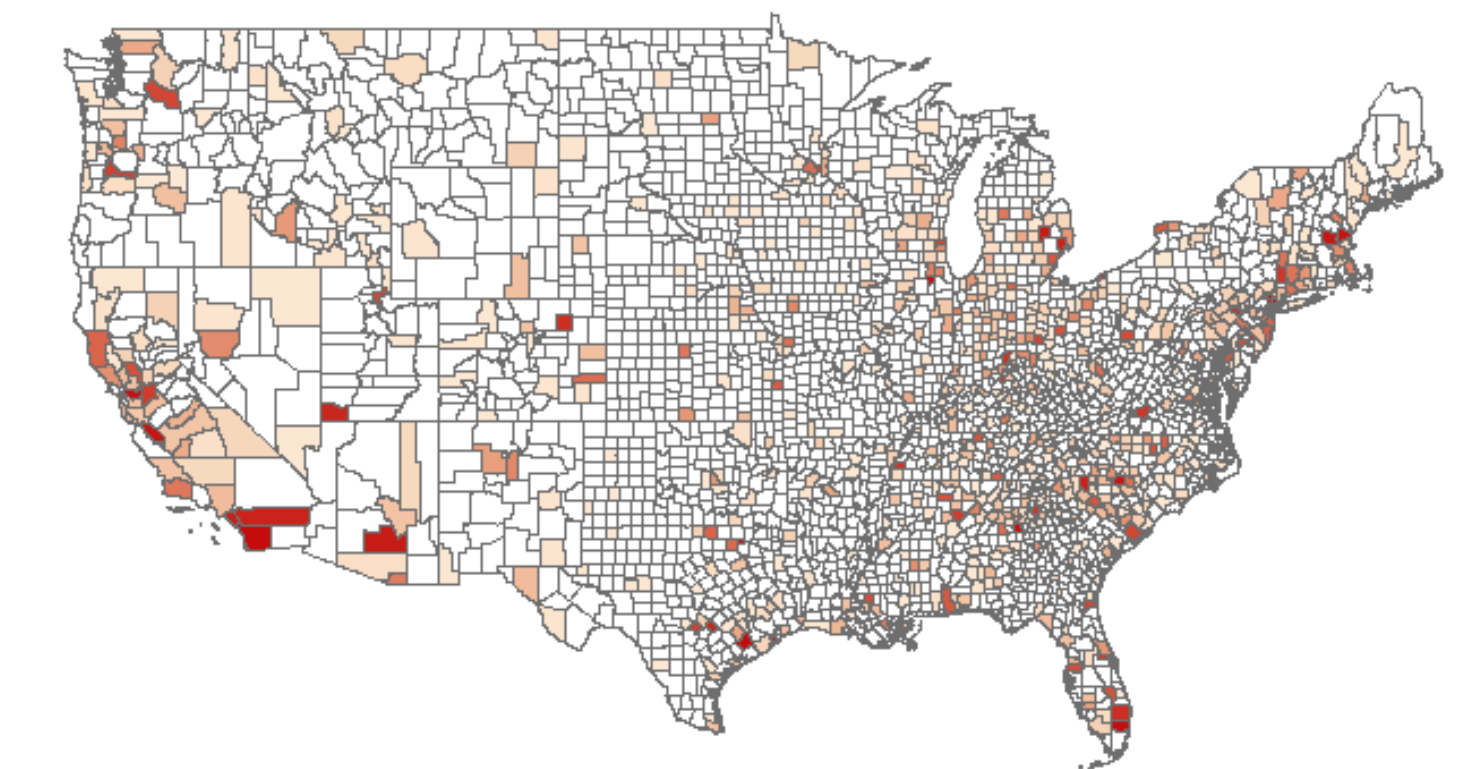


Fig. 1: Greenfield FDI projects by county

Notes. This figure shows the number of greenfield FDI projects by county from 2003 to 2016. The darker, the more FDI projects received.

References

- [1] Garrick Blalock and Paul J. Gertler. "Welfare gains from Foreign Direct Investment through technology transfer to local suppliers". In: *Journal of International Economics* 74.2 (2008).
- [2] Gustavo J. Bobonis and Howard J. Shatz. "Agglomeration, Adjustment, and State Policies in the Location of Foreign Direct Investment in the United States". In: *The Review of Economics and Statistics* 89.1 (2007).
- [3] Fabian Eckert et al. *Imputing Missing Values in the US Census Bureau's County Business Patterns*. Tech. rep. NBER Working Paper, 2021.
- [4] Jonathan E. Haskel, Sonia C. Pereira, and Matthew J. Slaughter. "Does Inward Foreign Direct Investment Boost the Productivity of Domestic Firms?" In: *The Review of Economics and Statistics* 89.3 (2007).
- [5] Beata Smarzynska Javorcik. "Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers Through Backward Linkages". In: *American Economic Review* 94.3 (2004).
- [6] Gary Solon, Steven Haider, and Jeffrey Wooldridge. "What Are We Weighting for?" In: *Journal of Human Resources* 50 (2013).
- [7] UNCTAD. *World Investment Report 2020*. United Nations Publications, 2020.