

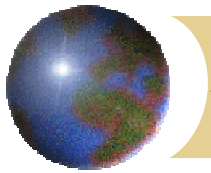
Foreign Direct Investment and Domestic Economic Activity

December 2004

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Motivation (1)

Popular intuition that foreign activity of U.S. multinationals represents diversions of domestic activity

Limited empirical support or testing of this intuition

Empirical difficulties of identifying this relationship given possibilities that other factors are driving both types of growth and the scarcity of microdata on firms

How can we arrive at a convincing test that could identify this relationship better?

Sharply accelerating rate of FDI magnifies importance of this question –
Figure 1

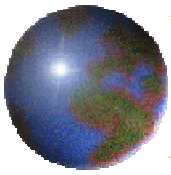
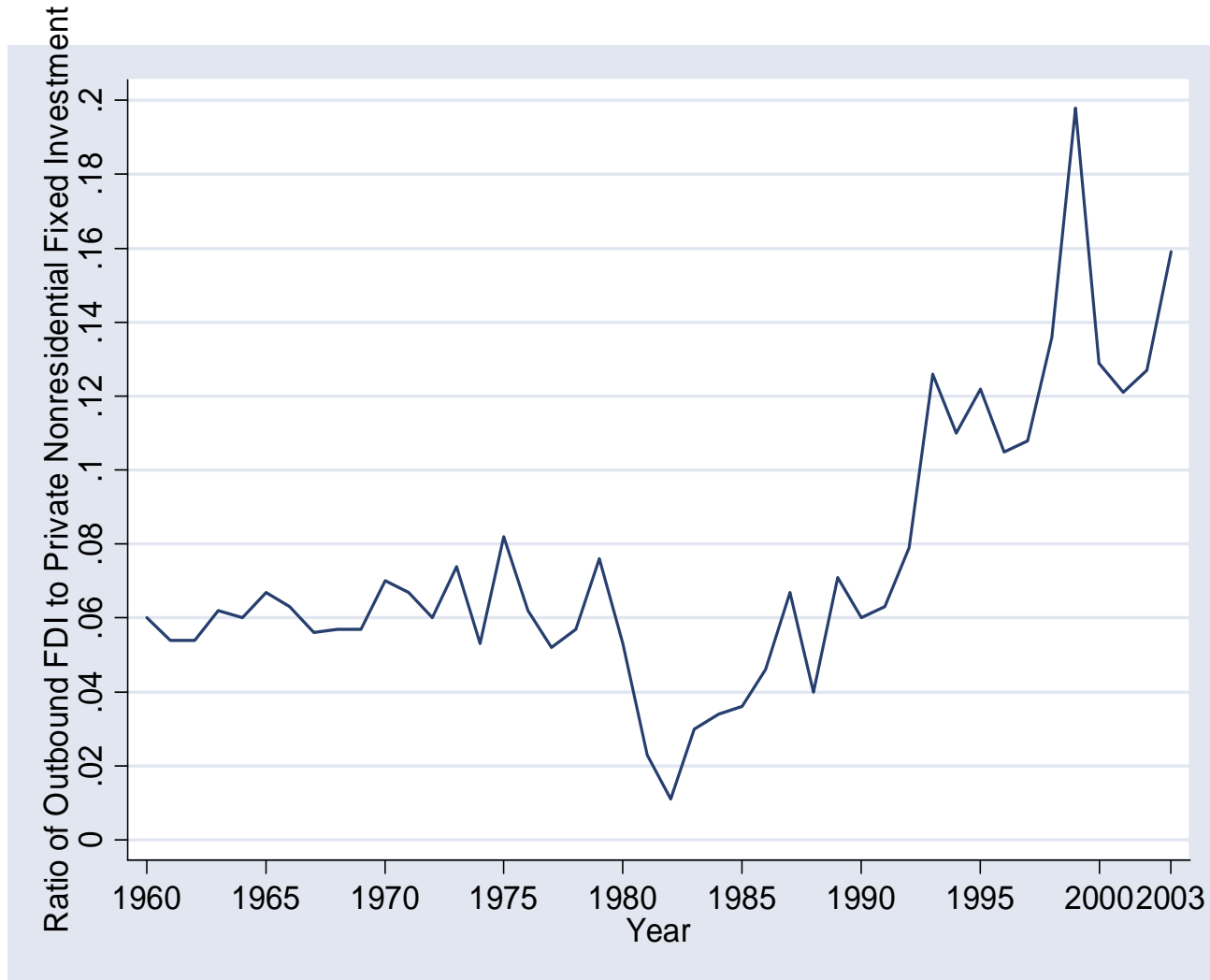
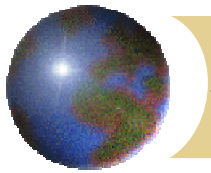


Figure 1: The Rising Importance of FDI to U.S. Economy





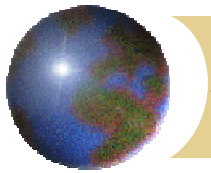
Motivation (2)

Popular intuition: Firm resources are fixed and, consequently, foreign investment is “lost” activity

An aside: this is also the view underlying much of our corporate tax policy

Alternative view: Firm value and, consequently, resources are a function of worldwide opportunities – greater foreign investment can detract or add to domestic economic activity

This remains basically an empirical question

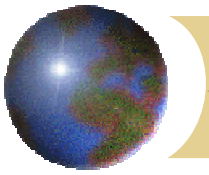


Our Approach

Employ microdata on U.S. parents with foreign operations and aggregate their foreign operations and analyze the growth of foreign operations relative to domestic operations

**Apply an instrument for foreign growth of U.S. multinationals to see if foreign growth of operations stimulates or detracts from domestic economic activity*

Analyze subtler predictions of vertical FDI theory to see if results cohere in a meaningful way



Preview of Results

OLS results suggest complementarity of foreign and domestic operations

Weighted average foreign economic growth rates appear to be suitable instruments for foreign MNC affiliate growth

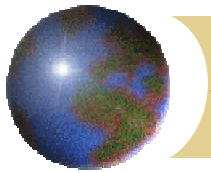
IV analysis indicates: $\Delta\$10$ foreign sales \Rightarrow $\Delta\$7$ domestic sales

$\Delta\$10$ foreign assets \Rightarrow $\Delta\$7$ domestic assets

$\Delta 1$ foreign worker \Rightarrow $\Delta 2$ domestic workers

Analysis of R&D and intrafirm trade suggests that “vertical” view of FDI leads to this complementarity

Analysis of FDI activity by income levels leads to similar results



(Very Brief) Literature Review

Alternative Views of FDI: “Horizontal” - in response to trade costs

vs.

“Vertical” – fragmented production processes

Horizontal view most consistent with notion of diversion as FDI substitutes for exports and, therefore, domestic activity

Vertical view is one that allows for complementarity given shared intangibles and intrafirm trade

Handful of empirical efforts to identify relationship between activities at home and abroad

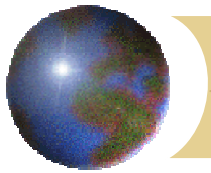
Stevens and Lipsey (1995) – handful of firms

Feldstein (1995) – national income aggregates

Devereaux and Freeman (1995) – aggregates

Several efforts to study impacts on labor demand and wages at home

Harrison and McMillan (2004), HMS (2003), Slaughter, Brainard/Riker (1997)



First stage results (1)

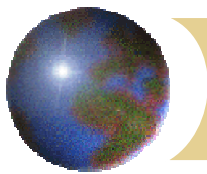
Dependent Variable: Growth in some measure of foreign
Economic Activity – sales, assets, PPE, employees

$$\frac{EA_{i,t}^* - EA_{i,t-1}^*}{(EA_{i,t-1}^* + EA_{i,t-1}) + (EA_{i,t}^* + EA_{i,t})}$$

Independent Variable: Weighted economic growth rate
of foreign economies where weights correspond to
distribution of lagged foreign PPE

$$\frac{\sum_{j=1}^n PPE_{ijt-1} * GDP \text{ growth}_{jt}}{\sum_{j=1}^n PPE_{ijt-1}}$$

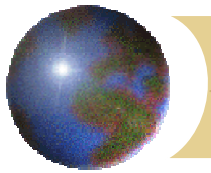
i for parent
t for period
j for country
* foreign



First stage results (2) – Table 2

The Relationship between Foreign Affiliate Growth and Host Country Growth

<i>Dependent Variable:</i>	Foreign Affiliate Sales Growth Rate	Foreign Affiliate Asset Growth Rate	Foreign Affiliate Net PPE Growth Rate	Foreign Affiliate Employment Growth Rate
	(1)	(2)	(3)	(4)
Constant	-0.0180 (0.0263)	-0.0336 (0.0295)	-0.0619 (0.0217)	-0.0277 (0.0334)
GDP Growth Rate	0.4592 (0.0627)	0.4652 (0.0696)	0.3152 (0.0513)	0.1718 (0.0790)
Period Fixed Effects?	Y	Y	Y	Y
No. of Obs.	2,510	2,510	2,382	2,329
R-Squared	0.0584	0.0434	0.0191	0.0147



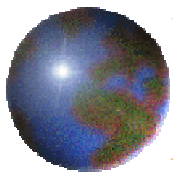
OLS and IV results (1)

Dependent Variable: Growth in domestic *Economic Activity*

$$\frac{EA_{i,t} - EA_{i,t-1}}{(EA_{i,t-1}^* + EA_{i,t-1}) + (EA_{i,t}^* + EA_{i,t})}$$

Independent Variable: Growth in foreign *Economic Activity*

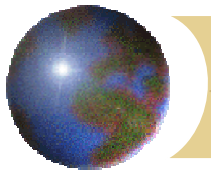
$$\frac{EA_{i,t}^* - EA_{i,t-1}^*}{(EA_{i,t-1}^* + EA_{i,t-1}) + (EA_{i,t}^* + EA_{i,t})} \quad \text{OR} \quad \frac{EA_{i,t}^* - EA_{i,t-1}^*}{(EA_{i,t-1}^* + EA_{i,t-1}) + (EA_{i,t}^* + EA_{i,t})}$$



OLS and IV results (2) – Table 3

The Relationship between Changes in Foreign Affiliate Activity and Domestic Activity

<i>Dependent Variable:</i>	Domestic Sales Growth Rate		Domestic Asset Growth Rate		Domestic Net PPE Growth Rate		Domestic Employment Growth Rate	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.2198 (0.0176)	0.1751 (0.0482)	0.3277 (0.0183)	0.2917 (0.0538)	0.9912 (0.0169)	0.1408 (0.0449)	0.0240 (0.0141)	-0.0376 (0.0422)
Foreign Affiliate Sales Growth	0.4406 (0.0354)	<u>0.7059 (0.2710)</u>						
Foreign Affiliate Asset Growth			0.4715 (0.0381)	<u>0.7039 (0.3255)</u>				
Foreign Affiliate Net PPE Growth					0.5088 (0.0652)	<u>1.6296 (0.4941)</u>		
Foreign Affiliate Employment Growth							0.4304 (0.0364)	<u>1.8855 (0.9195)</u>
Period Fixed Effects?	Y	Y	Y	Y	Y	Y	Y	Y
IV w/ GDP Growth?	N	Y	N	Y	N	Y	N	Y
No. of Obs.	2,510	2,510	2,510	2,510	2,382	2,382	2,329	2,329
R-Squared	0.0956		0.1220		0.6960		0.0920	



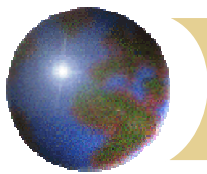
If complementarity is true, what is driving it? (1)

Returning to the “vertical” view of FDI, this view would suggest that similar patterns should be evident when looking at R&D and intrafirm trade

- as overseas operations expand, this stimulates activity in the production of intangibles at home and exports from home

Revisit previous analysis but with alternative dependent variables of R&D growth and growth in total intrafirm trade and its components

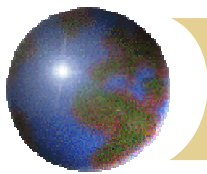
Consider if these effects differ by income level of countries where vertical effects are likely to be largest



If complementarity is true, what is driving it? (2)

The Relationship between Foreign Affiliate PPE Growth and Types of Parent Activity

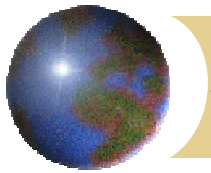
<i>Dependent Variable:</i>	Parent R&D Growth Rate		Total Related Party Trade Growth Rate		Growth Rate of Parent Imports from Affiliates		Growth Rate of Parent Exports to Affiliates	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.1045 (0.0402)	0.1700 (0.0704)	0.2609 (0.0393)	0.2583 (0.1084)	0.0618 (0.0525)	0.5924 (0.1793)	0.0133 (0.0420)	-0.0010 (0.0684)
Foreign Affiliate Net PPE Growth	0.2650 (0.0261)	<u>0.3613 (0.1932)</u>	0.3841 (0.0290)	<u>0.3891 (0.1902)</u>	0.5106 (0.0417)	0.0422 (0.3084)	0.3399 (0.0309)	<u>0.3918 (0.1989)</u>
Period Fixed Effects'	Y	Y	Y	Y	Y	Y	Y	Y
IV w/ GDP Growth?	N	Y	N	Y	N	Y	N	Y
No. of Obs.	2,145	2,145	2,412	2,412	1,993	1,993	2,340	2,340
R-Squared	0.0521		0.0991		0.0973		0.0710	



If complementarity is true, what is driving it? (3)

The Relationship between Foreign Affiliate PPE Growth and Types of Parent Activity, by Income

<i>Dependent Variable:</i>	Total Related Party Trade Growth		Growth in Parent Exports to Affiliates	
	<i>Sample:</i> High Income	Low Income	High Income	Low Income
	(1)	(2)	(3)	(4)
Constant	0.4993 (0.1453)	-0.0205 (0.1028)	0.3329 (0.1759)	0.0985 (0.1589)
Foreign Affiliate Net PPE Growth	0.0321 (0.2477)	0.6857 <u>(0.2797)</u>	0.1562 (0.2952)	0.5636 <u>(0.2905)</u>
Period Fixed Effects	Y	Y	Y	Y
IV w/ GDP Growth?	Y	Y	Y	Y
No. of Obs.	1,207	1,205	1,156	1,184



Robustness of results

Is the instrument valid?

What if industries face shocks and countries are v. highly undiversified?
Then, it is possible that our instrument isn't valid.

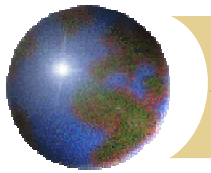
Conducting the same analysis with industry-period controls doesn't diminish the results

What if investment and trade by firms are highly correlated?

What if high-growth firms go to high-growth countries?

What does this imply in general equilibrium?

In GE, prices move in response and it is conceivable that aggregate implications/results could be different



Implications/Conclusions

Popular intuition receives no empirical support and is contradicted

Alternative view of complementarity finds support and more subtle predictions related to vertical FDI find support

IV analysis indicates: $\Delta\$10$ foreign sales \Rightarrow $\Delta\$7$ domestic sales

$\Delta\$10$ foreign assets \Rightarrow $\Delta\$7$ domestic assets

$\Delta 1$ foreign worker \Rightarrow $\Delta 2$ domestic workers

Debates on the taxation of multinationals are grounded in the logic of the popular intuition (Capital Export and Import Neutrality)

Alternative view and empirical evidence of this paper support newer welfare metrics (Capital Ownership Neutrality) and, consequently, reduced burdens on international income of U.S. firms