

# The effects of FDI on corporate geography

Rita Cappariello   Stefano Federico   Roberta Zizza

Bank of Italy

Wien, 3rd FIW Research Conference  
11 December 2009

# Introduction

- Effects of outward FDI on investing firms in the home country. Two main approaches in previous literature:
  - 1 Estimate labour demand functions to see whether employment in parent company is substitute or complement to employment in foreign affiliates (Brainard and Riker 1997, Braconier and Ekholm 2000)
  - 2 Use matching to identify control group of similar firms (Egger and Pfaffermayr 2003, Barba Navaretti and Castellani 2004 etc.)
- Both approaches treat parent company as a *single unit*
- This paper looks instead at what happens *inside* the parent company in the home country

# This paper

- Specifically, this paper looks at what happens inside *multi-plant firms* in the home country
- Distinction between plants located close to the headquarters area (HQ plants) and plants located far from the headquarters area (non-HQ plants)
- Our research question: Does employment (or investment) grow at a different rate in HQ plants, relatively to non-HQ plants of the same firm? Is there any difference between FDI firms and non-FDI firms?
  - 1 Multi-plant firms have a very large share on total employment and output
  - 2 Theory suggests that FDI should have a differential impact between HQ and non-HQ employment
  - 3 HQ and non-HQ plants belonging to the same firm are exposed to the same FDI treatment: selection bias is reduced

# How important are multi-plant firms?

- Multi-plant firms are a very common feature of advanced economies
  - 1 In our sample of Italian industrial firms, multi-plant firms account for more than 60% of employment
  - 2 In the U.S. multi-plant firms account for 78% of manufacturing employment (Bernard and Jensen 2007)
- Uneven geographical distribution of non-HQ plants
  - 1 In our sample non-HQ plants represent 16% of employment in the North-West of Italy but 50% in the South
  - 2 Concerns about Southern manufacturing industry's *dependence on external decision centres*
- By affecting corporate geography, FDI may therefore affect the overall geography of economic activity in the home country

# Why should FDI have an impact?

- Vertical FDI: labour-intensive activities are relocated abroad, hence plants in the home country focus on R&D, marketing (which are often HQ activities)
- Horizontal FDI: increased need for coordination activities (e.g. Human resources: HQ activities)
- Political and social pressures are stronger as one gets closer to HQ: less downsizing in HQ (Landier et al. 2009)

## Related literature

- Labour demand functions in multinational companies (mentioned above)
- Application of matching techniques to FDI decision (mentioned above)
- Bernard and Jensen (2007): compare likelihood of plant closure in single-plant, multi-plant or multinational firms - but do not distinguish between HQ and non-HQ plants
- Landier, Nair and Wulf (2009): layoffs and closures are more likely in plants located far from the headquarters - but do not look at whether this depends on FDI

- INVIND: annual survey on Italian industrial firms carried out by the Bank of Italy
- Firms with 50 employees and more
- The 2006 survey included a box of questions on FDI
- Unbalanced panel 2001-2006
- Our sample represents 12% of the universe of Italian industrial firms
- Bias on medium-large firms

# Multi-area firms

- Data on employment and investments by geographical area (4 areas of Italy)
- Information on headquarter location
- Example of a multi-area firm in our sample
  - 1 North-West (HQ area): 1,325 employees
  - 2 North-East (non-HQ area): 972 employees
  - 3 Centre (non-HQ area): 1,900 employees
  - 4 South (non-HQ area): 221 employees

# Sample

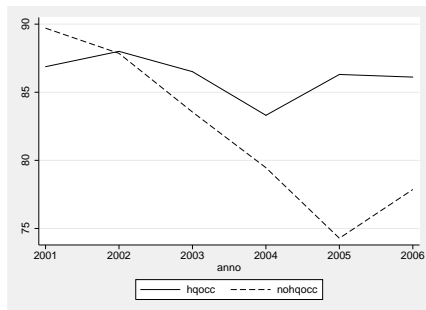
Year 2006	Multi-area firms	of which: FDI firms	Total firms	of which FDI firms
Firms	<b>305</b>	<b>91</b>	<b>1,446</b>	250
Firms-areas	787	246	1,928	405
Employment	<b>364</b>	<b>219</b>	605	287

Source: authors' elaborations on Invind data.

Units of firms and thousands of employees.

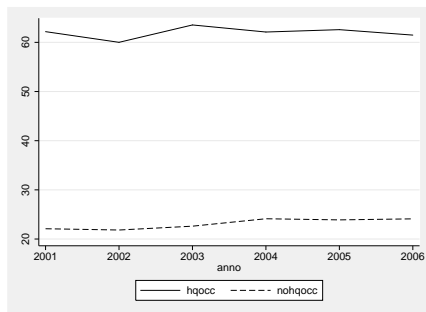
**FDI firms: firms producing abroad with own affiliates in 2000-06.**

## Multi-area FDI firms: employment



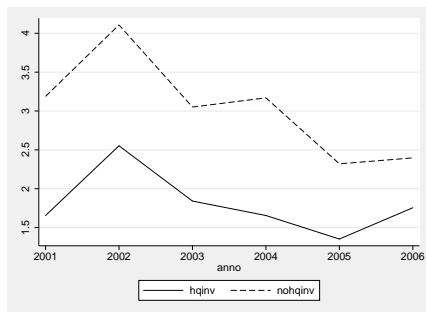
- Among multi-area FDI firms, employment in non-HQ plants (nohqocc) declines much faster than employment in HQ plants (hqocc)

## Multi-area non-FDI firms: employment



- Among multi-area non-FDI firms, the employment path in non-HQ plants (nohqocc) and in HQ plants (hqocc) is similar

## Multi-area FDI firms: investments



- Among multi-area FDI firms, investments in non-HQ plants (nohqinv) decline much faster than investments in HQ plants (hqinv)

# Econometric set-up

- Sample: multi-area firms (FDI and non-FDI)
- Dependent variable: annual growth rate of employment in firm  $i$  and area  $j$

$$\Delta \ln l_{i,j,t} = b_0 + b_1 nohq_{i,j} + b_2 fdi_{i,j} + b_3 nohq_{i,j} * fdi_{i,j} + Z_{i,j,t} + \epsilon_t$$

- 1  $nohq$  is a dummy: 1 if non-HQ plants, 0 if HQ plants
  - 2  $fdi$  is a dummy: 1 if firm produced abroad with own foreign affiliates in 2000-06
  - 3  $nohq * fdi$  is the interaction between  $fdi$  and  $nohq$
  - 4  $Z$  includes log level of employment, year, industry and area fixed effects, M&As dummies, group
- By analysing  $b_1 + b_3$  we compare the performance of the two groups  $nohq=1$  and  $fdi=1$  versus  $nohq=0$  and  $fdi=1$

# Econometric issues

- Standard error bias with aggregate observations (Moulton 1990): firm-level clustered standard errors
- Estimate coefficient representative of population effect: weighted OLS (firm-area employment level as weight)
- Broader definition of FDI, including foreign outsourcing:  $fdi(broad)$
- Closure (or opening) of all plants in a given area: estimates with absolute employment growth as dependent variable

# Employment: baseline results

Dependent var.:	$\Delta_{t-1} \log(\text{Empl})$		$\Delta_{t-1} (\text{Empl})$	
	(1)	(2)	(3)	(4)
nohq	-.027 (.025)	-.021 (.026)	-.013** (.005)	-.013** (.006)
fdi	.022 (.016)	-	.027** (.013)	-
fdi(broad)	-	.022 (.016)	-	.025** (.010)
nohq*fdi	-.018 (.029)	-	-.028** (.013)	-
nohq*fdi(broad)	-	-.025 (.030)	-	-.024** (.011)
Tests of joint significance: nohq+nohq*fdi=0				
	$F = 3.58$ p-value=0.06	$F = 4.01$ p-value=0.05	$F = 9.78$ p-value=0.00	$F = 10.93$ p-value=0.00
Observations	2,900	2,900	3,281	3,281
R <sup>2</sup>	.202	.202	.174	.174

# Robustness

- Controls for R&D, skilled workers ratio, wage growth rate
- Different weighting schemes: no weight, survey weight
- Select sample of FDI firms, estimate:

$$\Delta \ln l_{i,j,t} = b_0 + b_1 nohq_{i,j} + Z_{i,j,t} + \epsilon_t$$

- Employment levels are serially correlated, estimate:

$$\ln l_{i,j,t} = b_0 + b_1 nohq_{i,j} + b_2 fdi_{i,j} + b_3 nohq_{i,j} * fdi_{i,j} + b_4 \ln l_{i,j,t-1} + Z_{i,j,t} + \epsilon_t$$

- Three alternative techniques:
  - 1 Random effects at firm-area level
  - 2 Fixed effects at firm-level (only for FDI firms)
  - 3 System-GMM estimation

# Employment: alternative methods

Dependent var.: $\log(\text{Empl})_t$				
	OLS (1)	random effects (2)	fixed effects (3)	gmm-sys (4)
$\log(\text{Empl})_{t-1}$	0.968*** (0.006)	0.959*** (0.007)	0.930*** (0.019)	0.878*** (0.045)
nohq	-0.030* (0.018)	-0.050*** (0.019)	-0.169*** (0.044)	-0.221** (0.099)
fdi	0.032* (0.016)	0.039** (0.017)	-	0.081** (0.037)
nohq*fdi	-0.048** (0.024)	-0.049** (0.025)	-	-0.029 (0.035)
Tests of joint significance: $\text{nohq} + \text{nohq} * \text{fdi} = 0$				
	$F = 12.12$ p-value=0.00	$X^2 = 16.26$ p-value=0.00	$F = 14.39$ p-value=0.00	$F = 7.88$ p-value=0.00
Observations	2,915	2,915	940	2,915
R <sup>2</sup>	0.975		0.978	

# Investments: baseline results

Dependent var.:	$\Delta_{t-1} \log(\text{Investments})$		$\Delta_{t-1} (\text{Investments})$	
	(1)	(2)	(3)	(4)
nohq	-.201*** (.068)	-.203*** (.074)	-1.614** (.632)	-1.708** (.706)
fdi	.032 (.079)	-	4.539 (4.557)	-
fdi(broad)	-	.017 (.077)	-	3.788 (3.731)
nohq*fdi	-.005 (.094)		-.819 (2.060)	
nohq*fdi(broad)	-	-.00005 (.095)	-	-.354 (1.525)
Tests of joint significance: nohq+nohq*fdi=0				
	$F = 14.29$ p-value=0.00	$F = 16.1$ p-value=0.00	$F = 0.95$ p-value=0.33	$F = 1.06$ p-value=0.30
Observations	2,073	2,073	3,261	3,261
R <sup>2</sup>	.155	.155	.103	.102

# Recap and discussion

- Home-country effects of FDI: this paper looks at what happens *inside* multi-plant FDI firms
- Aggregate relevance, uneven geographical distribution, less selection bias
- Evidence that employment growth rate is significantly worse in non-HQ plants relatively to HQ plants, esp. in FDI firms
- Consistent with models of vertical and horizontal FDI, but also with political and social pressures
- *The 'victims' are far away - both spatially and emotionally* (Boddewyn 1993)
- Further work needed to disentangle between potential explanations