

Multinationals and the Globalization of Production

FDI and the host country

Penn State // Fall 2016

Administrative things

- ▶ Arkaive.com course code: 3D0Y
 - ▶ Please sign in
- ▶ Problem set #3
 - ▶ Solutions posted online
 - ▶ Graded problem sets on Tuesday

Roadmap

- ▶ Past: Motives for firms to produce abroad
 - ▶ Horizontal reasons (market access)
 - ▶ Vertical reasons (factor cost differences)
 - ▶ Some mixture of the two
 - ▶ Focused on the firm

- ▶ Up next: The impact of FDI on the host country
 - ▶ How are local firms affected?
 - ▶ Should governments encourage inward FDI?

- ▶ Today: Focus on productivity in host country

Productivity

- ▶ How well a firm changes inputs into outputs
- ▶ More productive firms produce more output per unit of inputs

- ▶ Why do we care about productivity?
 - ▶ High productivity generates “rich” countries
 - ▶ The Solow growth model shows us this

- ▶ MNEs are big and productive

- ▶ How do they affect productivity in the host country?

Productivity

- ▶ Cobb-Douglas production function for plant i

$$y_i = \varphi_i k_i^\alpha \ell_i^{1-\alpha}$$

- ▶ y = output; k = physical capital; ℓ = labor; α = parameter
- ▶ φ = total factor productivity (TFP)
- ▶ With data on y , k , ℓ , and α , compute productivity

$$\varphi_i = \frac{y_i}{k_i^\alpha \ell_i^{1-\alpha}}$$

Productivity

- ▶ Total factor productivity best (not perfect) measure
 - ▶ Capital can be difficult to measure
- ▶ Other measures [easier to find data]
 - ▶ Real value added per worker
 - ▶ Real sales per worker

Average productivity

- ▶ How productive is a country?
- ▶ How productive is an industry?
- ▶ Often asked by policy makers:
 - ▶ How will policy X affect productivity in my country/industry?
- ▶ These are statements about the average productivity in a country/industry

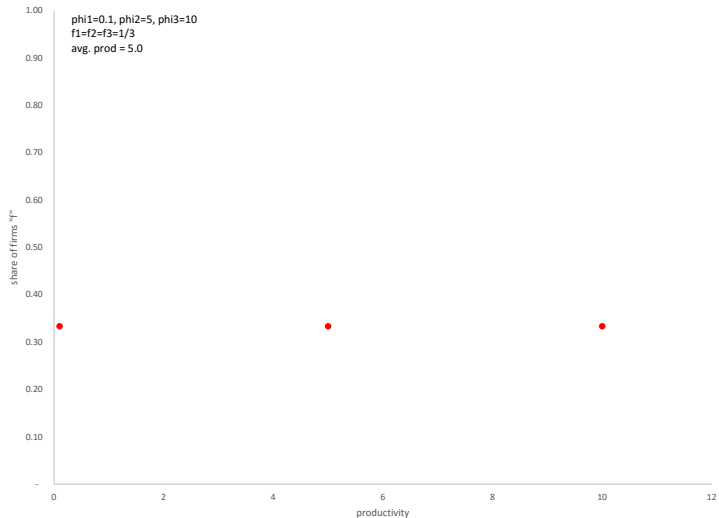
- ▶ How do we measure average productivity?

Computing average productivity

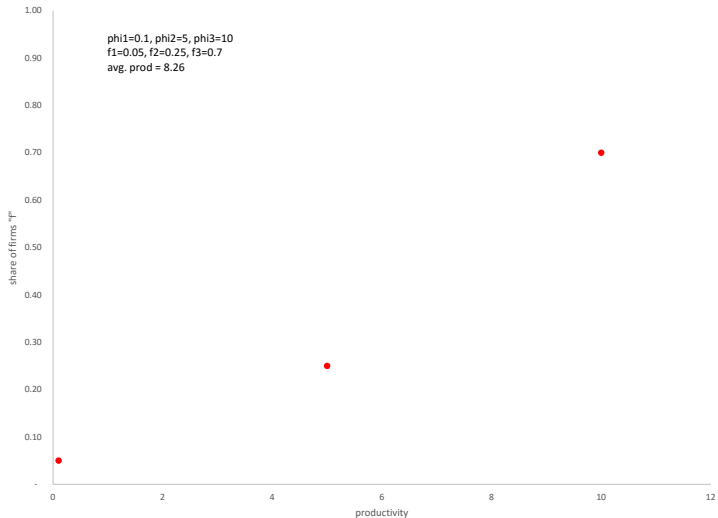
- ▶ Suppose we have three types of firms
 - ▶ High productivity, medium productivity, low productivity
 - ▶ $\varphi_3 > \varphi_2 > \varphi_1$
- ▶ Distribution over the three types
 - ▶ f_3 = share of all firms of type 3
 - ▶ f_2 = share of all firms of type 2
 - ▶ f_1 = share of all firms of type 1
 - ▶ $f_1 + f_2 + f_3 = 1$
- ▶ Average productivity

$$\varphi_{avg} = f_1\varphi_1 + f_2\varphi_2 + f_3\varphi_3$$

Uniform distribution



Fewer low-productivity firms



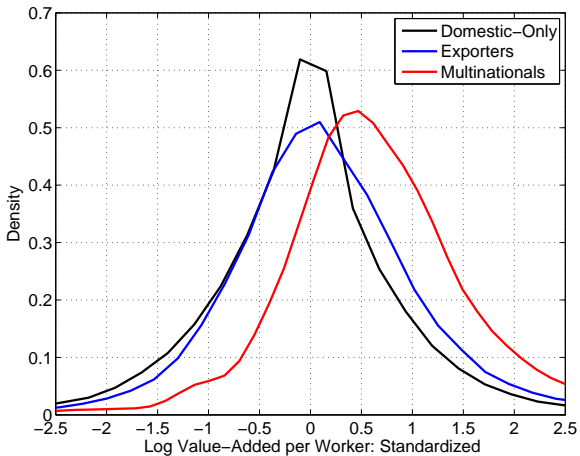
Two kinds of productivity effects

1. Composition effects (changes in f)

2. Spillover effects (changes in φ)

Composition effects

US manufacturing productivity



Source: Flaaen (2014)

Multinational premium

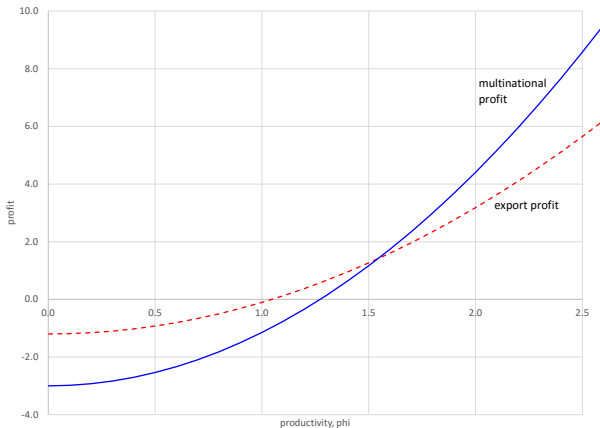
► MNE premium = $\text{avg}(x_{mne}) / \text{avg}(x_{dom})$

Country	MNE premium	Source
Chile	15% (va/worker)	Ramondo (2009)
Morocco	20% (ouput/worker)	Haddad and Harison (1993)
U.K.	6–22% (va/worker)	Griffith (2009)
		Girma, Greenaway, and Wakelin (2001)
U.S.	94% (va/worker)	Doms and Jensen (1998)
U.S.	50% (va/worker)	Flaen (2015)

MNEs are more productive

- ▶ Productivity distribution for MNEs to the “right” of domestic firms
- ▶ There are a greater number of more-productive MNEs
- ▶ Our heterogenous firm model generates this pattern

Profits and productivity



- Which firms export? Which firms become MNEs?

Increasing MNEs in a country

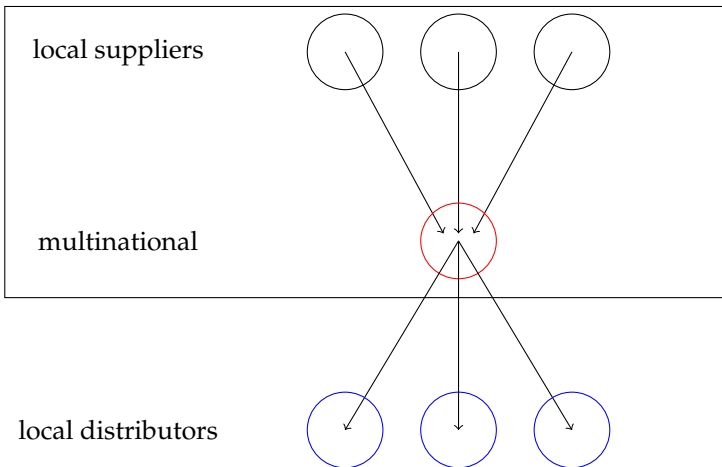
- ▶ Increases share of firms with high productivity
- ▶ Increases competition for local firms
 - ▶ Least efficient firms close
 - ▶ Decrease share of firms with low productivity
- ▶ These effects increase average productivity in the country

Two kinds of productivity effects

1. Composition effects (changes in f)
 - ▶ MNEs more productive than local firms
 - ▶ Increase competition
 - ▶ Change in types of firms in production
 - ▶ Aggregate productivity increases
2. Spillover effects (changes in φ)

Spillover effects

MNE interactions with other firms: flow of goods



Spillovers through backward linkages

- ▶ *Backward link*: Changes in upstream firms from MNE interactions
 - ▶ Change inventory methods
 - ▶ Improve quality for use in MNE
 - ▶ Provide technology or training to upstream firms
- ▶ Could be formal or informal
 - ▶ Formal: License a technology to upstream firm
 - ▶ Informal: Demonstrate new techniques, employment turnover
- ▶ More important when more MNE inputs are from locals

What benefits do MNEs provide?

► Interviews with local Czech firms (25 companies reporting)

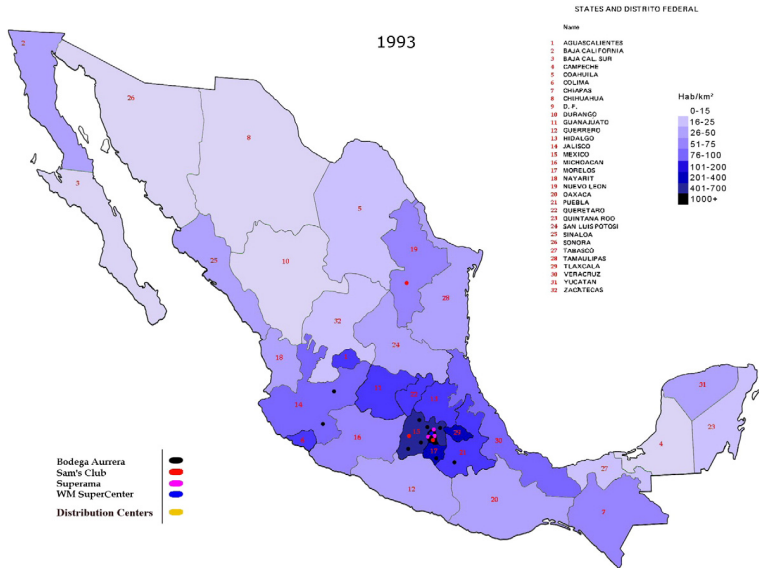
	firms reporting assistance	of which required fee
advance payment & financing	14	2
leasing/lending machinery	7	2
employee training	7	1
quality control	5	1
business strategy	5	0
supplying inputs	2	1
production technology	3	1
organization of production lines	3	1
finding export markets	3	1
license for new technology	2	1
financial planning	2	0
machinery maintenance	2	1
inventory management	1	0

Source: Javorcik and Spatareanu (2009)

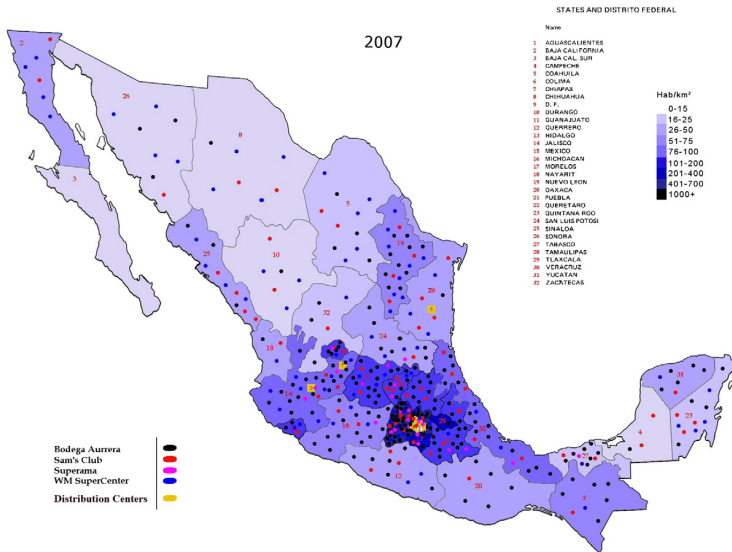
Walmex (Walmart de México)

- ▶ 1991: Walmart enters Mexico through joint venture
- ▶ 1997: Walmart become majority owner
- ▶ 2001: Walmex accounts for half of Mexican retail

Walmex locations 1993



Walmex locations 2007



Source: Iacovone et al. (2015)

Walmex (Walmart de México)

- ▶ 1991: Walmart enters Mexico through joint venture
- ▶ 1997: Walmart become majority owner
- ▶ 2001: Walmex accounts for half of Mexican retail
- ▶ Walmex introduces new technology to Mexico
 - ▶ Improvements in warehousing, distribution
 - ▶ 2007: Walmex only retailer using computerized sales and inventory tracking

- ▶ What is the impact on Mexican suppliers?
- ▶ Iacovone et al. (2015) interviews suppliers

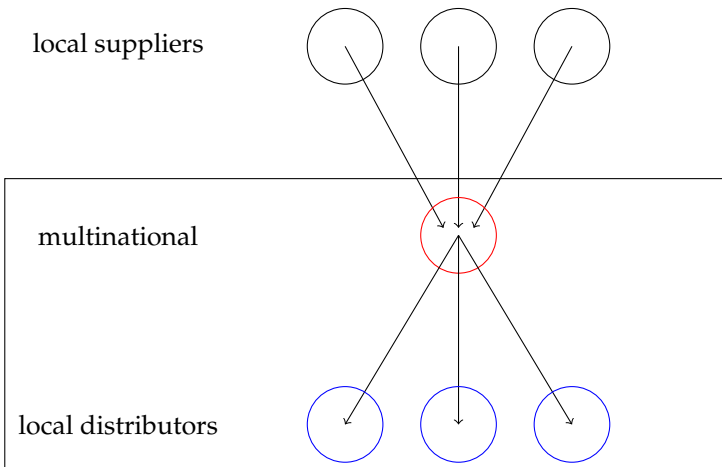
Walmex and backwards linkages

- ▶ Advantages to supplying Walmex
 - ▶ Access to a large market
 - ▶ Walmex pays on time (decrease uncertainty)
 - ▶ Low distribution costs
- ▶ Disadvantages to supplying Walmex
 - ▶ Walmex has large bargaining power
 - ▶ Must make investments in technology to meet Walmex requirements (e.g. packaging technology)
 - ▶ Reduces prices as goods become less popular

Walmex and suppliers

- ▶ How did suppliers respond?
 - ▶ High cost suppliers do not get Walmex distribution; face stiffer competition; some fail
 - ▶ More efficient suppliers get larger market share through Walmex, but must keep up with Walmex price pressure
 - ▶ Increased incentive to innovate both products (new or better kinds of goods) and process (new or better ways of producing)
- ▶ Firms upstream from Walmex improve → backward linkage spillover
- ▶ Retailing and distribution in Mexico are more efficient

MNE interactions with other firms: flow of goods



Spillovers through forward linkages

- ▶ Forward link: Changes in downstream firms from MNE
 - ▶ Create and expand local distributors
 - ▶ Provide better inputs for downstream producers
- ▶ Could be formal or informal
- ▶ More important when MNE sells more in domestic market

- ▶ Almost no evidence that forward linkages are important

Evidence of spillovers in Lithuania

- ▶ Javorcik (2004): Study firm-level data in Lithuania
- ▶ Increase in MNE activity as Lithuania transitions to market economy
- ▶ Look for upstream and downstream spillovers
- ▶ Backward linkage spillovers
 - ▶ Do firms that produce goods used in industries with “many” MNEs have higher productivity?
- ▶ Forward linkage spillovers
 - ▶ Do firms that use goods produced in industries with “many” MNEs have higher productivity?

Evidence of spillovers in Lithuania

- ▶ Find evidence of backward spillovers
- ▶ Find no evidence of forward spillovers
 - ▶ Developing countries more export oriented
- ▶ Backward spillovers are stronger in joint ventures compared to “greenfield investment”
 - ▶ Local partner in joint venture has easier time finding local suppliers [selection vs. spillovers]

Two kinds of productivity effects

1. Composition effects (changes in f)

- ▶ MNEs more productive than local firms
- ▶ Increase competition
- ▶ Change in types of firms in production
- ▶ Aggregate productivity increases

2. Spillover effects (changes in φ)

- ▶ MNEs make local firms more productive
- ▶ Backward linkages with local input suppliers
- ▶ Forward linkages with local distributors

MNEs and host country productivity

- ▶ How does FDI affect the average productivity of the host country?
- ▶ Two channels: composition and spillovers
 - ▶ Composition: More high-productivity firms
 - ▶ Spillovers: Local firms become more productive
- ▶ Composition effects predicted by heterogenous firm models
- ▶ Spillovers
 - ▶ Backward linkages to local suppliers
 - ▶ Forward linkages to local distributors
- ▶ Backward linkages strong, forward linkages weak