

# Multinationals and the Globalization of Production

## *Horizontal FDI: III*

Penn State // Fall 2017

## Administrative things

- ▶ Sign in to Arkaive.com (course code: 84ST)
  - ▶ If not working, sign in up front

FOMC MEETING  
19-20 SEPT

# Roadmap

- ▶ Past: OLI framework
  - ▶ Identify MNE advantage
  - ▶ High-level analysis MNE facts
- ▶ Present: Towards a model of horizontal FDI
  - ▶ Introduce a model of competition
  - ▶ The closed economy
  - ▶ Open economy with exporters and MNEs
  - ▶ Formalize the proximity-concentration tradeoff

## Exporters

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- ▶ Pay export fixed costs  $f^e$  and trade cost  $\tau$
- ▶ How much extra profit does the firm earn from exporting?

$$p_e = \frac{w_1}{\varphi} \frac{\epsilon_2}{\epsilon_2 - 1} (1 + \tau)$$

$$\Delta\pi_1^e(\varphi) = \frac{1}{\epsilon_2} \left( \frac{\epsilon_2}{\epsilon_2 - 1} \frac{w_1}{\varphi} (1 + \tau) \right)^{1 - \epsilon_2} E_2 - w_1 f^e$$

## Multinational firms

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- ▶ Pay production fixed cost  $f^p$  abroad; avoid  $\tau$  and  $f^e$
- ▶ How much profit does the firm earn from affiliate sales?

$$p_m = \frac{w_2}{\varphi} \frac{\epsilon_2}{\epsilon_2 - 1}$$

$$\Delta\pi_1^m(\varphi) = \frac{1}{\epsilon_2} \left( \frac{\epsilon_2}{\epsilon_2 - 1} \frac{w_2}{\varphi} \right)^{1-\epsilon_2} E_2 - w_2 f^p$$

## When does a firm choose FDI over exporting?

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- ▶ A country-1 firm serves country 2 by FDI when

$$\Delta\pi_1^m(\varphi) > \Delta\pi_1^e(\varphi)$$


$$\Delta\pi_1^m(\varphi) - \Delta\pi_1^e(\varphi) > 0$$

- ▶ Substitute definitions...

$$\frac{1}{\epsilon_2} \left( \frac{\epsilon_2}{\epsilon_2 - 1} \frac{w_2}{\varphi} \right)^{1-\epsilon_2} E_2 - w_2 f^p > \frac{1}{\epsilon_2} \left( \frac{\epsilon_2}{\epsilon_2 - 1} \frac{w_1}{\varphi} (1 + \tau) \right)^{1-\epsilon_2} E_2 - w_1 f^e$$

## A second look at proximity and concentration

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- ▶ Last class:
  - ▶ Effect of  $\tau$ ,  $E_2$ , and  $f^p$  on a particular firm's ( $\varphi$ ) decision
  - ▶ We were holding  $\varphi$  fixed 
  
- ▶ Today:
  - ▶ How do  $\tau$ ,  $E_2$ , and  $f^p$  affect the types of firms in the market?
  - ▶ Compare  $\Delta\pi_1^m(\varphi) - \Delta\pi_1^e(\varphi)$  for different  $\varphi$
  
- ▶ These are related concepts

## A second look at proximity and concentration

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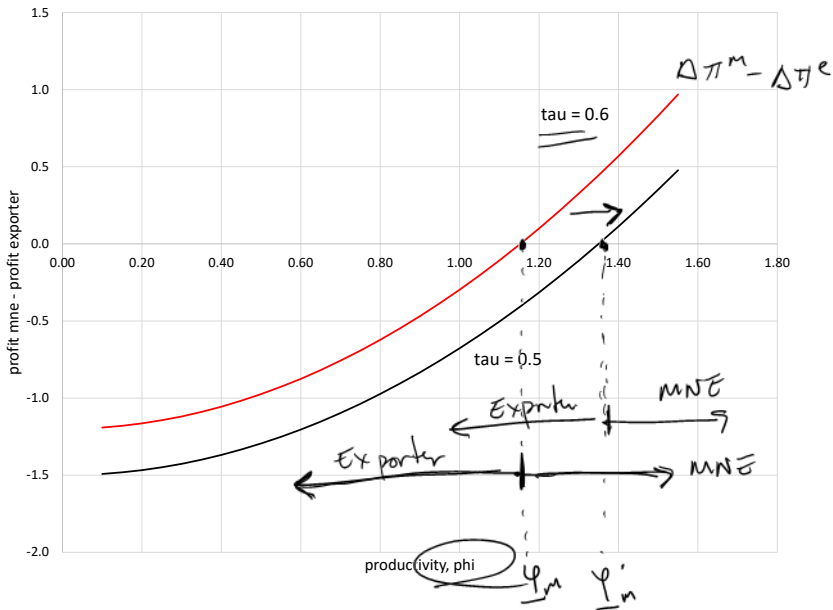
- ▶ As  $\tau$ ,  $E_2$ , and  $f^p$  change, so does the “cutoff firm” type
- ▶ The cutoff firm type is the  $\underline{\varphi}_m$  such that

$$\Delta\pi_1^m(\underline{\varphi}_m) - \Delta\pi_1^e(\underline{\varphi}_m) = 0$$

- ▶ This firm type earns the same profit from exporting as from multinational production



## Decrease variable export costs



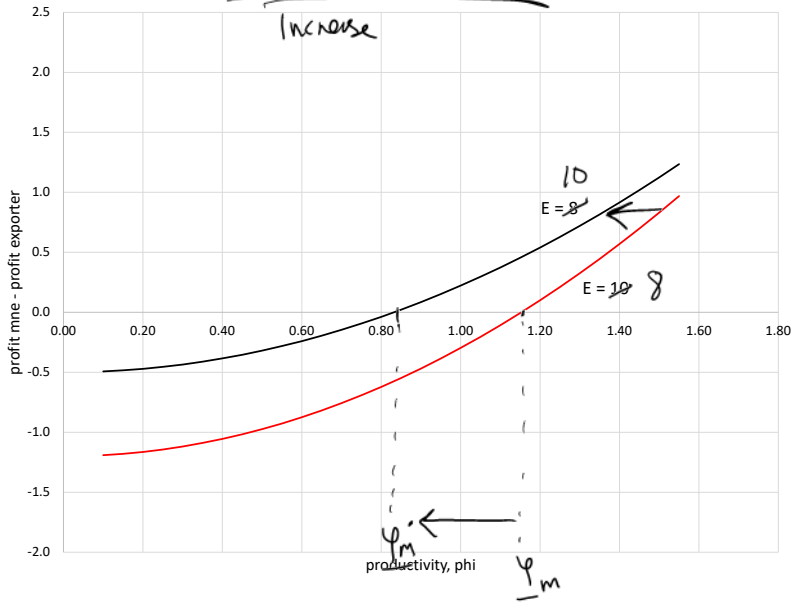
## Variable export costs

- ▶ How does  $\underline{\varphi}_m$  change as  $\tau$  decreases?

$\underline{\varphi}_m \uparrow$  minimum prod needed to  
be MNE increases.

Why? Exporting is more profitable.

Decrease market size



## Market size

- How does  $\varphi_m$  change as  $E_2$  ~~decreases~~<sup>in</sup>?

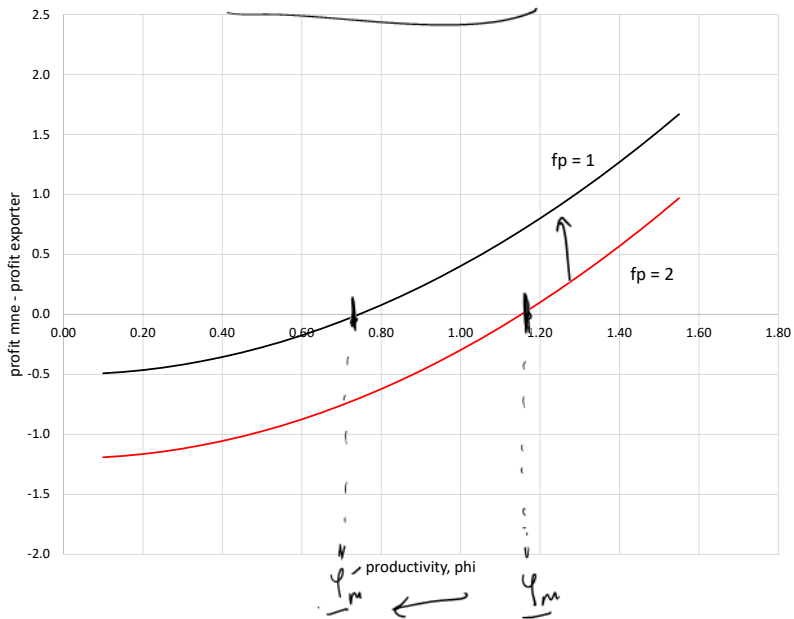
$E_2 \uparrow$  :  $\varphi_m \downarrow$  : less productive firms are  
multinationals

Expect to see more MNEs in  
larger markets.

BRICS

Big = GDP  
Rich = GDP/capita

## Decrease fixed production cost



## Fixed production cost

- ▶ How does  $\varphi_m$  change as  $f^p$  decreases?

$f^p \downarrow : \varphi_m$  less productive firms can now be MNEs.

## Finding the cutoff multinational

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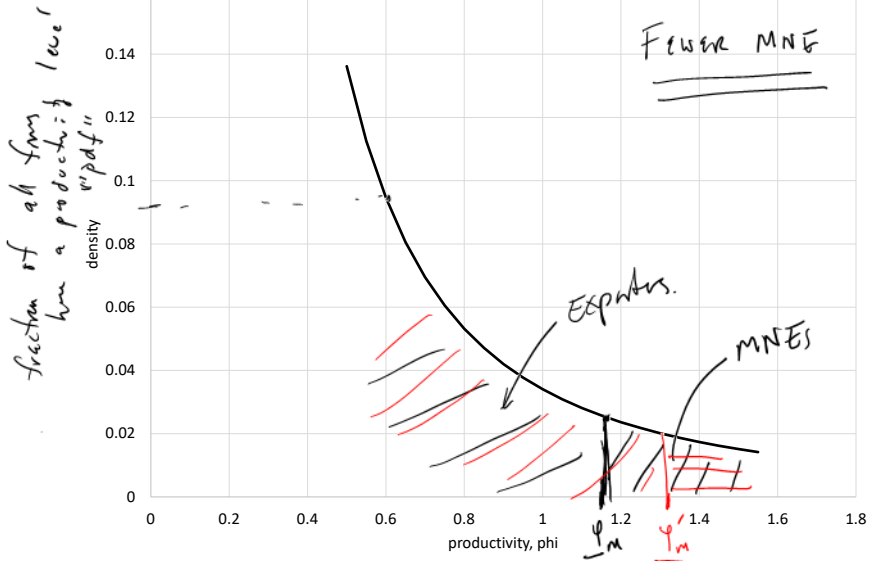
- Solve for  $\underline{\varphi}_m$

$$\Delta\pi_1^m(\underline{\varphi}_m) - \Delta\pi_1^e(\underline{\varphi}_m) = 0$$

$$\frac{1}{\epsilon_2} \left( \frac{\epsilon_2}{\epsilon_2 - 1} \frac{w_2}{\underline{\varphi}_m} \right)^{1-\epsilon_2} E_2 - w_2 f^p - \frac{1}{\epsilon_2} \left( \frac{\epsilon_2}{\epsilon_2 - 1} \frac{w_1}{\underline{\varphi}_m} (1 + \tau) \right)^{1-\epsilon_2} E_2 + w_1 f^e = 0$$

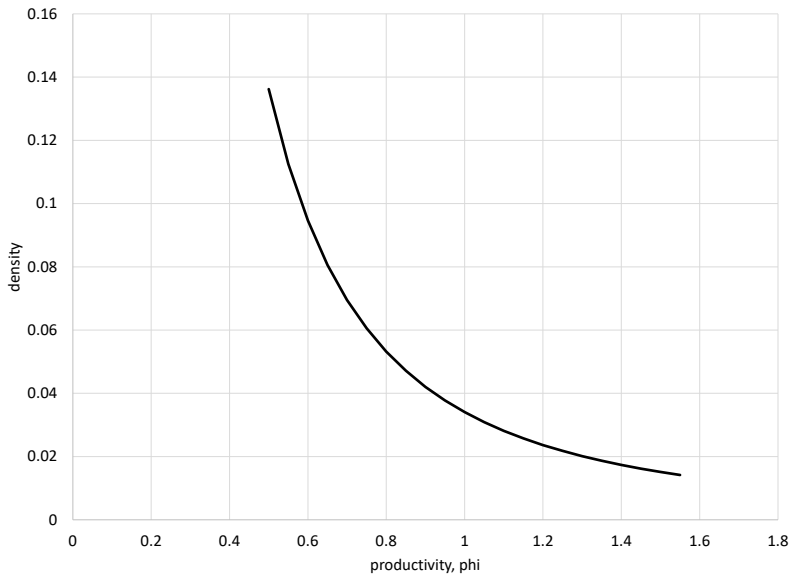
- .....let's save this for problem set #2

## Decrease variable export costs

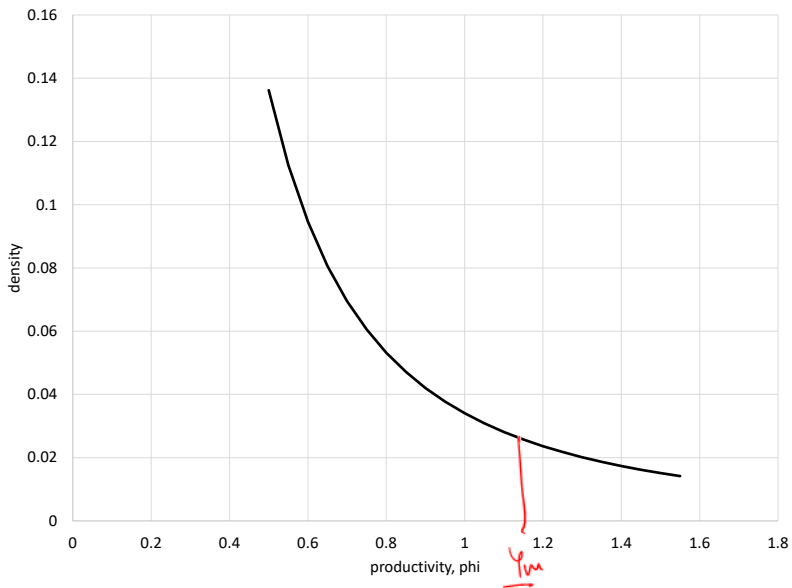




## Decrease market size



## Decrease production fixed cost



## The proximity-concentration tradeoff

Let's summarize all this!

## The proximity-concentration tradeoff II

- We should observe more firms serving a foreign market as multinationals, rather than as exporters when

1. the foreign market is larger (larger  $E_2$ )
2. variable export costs are larger (larger  $\tau$ )
3. production fixed costs are smaller (smaller  $w_2 f^p$ )

6 firms:  
1. monitoring

- Compare this to our previous proximity-concentration tradeoff

where would I expect to see more MNEs?

NEW ZEALAND

-

+

- (?)

-

market size

trans costs

prod. fixed costs

labor costs

MEXICO

+

-

+

+

## The proximity-concentration tradeoff I

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- ▶ From last week...
- ▶ For a given  $\varphi$ , a firm is more likely to use a foreign affiliate to serve the foreign market, rather than exporting, when
  1. the foreign market is larger (larger  $E_2$ )
  2. variable export costs are larger (larger  $\tau$ )
  3. production fixed costs are smaller (smaller  $w_2 f^p$ )

## Comparing the two

- ▶ PCT I tells us what firm types are likely to be MNEs compared to exporters
  - ▶ This helps us understand facts about multinational firms relative to non-multinational firms

## Fact #4: How do MNEs compare to domestic firms?

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Both the parents and the affiliates of multinational firms tend to be larger, more productive, more R&D intensive and more export oriented than non-multinational firms.

## Comparing the two

- ▶ PCT I tells us what firm types are likely to be MNEs compared to exporters
  - ▶ This helps us understand facts about multinational firms relative to non-multinational firms
  
- ▶ PCT II tells us how important MNEs are in serving different kinds of countries
  - ▶ This helps us understand facts about where MNEs operate



## Fact #1: Where do MNEs operate?

Multinational activity is primarily concentrated in developed countries where it is mostly two-way. Developing countries are more likely to be the destination of multinational activity than the source.

### Fact #3: How far do MNEs go?

The production of the foreign affiliates of multinationals falls off in distance, but at a slower rate than aggregate exports.