Recent Advances in the Field of Trade Theory and Policy Analysis Using Micro-Level Data

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Content

a) Stylized facts about firms in international trade

b) The heterogeneous firms model of international trade

c) (Additional) empirical evidence

d) Implications of the new-new theory for normative and positive trade policy analysis

a) Stylized facts about firms in international trade

- Firms are heterogeneous
- Only few firms export
- Exporting is concentrated
- Exporters are different
- Most productive firms self-select into exporting
- Trade liberalization raises industry productivity
- Evidence on importing firms

Firms are heterogeneous

- Across all the US plants in 1992:

    1. A plant one standard deviation above the mean size is 167% bigger than the average
    2. A plant one standard deviation above the mean plant productivity level is 75% more productive (Bernard et al., 2003)

Firms are heterogeneous (ct'd)

- The distribution of firms size is dispersed, even within sectors (evidence of heterogeneity across firms)

Table 1: Heterogeneity of firms (standard deviation of log sales)

Country	Producers	Overall	Within sector
France	76,456	1.82	1.7
Italy	39,704	1.33	1.29
Spain	31,446	1.26	1.18
US (plants)	224,009	1.67	-

Only few firms export

Table 2: Share of exporters in total number of manufacturing firms

	Year	Share of exporters in total number of manufacturing firms
United States	2002	18.0
Norway	2003	39.2
France	1986	17.4
Japan	2000	20.0
Chile	1999	20.9
Colombia	1990	18.2
Indonesia	1991-2000	19.0

Sources: WTO (2008, Table 5); Amiti and Cameron (2012) for IDN

Only few firms export (ct'd): Heterogeneity across sectors

Table 3: Heterogeneity of US firms (Bernard et al. 2007)

Sector	Per cent of firms	Per cent of Firms that export	Mean Exports as a per cent of total shipments
Food manufacturing	6.8	12	15
Beverage and tobacco products	0.7	23	7
Textile mills	1	25	13
Textile product mills	1.9	12	12
Apparel manufacturing	3.2	8	14
Leather and allied product	0.4	24	13
Wood product manufacturing	5.5	8	19
Paper manufacturing	1.4	24	9
Printing and related support	11.9	5	14
Petroleum and coal products	0.4	18	12
Chemical manufacturing	3.1	36	14
Plastics and rubber products	4.4	28	10
Nonmetallic mineral products	4	9	12
Primary metal manufacturing	1.5	30	10
Fabricated metal product	19.9	14	12
Machinery manufacturing	9	33	16
Computer and electronic product	4.5	38	21
Electrical equipment	1.7	38	13
Transportation equipment	3.4	28	13
Furniture and related product	6.4	7	10
Miscellaneous manufacturing	9.1	2	15
Aggregate Manufacturing	***100***	***18***	***14***

Only few firms export (ct'd)

- Exporting firms ship a small share of their total shipments abroad
  - In the US, the average is 14% (see Table 3)
  - The shares range from 21% in computer sector to 7% in beverages
  - In the EU, the *intensive margin* (share of export value over total turnover) is as follows:

Table 4. Intensive margin of exports in the EU

	Austria	France	Germany	Hungary	Italy	Spain	UK
Intensive margin	40.4	28.5	30.0	44.8	34.6	25.9	29.1

Source: Second EFIGE Report (2011)

Note: Samples of firms (large firms over-represented)

Exporting is concentrated

- "Superstar exporters": aggregate exports are driven by a small number of top exporters

Table 5. Per cent of exports accounted for by largest exporters

	Year	Top 1%	Top 5%	Top 10%
United States	2002	80.9	93	96.3
Belgium	2003	48	73	84
France	2003	44	73	84
Germany	2003	59	81	90
Hungary	2003	77	91	96
Italy	2003	32	59	72
Norway	2003	53	81	91
UK	2003	42	69	80
Chile	1999	49.1	82.2	96.4

Source: WTO (2008, Table 6)

Exporting is concentrated (ct'd)

- The share of exporters increases with firm size: in EU countries, the difference in the *extensive margin* (percentage of firms that export a fraction of their sales) between the group of firms with 10-19 employees and the group of firms with at least 250 employees is above 25%

Table 6. Extensive margin of exports, by country and firms size

Size Class	AUT	FRA	GER	HUN	ITA	SPA	UK
10-19	69.8	44.7	45.7	58.9	65.4	51.2	54.9
20-49	63.8	59.1	65.4	64.7	73.3	63.5	62.8
50-249	88.6	75.4	78.2	79.3	86.6	76.2	76.8
> 249	90.8	87.6	84.0	97.4	92.6	88.0	80.7
Total	**72.6**	**57.9**	**63.4**	**67.3**	**72.2**	**61.1**	**64.0**

Source: Second EFIGE Report (2011)

Exporting is concentrated (ct'd)

- The higher the size class the higher the intensive margin (although differences across site classes are less pronounced than for the extensive margin)
  - This is an expected result. Models with fixed costs of entering the export markets predict that firm characteristics impact the probability of exporting, but, conditional on being an exporter, not the share of export over total sales (Melitz, 2003)

Table 7. Intensive margin of exports, by country and firms size

Size Class	AUT	FRA	GER	HUN	ITA	SPA	UK
10-19	26.2	23.0	25.9	30.2	30.4	21.4	26.2
20-49	33.3	27.0	28.1	43.6	34.2	24.5	27.8
50-249	55.9	33.0	33.9	53.2	42.2	33.3	33.2
> 249	64.7	41.2	37.8	66.6	52.6	40.6	34.2
Total	**40.4**	**28.5**	**30.0**	**44.8**	**34.6**	**25.9**	**29.1**

Source: Second EFIGE Report (2011)

Exporters are different

- Firms that export look very different from non-exporters. US Exporters:
  - are larger by 97% for log employment and 108% for shipments
  - are more productive by 11% for log value added and 3% for log TFP
  - pay higher log wages by 6%
  - own more physical and human capital

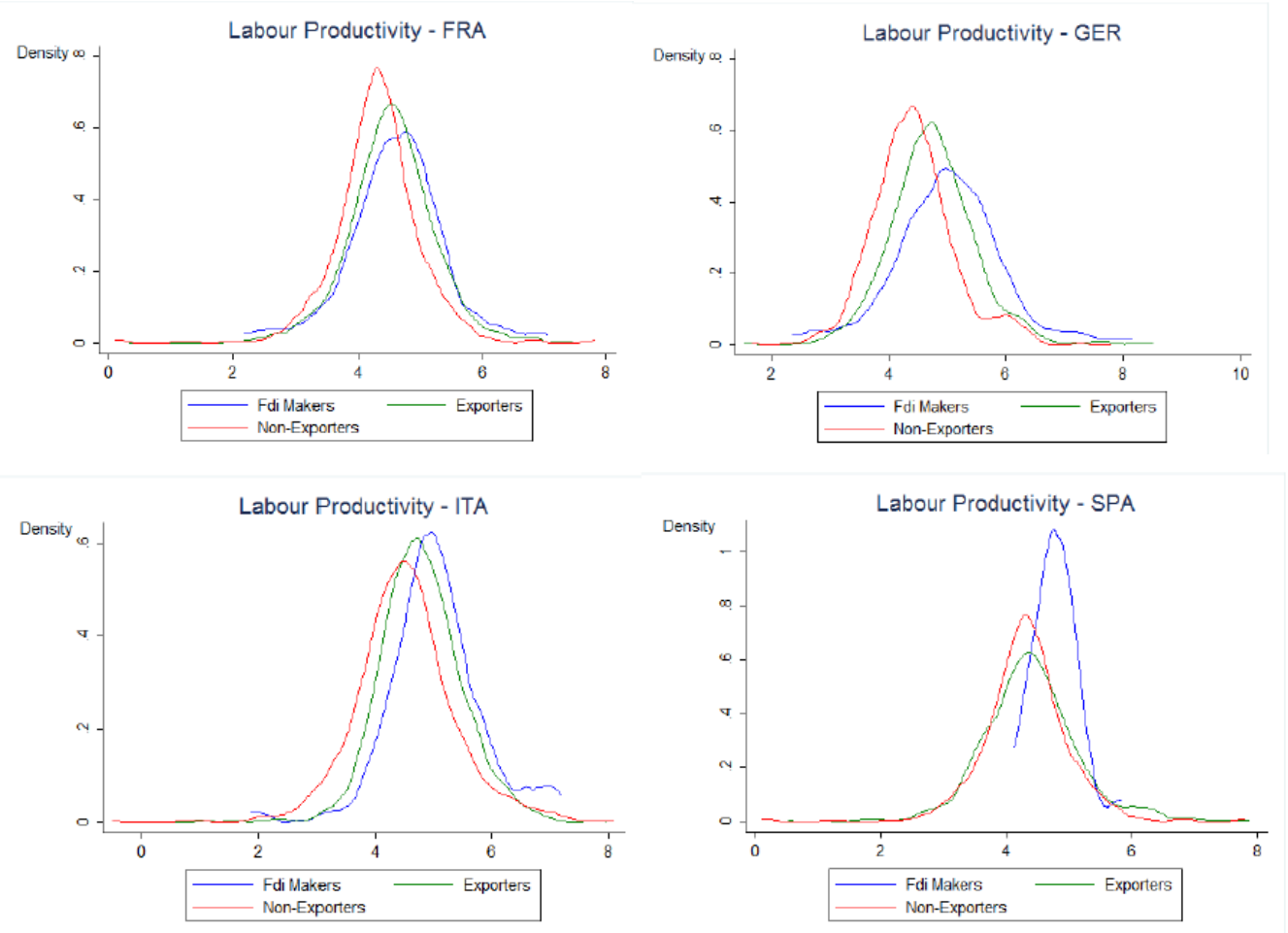
Table 8. Exporter premia in US manufacturing (source: Bernard et al. 2007)

	(1)	(2)	(3)
Log employment	1.19	0.97	
Log shipment	1.48	1.08	0.08
Log VA per worker	0.26	0.11	0.1
Log TFP	0.02	0.03	0.05
Log wage	0.17	0.06	0.06
Log capital per worker	0.32	0.12	0.04
Log skill per worker	0.19	0.11	0.19
Additional covariates	None	Industry f.e.	Industry f.e. and log employment

Exporters are different (ct'd)

- Among EU countries, exporters have higher labour productivity than non-exporting firms

Table 9. Exporter premia in European firms, 2008 (Source: Second EFIGE Report, 2011)



Exporters are different (ct'd)

- Among EU countries, the higher the size class the higher complexity of exporting activity (given by the number of destination markets)

Table 10. Exports complexity by country and size class

Size Class	AUT	FRA	GER	HUN	ITA	SPA	UK
10-19	5	7	7	3	8	5	9
20-49	8	9	12	4	10	8	12
50-249	18	14	18	6	17	12	18
> 249	32	24	28	14	29	23	27
Total	**12**	**11**	**14**	**5**	**11**	**8**	**13**

Source: Second EFIGE Report (2011)

Most productive firms self-select into exporting

- The finding that exporters are systematically more productive than non-exporters raises the question of whether exporting causes productivity growth through some form of "learning by exporting"

- A lot of studies across industries and countries confirm that high productivity precedes entry into export markets. This indicates the presence of sunk costs

- Moreover some other studies find little or no evidence of improved productivity as a result of beginning to export (Bernard and Jensen 1999; Clerides et al. 1998)

- However, there is abundant evidence of the fact that firms entering export market grow faster in terms of employment and output than non-exporters

Trade liberalization raises industry productivity

- Given that exporters are more productive than non-exporters and that exporters grow faster than non-exporters, trade liberalization has an important role in enhancing aggregate productivity through reallocation across firms
  - Aggregate productivity growth is driven by the contraction and exit of low-productive firms and by the expansion and entry into export markets of high-productivity firms
  - This reallocation of resources from low to high productive plants raises average productivity level

- Pavcnik (2002) finds that two-third of the 19% increase in aggregate productivity following Chile's trade liberalization of the late 1970's and early 1980's was due to the relatively greater survival and growth of high-productivity plants

- This evidence has been shown for both developing and developed countries

Trade liberalization raises industry productivity (ct'd)

- The increase in average productivity after trade liberalization is also due to the within-plant productivity gains from the reallocation of resources across activities within plants (Pavcnik 2002)

- Trefler (2004) finds that Canada-US Free Trade Agreement raised labour productivity of Canadian firms by 7.4% or by an annual compound growth rate of 0.93%

- Bernard et al. (2006) find that a one standard deviation reduction in industry-level trade costs (i.e. trade liberalization) raises plant-level productivity growth by 2.3%

Evidence on importing firms: Bernard et al. (2011)

- Around 41 per cent of US exporters also import while 79 per cent of importers also export
- Importers are bigger, more productive, pay higher wages and are more skill- and capital-intensive than non-importers
- Firms which both import and export exhibit the largest performance differences compared to domestic firms
- Recent evidence suggests that reductions in tariffs on imported intermediate inputs may be a prominent source of productivity gains
  - Amiti and Konings (2007)

What we learned

- Strong differences among firms (heterogeneity) in terms of size, productivity, etc. Their different performances suggest:

- Inappropriateness of traditional trade models which consider the "representative" firm

- The need for new trade models having the single firm as the central individual of analysis and which consider this heterogeneity among firms

b) The heterogeneous firms model of international trade

Melitz (2003)

- Motivations
- Assumptions
- Equilibrium in closed economy
- Equilibrium in open economy
- Testable implications
- Empirical evidence

Motivations

- Until the 1980s, the "old" trade theory did not consider intra-industry trade for simplicity, but strong empirical evidence showed that a big share of world trade is intra-industry (Grubel and Lloyd 1975)

- The "new" trade theory, by including imperfect competition and increasing return to scale, predicts intra-industry trade (Krugman 1979)

- But the "new" trade models do not consider firms differences within sectors that we showed in the former lecture to be large

- Melitz (2003) is the first attempt to consider firms differences (in productivity levels) in a model of international trade. This new class of models add:

    - Heterogeneity with respect to firm's marginal costs
    - Fixed entry costs for each market (to be added to the fixed cost for developing a new variety)

Motivations (ct'd)

- The Melitz model is a dynamic model with heterogeneous firms where opening to trade leads to:
  - No change in firm productivity
  - Reallocation of resources within an industry
  - Low productivity firms exit
  - High productivity firms expand so there is a change in industry composition
  - High productivity firms enter the export market

Assumptions

- Single factor: labor with wage normalized to one
- Factor price equalization works in equalizing w and w* → w=w*=1 → firms heterogeneity is given by productivity φ
- There are fixed costs f of producing horizontally differentiated varieties (that give rise to monopolistic competition)
- Moreover, firms pay fixed market entry costs:
  - f_e to enter the domestic market
  - f_x to enter a foreign market
- The fixed cost of entering the domestic market (f_e) is best understood as the cost of participating to a lottery, extracting a productivity level φ
- All firms face the same fixed costs but have different productivity levels

Demand side

- Consumer side of the economy follows the traditional Dixit-Stiglitz structure
- Preferences: $U = \left[\int_{k \in \Omega} q(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right]^{\frac{\sigma}{\sigma-1}}$
- Where q(ω) is the quantity consumed of variety ω and σ>1 is the elasticity of substitution among varieties (people love varieties)
- Consumers love varieties which have a certain degree of substitutability among themselves
- Price Index $P = \left[\int_{k \in \Omega} p(\omega)^{1-\sigma} d\omega \right]^{\frac{1}{1-\sigma}}$ where p(ω) is the price of variety ω

Supply side

- Continuum of firms producing a different variety ω (monopolistic competition)

- Total cost of production (i.e. total labor requirement) is given by the fixed cost for producing a certain variety (f) plus the labor requirement for each product multiplied by the total production level (q(ω)):

$$TC = f + \frac{q(\omega)}{\varphi(\omega)}$$

- Pricing rule: $p(\varphi) = \frac{mc}{\rho\varphi}$

- Where 1/ρ=σ/σ-1 is the mark-up; notice that having normalized wages to one, marginal costs *mc* will also be equal to one

Supply side (ct'd)

- Thus the profit maximization function is:

$$\pi(\varphi) = \max_{q(\varphi)} \left\{ p(\varphi)q(\varphi) - \frac{q(\varphi)}{\varphi} - f \right\} \Rightarrow \frac{1}{\sigma} r(\varphi) - f$$

- Where r(φ) is the revenue function

- Intuition: firms differ only in terms of their revealed productivity level that determines how many workers the firm needs to produce one unit of final good → firm's profit function is increasing with its productivity level (which is exogenously drawn)

Aggregation

- At the equilibrium there will be:
  - M firms (and hence M varieties)
  - A distribution μ(φ) of productivity levels

- Thus all firms can be aggregated taking into account the distribution of productivities across firms (as it is the only source of heterogeneity) and creating a weighted average of firm productivity levels:

$$\tilde{\varphi} = \left[\int_0^{\infty} \varphi^{1-\sigma} \mu(\varphi) d\varphi \right]^{\frac{1}{1-\sigma}}$$

Firm entry and exit

- Prior to entry firms are identical
- In order to enter, firms must pay a fixed cost of entry f_e (in units of labor)
- Then firms draw their productivity parameter φ from the cumulative distribution G(φ), with pdf g(φ)
- Given the "revealed" productivity level, firms can exit (if profits are negative, π(φ) < 0) or stay (if profits are non-negative)
- Thus the cut-off productivity level φ* is given by: π(φ*) = 0
- Since all firms with φ < φ* exit the market, the probability of successful entry is $p_{in} = 1 - G(\varphi^*)$
- The distribution of productivities μ(φ) is a truncated distribution:

$$\mu(\varphi) = \begin{cases} \dfrac{g(\varphi)}{1-G(\varphi^*)} & \text{if } \varphi > \varphi^* \\ 0 & \text{otherwise} \end{cases}$$

- And the average productivity is now $\tilde{\varphi}(\varphi^*) = \left[\dfrac{1}{1-G(\varphi^*)} \int_{\varphi^*}^{\infty} \varphi^{\sigma-1} g(\varphi) d\varphi \right]^{\frac{1}{\sigma-1}}$

Zero cut-off profits (ZCP) condition

- At the cut-off level profits are zero, so revenues equal average costs $(1/\sigma)r(\varphi^*) = f$

- Since average profits are defined as:

$$\bar{\pi}(\varphi) = \pi\left(\tilde{\varphi}\left(\varphi^*\right)\right) = \bar{\pi}\left(\varphi^*\right)$$

They can be expressed as function of φ^*:

$$\bar{\pi} = f\left[\left(\frac{\tilde{\varphi}}{\varphi^*}\right)^{\sigma-1} - 1\right] \qquad \text{(ZCP)}$$

- ZCP is decreasing in φ for a large family of distributions $g(\varphi)$

Free-entry (FE) condition

- Probability of sudden death δ
- With probability p_{in}, the firm expects an average profit flow

$$\bar{v} = \int_{t=0}^{\infty} (1-\delta)^t \bar{\pi} = \frac{1}{\delta}\bar{\pi}$$

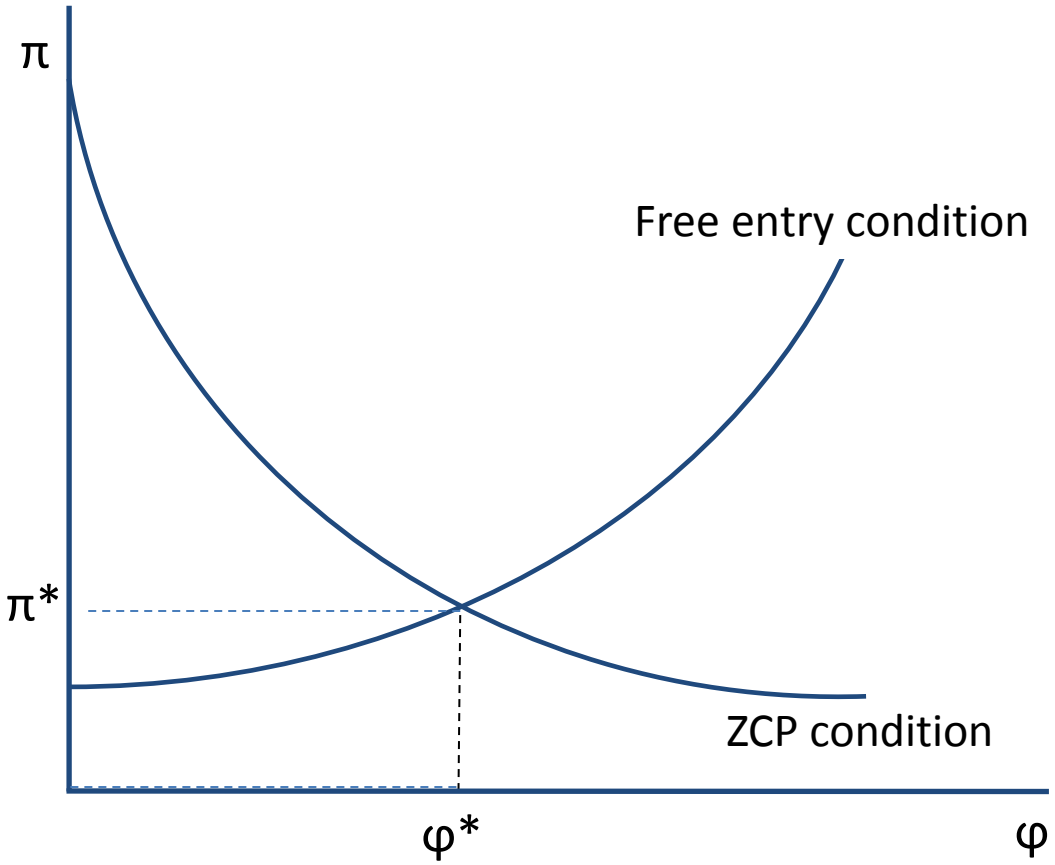
- With free entry, the expected value of future profits $p_{in}\bar{v}$ must be equal to the fixed investment cost (of participating to the productivity lottery) f_e
  - The net value of entry has to be zero

- Free entry condition:

$$\bar{\pi} = \frac{\delta f_e}{1-G(\varphi^*)} \qquad \text{(FE)}$$

- FE is increasing in φ

Closed economy equilibrium



- Free entry and zero cut off profit conditions determine the minimum productivity level observed in the economy (φ*)

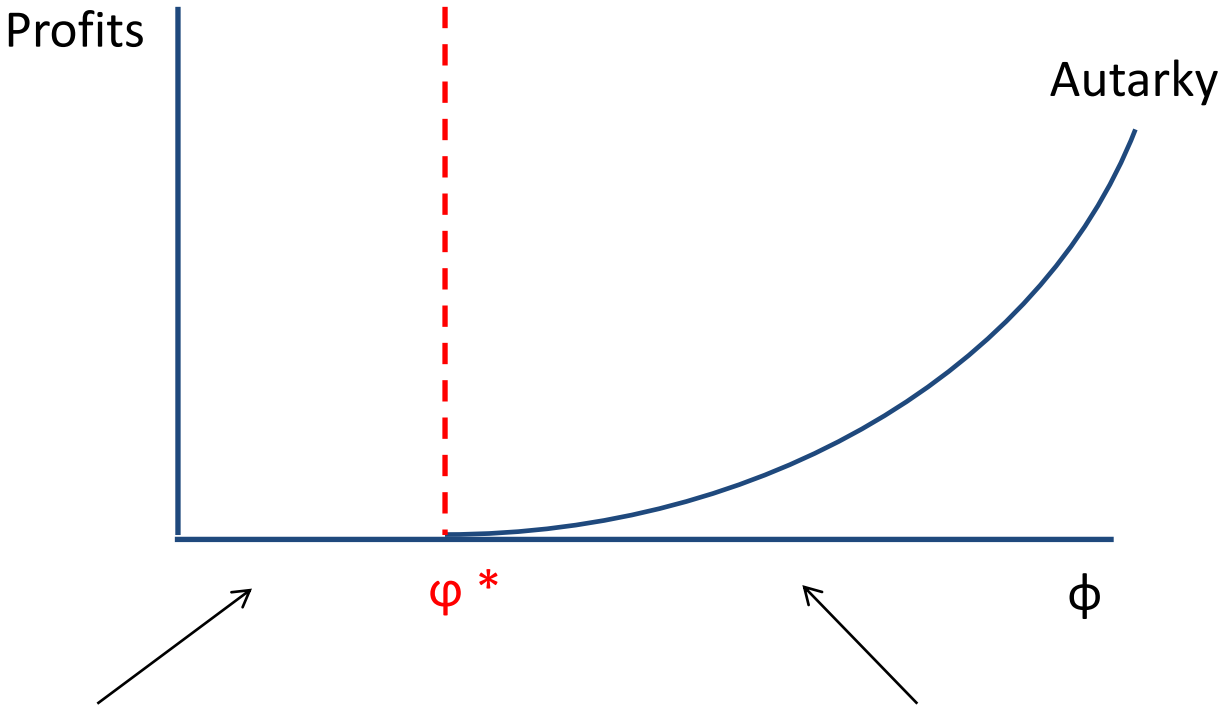
Closed economy equilibrium (ct'd)

- In a stationary equilibrium aggregate variables must remain constant over time

- Number of firms must remain constant over time (i.e. number of new entrants must be equal to the number of exit firms)

- Equilibrium distribution of productivity is not affected by simultaneous entry and exit since all firms have the same distribution of productivity levels

Closed economy equilibrium (ct'd)



Firms with $\varphi < \varphi^*$ do not enter the domestic market

Firms with $\varphi \geq \varphi^*$ enter the domestic market and profits are increasing with productivity levels

Open economy

- Assuming no trade costs, open economy model is a replication of the former outcome with a bigger country
- Assuming some trade costs (not only transportation costs, but also the fixed cost of entry in a new market, f_x) potential exporting firm has to consider such fixed cost in deciding whether enter or not into the foreign market
- Countries are assumed symmetric (wage normalized to one)
- The pricing rule is the same for all firms in domestic and foreign countries
- But exporting firms will set higher prices in foreign market reflecting increased marginal cost due to iceberg cost $\tau \geq 1$

$$p_d(\varphi) = \frac{1}{\rho\varphi} \qquad p_x(\varphi) = \frac{\tau}{\rho\varphi}$$

Revenues and profits in open economy

- Revenues now depend on the export status and (for exporters) on how many foreign markets are served (*n*)

$$r(\varphi)=\begin{cases} r(\varphi)_d & \text{for D - firms} \\ r(\varphi)_d + n r(\varphi)_x = r(\varphi)_d\left[1+n\tau^{1-\sigma}\right] & \text{for } D\text{ - and X - firms} \end{cases}$$

Where n is the number of foreign markets served

- Profits also depend on the export status

$$\pi(\varphi)=\begin{cases} \pi(\varphi)_d & \text{for D - firms} \\ \pi(\varphi)_d + n\pi(\varphi)_x = \pi(\varphi)_d + n\left[\frac{1}{\sigma}\pi(\varphi)_d - f_x\right] & \text{for D - and X - firms} \end{cases}$$

Minimum productivity for exporters

- Exporting firms will always also produce for domestic market

- It follows that the cut-off productivity level for firms to export (φ_x^*) must satisfy the two following conditions:
  1. $\varphi_x^* \geq \varphi^*$

  (this condition is satisfied assuming that $f_x t^{\sigma-1} \geq f$)
  2. Export profits are equal to zero: $\pi_x(\varphi_x^*) = 0$

- Therefore,

$$\varphi^*_x = \inf\left[\varphi : \varphi \geq \varphi^* \text{ and } \pi_x(\varphi) > 0\right]$$

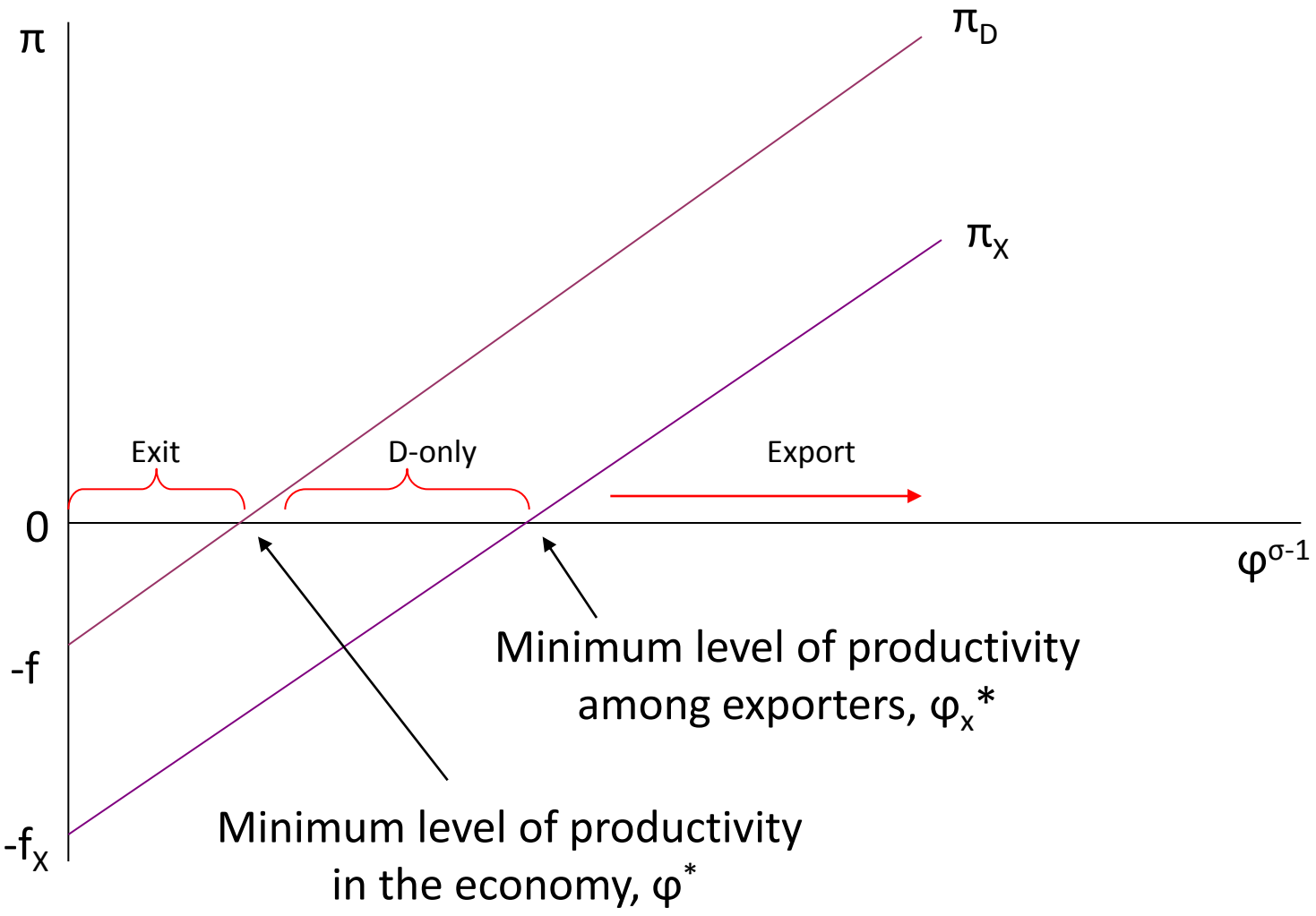
Self-selection (partitioning of firms by productivity)

- If $\varphi^*_x = \varphi^*$ all firms producing at home also export
- If $\varphi^*_x > \varphi^*$ the firms with productivity between φ^*_x and φ^* produce exclusively for the domestic market
- Firms with productivity $\varphi > \varphi^*$ earn positive profits by both exporting and producing domestically
- Notice that the probability of exporting, given successful entry, is:

$$p_x = \frac{1 - G\left(\varphi_x^*\right)}{1 - G\left(\varphi^*\right)}$$

- p_x is also the ex-post fraction of exporting firms

Self-selection (ct'd)



Aggregation in the open economy

- Being p_x the ex-post fraction of exporting firms, the total number of exporting firms is: $M_x=p_xM$

- The total number of available varieties in any country is equal to the total number of competing firms in any country: $M_t=M + nM_x$

- Two average productivity measures until now:
  - Average productivity of all firms $\tilde{\varphi} = \tilde{\varphi}(\varphi^*)$
  - Average productivity of exporting firms $\tilde{\varphi}_x = \tilde{\varphi}(\varphi_x^*)$

- Therefore we can define the weighted productivity average that reflects combined market shares of all firms and the output shrinkage linked to exporting

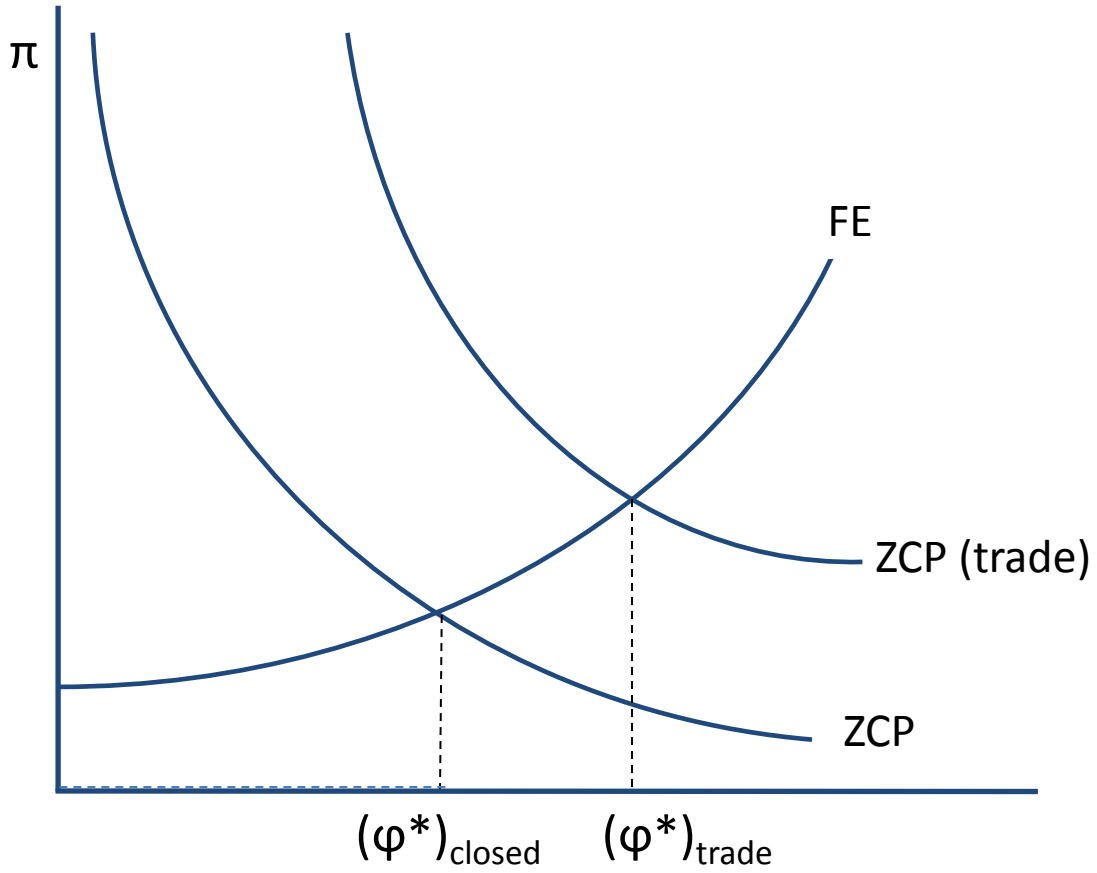
$$\tilde{\varphi} = \left[\frac{1}{M_t} \left(M\tilde{\varphi}^{\sigma-1} + nM_x \left(\tau^{-1}\tilde{\varphi}_x \right)^{\sigma-1} \right) \right]^{\frac{1}{\sigma-1}}$$

Equilibrium conditions in open economy

- The free-entry condition remains unchanged
  - Regardless of export status, the expected value of future profits, in equilibrium, must be equal to the fixed investment cost f_e
- The ZCP is modified as follows:

$$\bar{\pi} = \pi_d(\tilde{\varphi}) + p_x n \pi_x(\tilde{\varphi}_x) = f\left[\left(\frac{\tilde{\varphi}}{\varphi^*}\right)^{\sigma-1} - 1\right] + \frac{1-G(\varphi_x^*)}{1-G(\varphi^*)} f_x\left[\left(\frac{\tilde{\varphi}_x}{\varphi_x^*}\right)^{\sigma-1} - 1\right]$$

Open economy equilibrium



The impact of trade

1. Domestic market selection effect

- The open economy implies an outward shift in the ZCP curve and thus an increase in the cut-off productivity level
- Less productive domestic firms exit

2. Export market selection effect

- $\varphi > \varphi_x^*$ → only high productive firms serve foreign markets

- Both effects reallocate market shares towards more efficient firms with an aggregate productivity gain

The impact of trade (ct'd)

3. The number of firms decreases (domestic market selection) after trade but product varieties increase because of imports: $M_t = M + nM_x$

- Decrease in the number of domestic producers is more than compensated by increase in foreign exporters

- In case of very high trade costs, this number is not compensated, so that product variety drops

- However, even in this case the positive welfare impact of the aggregate productivity effect outweighs the negative welfare impact of the loss of varieties

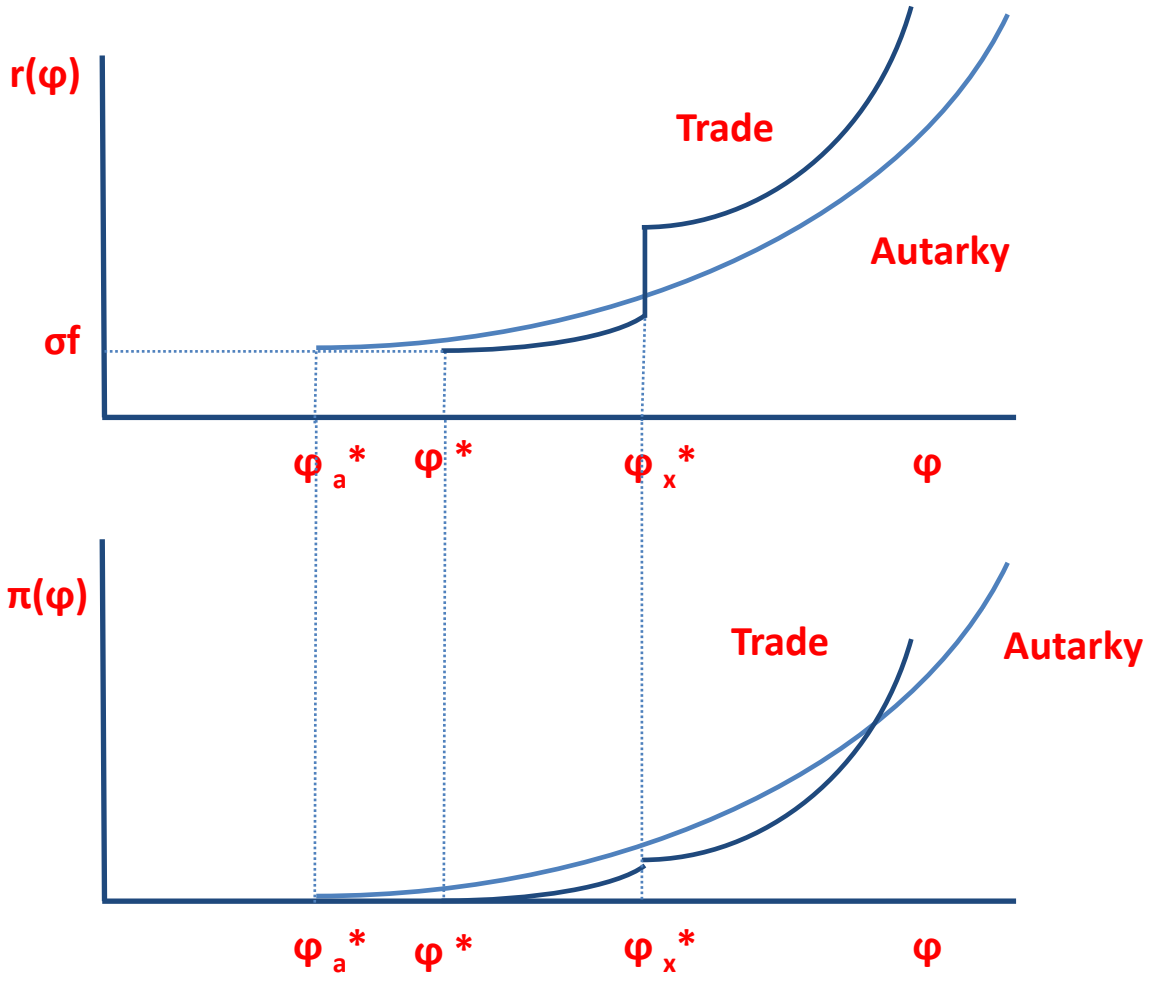
Reallocation of market shares and profits across firms

- All firms incur in a loss in domestic sales in the open economy. A non-exporting firm incurs a total revenue loss

- Exporting firm is more than compensated for its loss of domestic sales by export sales and increased in total revenues. Hence exporting firms gain market share

- Firms are partitioned into two groups: firms with profit gains or losses → only a subset of more productive firms who export gain from trade; among these firms the profit gain increases with productivity (see following picture)

Reallocation of market shares and profits across firms (ct'd)



The mechanism behind the exit of least productive firms

- Labor demand increases due to expansion by existing exporters and new firms beginning to export
- This bids up the real wage and forces the least productive firms to exit
- Another mechanism would be linked to the toughness of competition
  - Increased number of competitors (productive exporters from foreign) raises the degree of foreign market competition
  - In a model with variable mark-ups, Melitz and Ottaviano (2008) show that opening up to trade has pro-competitive effects

The effect of trade liberalization

1. Increase in the number of trading partners

- Following an increase in *n*, the ZCP curve shifts upward
- This raises φ^* and φ_x^*
- The direction of the reallocations of market shares and profits are the same as under the case of movement from autarky to trade
- In particular, the reallocation of market shares generates an aggregate productivity gain and an increase in welfare

The effect of trade liberalization (ct'd)

2. Decrease in variable trade costs

- A decrease in τ also shifts ZCP upwards and raises φ^*
- At the same time, the export cut-off productivity φ_x^* decreases
  - Some firms that could not afford to export start exporting
- At the same time, the export cut-off productivity φ_x^* decreases
  - Some firms that could not afford to export start exporting
- The direction of the reallocations of market shares and profits are the same as under the case of movement from autarky to trade
- In particular, the exit of least productive firms and the reallocation of market shares towards most productive ones generates an aggregate productivity gain and an increase in welfare

The effect of trade liberalization (ct'd)

3. Decrease in fixed market entry costs

- A decrease in f_x has similar effects as the reduction in τ
- φ^* rises
- φ_x^* decreases
- However, only new exporters (not firms that were already exporting) increase their market shares
- Aggregate productivity increase if new exporters are more productive than the average productivity level

c) (Additional) empirical evidence

- Bustos (2011)
- Muendler (2004)
- Alvarez and Lopez (2005)
- Wagner (2005)
- Kimura and Kiyota (2006)

Empirical evidence on Melitz (2003) model

- **Bustos (2011)** by looking at a panel of 1400 Argentinian firms and at a phase of liberalization between Argentina and Brazil from 1992 and 1996 finds that companies in sectors benefiting from comparatively higher reduction in Brazil's tariffs were more likely to export and increase their technology spending than firms in industries where opening was less ambitious

- She also shows that the average productivity gains from trade at the sectorial level are not only explained by the exit of less productive firms or by an expansion of market shares of the more productive firms, but also by a positive impact of participation in export market on firm level performance

Empirical evidence on Melitz (2003) model

- **Muendler (2004)** shows that among the firms not previously exporting, it is the high-productivity firms that become exporters following a reduction in trade costs

- **Alvarez and Lopez (2005)** using firm level data for Chile (1990-1996) find that exporters have higher labor productivity and TFP than non-exporters. Firms make conscious efforts to increase productivity before starting to export. Moreover, they estimate insignificant (or negative) differences in labor productivity and TFP growth for export starters compared to non exporters

Empirical evidence on Melitz (2003) model

- **Wagner (2005)** using plant level German data (1995-2004) finds that three years before entry future exporters had significantly higher productivity in two out of seven years. Growth rates of labor productivity did not differ between starters and non-starters in years before start

- He also finds higher labor productivity for three out of four cohorts of starters compared to matched non-starters in three years following start but effect not statistically significant

- **Kimura and Kiyota (2006)** with data on Japanese firms in the period 1994-2000 find that firms with higher TFP have higher probability to enter export markets and that exporters have 2.4% higher TFP growth than non-exporters if initial TFP level is controlled for

What we learned

1. In a closed economy only more productive firms enter the domestic market (given a fixed cost for producing a certain variety)

2. After trade liberalization (open economy) the minimum productivity level to have positive profits (and thus to survive in the market) increases:
   - Less productive incumbent firms exit the market
   - Only more productive firms enter the foreign market

3. It follows that trade liberalization reduces the number of domestic firms in the market but increases the average productivity level because less productive firms are driven away from the market

4. Empirical evidence largely confirms former theoretical implications

The heterogeneous firm model of international trade

What we learned

1. In a closed economy only more productive firms enter the domestic market (given a fixed cost for producing a certain variety)

2. After trade liberalization (open economy) the minimum productivity level to have positive profits (and thus to survive in the market) increases:
   - Less productive incumbent firms exit the market
   - Only more productive firms enter the foreign market

3. It follows that trade liberalization reduces the number of domestic firms in the market but increases the average productivity level because less productive firms are driven away from the market

4. Empirical evidence largely confirms former theoretical implications

Session 3:
Implications of the new-new theory for normative and positive trade policy analysis

Implications of new-new trade theory for trade policy analysis

- Motivations
- New-new trade policy (Ciuriak et al. 2011)
- Trade policy under firm-level heterogeneity (Demidova Rodriguez-Clare 2009)
- Technical Barriers to Trade under firm-level heterogeneity (Baldwin and Forslid 2010; Felbermayr and Jung 2011)

Implications of new-new trade theory for trade policy analysis

- Most of the traditional trade policy models build on traditional trade model considering country as an aggregate of firms (i.e. countries gain from exporting those goods that they are relatively efficient at producing)

- From the Ricardian model we know that economic welfare could be increased through the mutual specialization induced by a reduction (dismantling) of trade barriers

- The new trade theory (Krugman 1979) shifted the attention from the country to the industry level of analysis; allowing for new sources of welfare gain (efficiency gain from scale of production and increased varieties from imports)

Implications of new-new trade theory for trade policy analysis

- But, as we learned, **firms are very heterogeneous within both countries and industrie**s, and new trade policy models are needed

  - Firms rarely participate in international markets (export, FDI, imported intermediates); exporting only a small share of their production
  - Firms that participate to international markets are different than those that do not (they are larger, more productive and more capital and skill intensive)
  - Exporting firms grow faster than the others in terms of employment and output
  - Firms continuously enter/exit the foreign market
  - Trade liberalization increases average productivity by reallocating market shares and resources within industries from low-productivity firms to high-productivity firms

Implications of new-new trade theory for trade policy analysis

Ciuriak et al. (2011)

Just as firms are heterogeneous, so is the impact of trade policy, depending on the specific facts concerning the population of firms within an industry in a country and the broader economic policy context in which trade policy is implemented

- Traditionally, trade negotiators focus on the existing exported/imported goods and services, but as the new-new trade theory suggests, trade liberalization affects not only existing trade flows, but also the diversification of imported/exported goods

- Thus, the focus of trade negotiators must shift towards extensive margins

- Empirical evidence strengthens this view suggesting a positive impact of WTO membership on extensive margins and a negligible effect on intensive margins

Implications of new-new trade theory for trade policy analysis

Ciuriak et al. (2011)

- Given the existence of fixed and sunk cost to entry in a new foreign market, policy makers should focus on overcoming such costs

- It is often the case that tariffs are already low, but non tariff barriers are still high → the policy should shift to the expensive procedures for getting products across borders → increasing importance of trade facilitation

- Non tariff requirements for market access (conformance with product safety standards and licencing requirements for highly technical products, etc.) are likely to become crucial in trade negotiations

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009)

- In trade models with heterogeneous firms export subsidies can increase productivity by inducing reallocation of labor from less to more productive firms
- This paper shows also how an export subsidy may however reduce overall welfare in an heterogeneous firm model with a small open economy
- Intuition: welfare can be decomposed into four terms: productivity, terms of trade, variety and curvature, where the last is a term that captures heterogeneity across varieties
- An export subsidy generates an increase in productivity, but given the negative joint effect on the other three terms (terms of trade, variety, and curvature), welfare falls
- In contrast, an import tariff improves welfare in spite of the fact that productivity falls

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009)

- Consider an economy with L identical agents spending their income on a continuum of domestic and imported goods v and v' in quantities q(v) and q(v')
- Each agent has the following preferences

$$U\left(\int_{v\in\Omega} q(v)^{\rho}\,dv + \int_{v'\in\Omega_m} q_m(v')^{\rho}\,dv' + \right)^{1/\rho}$$

- Where omegas are the sets of available domestic and imported goods, σ is the elasticity of substitution
- The model develops in a similar fashion as in Melitz (2003) with the main difference that government pays a consumption subsidy for domestic goods and the foreign government pays an ad valorem export subsidy

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009)

- There are four channels through which a trade policy can affect welfare (as per capita utility) in the economy

$$\frac{U}{L} = (productivity\ index) * (TOT\ index) * (variety\ index) * (curvature)$$

- ***Productivity index***: is measured as total output per worker
  - the total output depends on the total number of domestic firms and hence on the productivity threshold (remember the Melitz 2003 model), which among the other parameters, depends positively on the consumption subsidy

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009)

- ***Term of trade index:*** is measured as the ratio of consumed over produced quantity
  - It takes into account the "importance of trade" : the ratio of the price of exports over price of imports is multiplied by the ratio of export share in production to the import share in consumption.
  - The index depends on both consumer and export subsidies

- ***Varieties index***: is simply given by the total amount of varieties consumed at home, that is the total mass of active firms in the economy
  - It depends on the productivity cut-offs for domestic producers and exporters

- ***Curvature***: takes into account both within and cross-country heterogeneity of firms

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009)

- Two distortions in the economy:

1. Domestic distortion created by the mark-up: domestic goods are sold at a price above the opportunity cost, whereas imported goods are sold at a price equal to the opportunity cost, so in the equilibrium there is too little consumption of domestic relative to foreign varieties

- This distortion is neutralized with one of the following three policies:

i. A consumption subsidy that allows consumers to pay a price equal to the producer's marginal cost

ii. An import tariff, which makes consumers pay the same “mark-up” on imported varieties as the one they pay for domestic varieties

iii. An export tax , which makes exporting less attractive to producers, so that resources are shifted toward domestic production and the quantity of each consumed variety rises

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009)

- Two distortions in the economy:

2. Foreign producers generate an increase in consumer-surplus by their entry into the domestic market. Since consumers do not take into account that their spending on imports increases entry by foreign producers, then the mass of the imported varieties is below its optimal value

- This distortion is neutralized with one of the following three policies (opposite to those in the previous case)

i. Consumption tax on domestic varieties

ii. Export subsidy

iii. Import subsidy

- Since the mark-up distortion dominates the consumer-surplus distortion, the resulting optimal policies are a consumption subsidy, an export tax, and an import tariff

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009): the effects of trade policies

Let's assume that the government has currently set the optimal consumption subsidy; what are the **effects of an introduction of an export subsidy**?

- Increasing export subsidy allows less productive firms to export, thus the cut-off for exporters decreases and the mass of exporter firms increases
- To clear trade balance same things happen for the foreign exporters, mass of importing firms increases
- Labor demand at home increases bringing up wages. It makes harder to produce for the domestic market because it increases the cut-off for the domestic production reducing the mass of domestic producers
- Increased mass of importers and decreased mass of domestic producers compensate themselves

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009): the effects of trade policies

- The increased number of exporting firms makes the competition more severe, and only most productive firms survive

- Labor is reallocated from less to more productive firms, and the average productivity increases (which is the same selection effect as in the Melitz model), increasing the first component of the per-capita utility

- But the other three terms of the per-capita utility fall ending up with a welfare loss associated to an export subsidy (with the consumption subsidy already in force)

Implications of new-new trade theory for trade policy analysis

Demidova and Rodriguez-Clare (2009): the effects of trade policies

Let's assume that the government has currently set the optimal consumption subsidy; what are the **effects of an introduction of an import tariff**?

- In this case the productivity index is reduced after the introduction of an import tariff
- The intuition behind this results is that an import tariff shifts consumer spending towards domestic varieties, allowing low productive firms to break even and pulling resources away from higher productivity exporters
- However, since the import tariff is an optimal policy in the presence of the two distortions in the economy (see above), overall welfare increases

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Baldwin and Forslid (2010)

- Using a simplified standard Melitz (2003) model the authors focus on various positive and normative aspects of trade liberalization with heterogeneous firms

- Authors analyse the effects of lower trade costs and the effects of lower regulatory barriers to trade (beachhead costs)

- They find that lower marginal trade costs (when countries are symmetric in size) lower the minimum level of marginal costs to enter the domestic market and rise the minimum level of marginal cost to enter the foreign market (i.e. it becomes harder to produce domestically and easier to export)

- In terms of number of varieties produced in an economy, a reduction in trade costs ends up with a lower number of varieties available in each country

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Baldwin and Forslid (2010)

- The intuition for this anti-variety effect is that freer trade makes it easier for firms to export (both domestic and foreign ones) and thus raises the fraction of foreign-made varieties that are imported to Home

- But this effect is offset by the drop in the domestically produced varieties given by the reduction in the cut-off marginal cost level for domestic firms

- On the other hand, a reduction in beachhead costs (costs due to technical barriers to trade) by better regulation in standards harmonization can facilitate entry in foreign markets. In terms of the model it means that the fixed cost for introducing a new product in the domestic market becomes equal to the cost for introducing a new product in the foreign country (i.e. $F_D=F_X$)

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Baldwin and Forslid (2010)

- Authors find that reducing beachhead cost increases the number of consumed varieties in both small and large countries

- Finally, authors find an interesting Stolper and Samuleson effect in a heterogeneous firms set up: freer trade makes the owner of the X-types firms better than the owner of the D-type firms

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Felbermayr and Jung (2011)

- In this paper authors focus on TBT, analysing two different deregulation scenarios inspired by the recent EU policies:
  1. *T-neutral deregulation*: regulatory costs for domestic and foreign firms are reduced equiproportionally so the relative competitive position of foreign firms remains unchanged
  2. *Incremental mutual recognition*: reduces the entry costs of foreign firms only (de facto it makes additional licensing of goods for exporting gradually redundant)

- The aim is to understand the effect of the two former deregulation policies on productivity levels by final goods producers

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Felbermayr and Jung (2011)

T-neutral deregulation

- In this scenario the fixed cost for entry in the domestic (F_D) and foreign market (F_X) are reduced equiproportionally leaving unchanged their ratio (T)

- It does not affect the probability of export which depends on the ratio T; moreover the entry cutoff levels shift proportionally

- But the industry productivity increases in presence of high external economies of scale and very concentrated productivity distribution (high Pareto distribution parameter)

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Felbermayr and Jung (2011)

Incremental mutual recognition

- In this scenario the fixed cost for entry in the domestic (F_D) market remains unchanged but the entry cost for the foreign market (F_X) is reduced, so their ratio reduces

- It increases the cutoff level for domestic production but decreases the one for exporting → there will be a reallocation of market shares

- The new exporters causes a loss of market share to incumbent exporters and domestic firms

- Since the new exporters are firms with medium levels of productivity, the net effect on average productivity is ambiguous

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Felbermayr and Jung (2011)

After a calibration exercise author find mixed evidence on productivity gains from harmonization

Table 1 Productivity gains and losses from harmonization

Industry	(1) $\Delta\% T_h$	(2) $\Delta\% p_h^x$	(3) $\Delta\% \tilde{\varphi}_h$	(4) $\Delta\% M_h^d$	(5) $\Delta\% M_h$	(6) $\Delta\% A_h$
Chemicals	−24.0	54.4	−10.6	−12.0	23.2	0.0
Rubber and plastics	−24.4	73.0	−7.6	−18.7	22.2	3.8
Leather and footwear	−42.9	211.9	−11.5	−35.3	42.6	7.4
Lumber and wood	−62.1	488.2	−12.0	−43.1	61.7	7.5
Paper products	−23.6	70.6	−8.8	−18.5	21.4	6.3
Textile	−47.1	227.4	−13.5	−33.7	48.6	5.0
Apparel	−37.9	253.1	−9.6	−44.1	33.3	15.8
Non-ferrous metals	−29.1	68.2	−10.8	−13.2	29.8	1.2
Machinery except electrical	−51.7	225.7	−16.5	−29.7	61.2	−5.0
Electrical machinery	−45.3	214.7	−15.9	−34.2	48.7	−2.1
Road vehicles	−48.3	151.4	−19.0	−18.5	58.2	−4.0
Transport equipment	−48.0	173.1	−18.4	−24.2	57.4	1.6
Scientific/measuring equip.	−70.8	588.9	−25.0	−41.2	97.0	−4.5
Optical/photographic equip.	−68.2	586.7	−21.8	−44.4	85.8	−0.9

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Felbermayr and Jung (2011)

- The cut to T=1 is largest for industries with high status quo degrees of competitive disadvantage of importers; it is low for industries with low protection to start with

- The reduction in T induces more firms to export, since less productive firms start to export, there will be a reduction of the average productivity level ($\Delta\%\tilde{\varphi}_h < 0$)

- Due to the increased competition the least productive input producers are forced to exit, thereby there will be a decreasing mass of firms operating domestically $\Delta\%M_h < 0$

Implications of new-new trade theory for trade policy analysis

Technical Barriers to Trade under firm-level heterogeneity : Felbermayr and Jung (2011)

- Finally the net effect of harmonization on industry productivity critically depends on the characteristics of the sectors (productivity distribution and economies of scale)

- It is positive and high for apparel and it is low for knowledge intensive industries (scientific equipment and machinery)

- In these industries the rise in input diversity can not make up for the drop in average productivity of input producers, and the net effect on industry productivity is negative

Implications of new-new trade theory for trade policy analysis

What we learned

- New New trade model and the heterogeneity of firms need to reconsider the traditional trade policy literature

- Trade policies such as tariffs, subsidies, etc. have more than simple traditional *Term of Trade effect.* They potentially affect:

  - The probability to survive for a firm competing in the domestic market
  - The probability of entry the foreign market
  - The average industry productivity level

Session 4:
Implications of the new-new theory for normative and positive trade policy analysis: *political economy*

New-new trade theory and the Political Economy of Trade Policy

- Motivations
- Endogenous Trade Policy with Heterogeneous firms: Abel-Koch (2010)
- Firm heterogeneity and lobby participation (Bombardini 2008)
- Protection for Sale with Heterogeneous Interests within Industries (Chang and Willmann 2006)

New-new trade theory and the Political Economy of Trade Policy

- Traditional models on the Political Economy of Trade Policy assume heterogeneity of sectors, mainly in terms of concentration as in Grossman and Helpman 1994

- The main message coming from this literature is that interest groups influence the government's choice on trade policy through the promise of votes, monetary donations and campaign support

- The government grants protection from foreign competition to a sector by comparing the benefits that it receives from the industry's lobby and the welfare loss from the protection measures

New-new trade theory and the Political Economy of Trade Policy

- These models have failed in investigating the behaviour of firms in forming the interest groups; little attention has been devoted to the role played by firms in shaping the structure of protection across sectors

- The new-new trade theory by giving a crucial role to the single firm suggested new Political Economy of Trade Policy models in which the decision of whether to lobby and how much to contribute is made by individual firms

New-new trade theory and the Political Economy of Trade Policy

Endogenous Trade Policy with Heterogeneous Firms: Abel-Koch (2010)

- The need for an heterogeneous firms based model of Trade Policy formation comes from the empirical evidence that larger firms make higher contributions to political action committees in the U.S. (Drope and Hansen 2006; Sadrieh and Annavarjula 2005)

- Similarly in EU large firms have often an office in Brussels and to be accredited to lobby the European Parliament (Bernhagen and Mitchell 2006)

- On the other hand, small firms rarely engage in political lobby because of financial constraint

Endogenous Trade Policy with Heterogeneous Firms: Abel-Koch (2010)

- This model builds on the Melitz (2003) model; assuming a mass of firms producing varieties of differentiated good with heterogeneous marginal costs

- To sell their product in foreign market firms have to pay a fixed entry cost (as the cost for adapting the product to local standards)

Endogenous Trade Policy with Heterogeneous Firms: Abel-Koch (2010)

- Two different trade policy that governments might set:

1. *"behind-the-border"* are non tariff measures as additional regulation which raise the fixed costs of entry the foreign market; these measures leave the ratio of market access cost for foreign exporters to market access cost for domestic producers unchanged

2. *"border measures"* affect only foreign exporters raising the ratio of market access costs for foreign exporters to market access costs for domestic producers

Endogenous Trade Policy with Heterogeneous Firms: Abel-Koch (2010)

- When a country introduces "behind-the-border" measures, domestic potential exporting firms and foreign exporters with relatively high marginal costs cannot afford the entry fixed cost and exit the market
- This increases the market share (and profits) of surviving firms → within country profits shift
- But it might also shift profits from domestic to foreign firms if the share of highly productive domestic firms is lower than the share of highly productive foreign firms

Endogenous Trade Policy with Heterogeneous Firms: Abel-Koch (2010)

- As a consequence, if only large firms engage in lobbying their government, they will push for a "behind-the-border" measure that shifts profits towards them

- If government is interested in monetary contribution from those firms (in addiction on its social welfare interest) it will set "behind-the-border" measures

- The equilibrium level of "behind-the-border" measure will be the larger, the stronger the profit shifting effect between domestic firms and the lower the government's concern about the social welfare in the country.

Endogenous Trade Policy with Heterogeneous Firms: Abel-Koch (2010)

- When a country introduces "border measures" it drives the least efficient foreign firms out of its market allowing less efficient domestic firms to start producing → profit shift towards domestic less efficient firms
- As in the former case, the introduction of a border measure reduces the consumer surplus, thus it would never be implemented by a purely social welfare maximizing government
- But if the government is interested also in monetary contribution by domestic lobbing firms, it will set a "border measure". In particular:
  1. If the largest domestic firm gain a lot from protection, it will exert a strong lobby pressure and the highest possible level of border measure will be implemented
  2. If the largest domestic firm does not gain a lot from protection and the government cares a lot about social welfare, the border measure will not be implemented

New-new trade theory and the Political Economy of Trade Policy

Firm heterogeneity and lobbying participation: Bombardini (2008)

- In this model, once the firm decides to participate in political activity, it presents the government with a contribution schedule that associates a monetary contribution to each degree of protection

- The novelty of this paper (with respect Grossman and Helpman 1994) is that the strength of lobby is not the size of the sector *per se* but the share of the total industry output produced by firms that make positive contributions

- In this model each firm aiming to participate to the lobby needs to pay a fixed cost as an initial expenses to play an active role in the sector lobby

- The new marginal firm will be accepted into the sectorial lobby if and only if its marginal contribution to the lobby is higher than its cost for the lobby

Firm heterogeneity and lobbying participation: Bombardini (2008)

- At the equilibrium, the level of protection τ_{ij} depends on several factors:

1. The lower the import penetration the larger the deviation from the free trade condition
2. For sectors with positive tariff, the size of the output affect positively the level of protection because large firms receive large benefit from the increase in price p and the government can expect large contributions
3. Since the distortion induced by protection is lower in low price elasticity of imports sectors, in these sector the protection is large
4. The larger the share of total sector output produced by lobbying firms, the larger are the marginal contributions the government expects, the higher is the level of protection

Firm heterogeneity and lobbying participation: Bombardini (2008)

- Finally, an increase in the dispersion of firms within each sector, holding the mean constant, brings an increase in level of protection

- The underlying intuition is that in sectors where the size distribution has a larger standard deviation, a larger share of firms willing to pay the fixed cost F could be found, it ends up with a larger group of firms able to participate to the policy game and thus to a higher level of protection

Firm heterogeneity and lobbying participation: Bombardini (2008)

- Author provides also empirical evidence of the model in four points, finding that:

1. Sectors characterized by higher dispersion in firm size have an higher level of protection

2. Larger firms are more likely to take part in the lobby

3. The participation share is positively correlated with the dispersion in the size distribution

4. The level of protection depends not simply on the sector's total output but also on the participation shares

Firm heterogeneity and lobbying participation: Bombardini (2008)

Sectors characterized by higher dispersion in firm size have an higher level of protection (here measured by NTB frequency)

Dependent variable: NTB_i	Regression using Gawande organization dummy						Organization dummy FEC data	
	GB*	I	II	III	IV	V	VI	VII
$I_i(z_i/e_i)$	1.83 (0.74)	1.97 (0.87)	1.47 (0.75)	1.56 (1.04)	1.53 (0.77)	1.58 (0.81)	2.3 (1.16)	1.55 (0.6)
z_i/e_i	−1.73 (0.70)	−1.82 (0.85)	−1.38 (0.73)	−1.46 (1.022)	−1.43 (0.75)	−1.44 (0.79)	−2.21 (1.15)	−1.62 (0.58)
σ_i(/1000)		0.44 (0.063)	0.37 (0.12)	0.04 (0.018)	0.39 (0.08)	0.48 (0.06)	0.42 (0.06)	
μ_i(/1000)		0.04 (0.04)	0.04 (0.05)	0.01 (0.08)	0.05 (0.05)	0.037 (0.047)	0.033 (0.049)	
I_i			0.01 (0.02)	0 (0.00)	0.01 (0.02)	0.008 (0.019)	0.021 (0.022)	0.024 (0.006)
Total sales (/10 M)			5.6 (7.61)	0.015 (0.007)				
Total value added (/1 M)					1.5 (1.69)			
Concentration4						−0.015 (0.37)		
Herfindahl						−0.01 (0.009)		
$I_i\sigma_i$(/1000)								0.42 (0.02)
$I_i\mu_i$(/1000)								0.031 (0.008)
$N_i\sigma_i$(/1000)								−1.93 (0.92)
$N_i\mu_i$(/1000)								6.77 (2.1)
F-test joint σ_i μ_i **		0.00	0.00	0.04	0.00	0.00	0.00	0.00
F-test model**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
J-test overidentification**	0.33	0.2	0.26	0.47	0.23	0.19	0.35	0.37
Centered R^2	0.24	0.32	0.33	0.3	0.32	0.33	0.32	0.33
No. of observations	226	226	226	226	226	226	226	226
Estimator	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS

Firm heterogeneity and lobbying participation: Bombardini (2008)

- z_i is the inverse of import penetration share; e_i is the price elasticity of imports; I_i is a dummy variable describing whether the sector is politically organized and σ is the dispersion of firms size in each sector

- Thus in non-organized sectors a larger size of the industry output relative to imports (and smaller elasticity) decreases the tariff level (second row in the former table)

- In organized sectors a larger size of the industry output relative to imports (and smaller elasticity) increases the tariff level (first row in the former table)

- Sectors with high dispersion in firms size have an higher protection level (third row in former table)

Firm heterogeneity and lobbying participation: Bombardini (2008)

Large firms are more likely to take part in the lobby

Unit of observation	Dependent variable		Pooled: all sectors		Coefficients of 3-digit SIC level regressions				
					Mean	SD	No. of 3 digit SIC sectors	No. of 3-digit SIC sectors with positive coefficient	No. of 3-digit SIC sectors with positive coefficient
			I	II	III	IV	V	VI	VII
Panel 1									
Firm	Contribution level	Intercept	−0.454 (0.02)	−0.588 (0.058)	0.54	2.02			
		log(Sales)	0.055 (0.003)	0.094 (0.015)	0.07	0.20	86	83	41
		log(Sales) squared		−0.003 (0.001)					
		No. of Firms	3027	3027					
		Estimator	Tobit	Tobit				Tobit	
Panel 2									
Firm	Probability of participating of individual firm	log(Sales)	0.032 (0.003)		0.07	0.08	81	80	55
		No. of firms	3032						
		Estimator	Probit					Linear probability	

Firm heterogeneity and lobbying participation: Bombardini (2008)

- The amount of contributions by each firm increases as a function of firm size (here measure as the log of sales) both in the linear (column 1) and quadratic (column 2) specification – panel 1 in the former table

- The probability that the firm participates in the lobby is increasing with the firm size – panel 2 in the former table

New-new trade theory and the Political Economy of Trade Policy

Firm heterogeneity and lobbying participation: Bombardini (2008)

The level of protection depends not simply on the sector's total output but also on the participation shares

Dependent variable NTB_i	
$\theta_i I_i(z_i/e_i)$	13.78 (3.24)
z_i/e_i	−0.28 (0.11)
Implied $a/(1+a)$	0.9986
Implied α_L	0.0197
Estimator	GMM
F-test joint significance $\theta_i I_i(z_i/e_i)$ (z_i/e_i) p-value	0.00
F-test model p-value	0.00
J-test overidentification p-value	0.18
Shea*Partl R^2/Partl. R^2	.92/.91
Shea*Partl R^2/Partl. R^2	.86/.86
Centered R^2	0.25

- In sectors that are politically organized (I_i=1) the level of protection is higher the higher the output, the lower the imports, the lower the price elasticity of imports and the higher the participation rate (θ_i)

New-new trade theory and the Political Economy of Trade Policy

Protection for Sale with Heterogeneous Interests within Industries: Chang and Willmann (2006)

- This paper builds on the empirical evidence that government weigh social welfare more than 95%, leaving very small room for monetary contributions in its maximization function

- If one believes these numbers, why economists should take care about the lobby power in endogenously determined Trade Policies? Why lobby parties seem to have a lot of power in influencing governments decision on trade policies?

- This paper tries to provide an explanation for the gap between empirical evidence and common sense about the power of lobby parties, using the new-new trade theory approach

New-new trade theory and the Political Economy of Trade Policy

Protection for Sale with Heterogeneous Interests within Industries: Chang and Willmann (2006)

- New-new trade theory suggests that exporting firms are different from non-exporting firms. The authors focus on this dichotomy (within each industry) to explain different behaviour of exporting vs. non-exporting firms in lobbying for trade policies

- They show that exporting firms are interested in market access abroad, pushing for lower tariff level

- However, purely domestic firms desire an high degree of protectionisms

Protection for Sale with Heterogeneous Interests within Industries: Chang and Willmann (2006)

- If both groups are organized and lobby the government to take into account their interests it gives rise the following scenario:

1. If any of the two groups lobbies, the government sets the pure social optimal policy (contributions are zero in this case)

2. If both groups lobby the same social optimal tariff will be reached because the two lobbying efforts neutralize each other

3. When each group lobbies alone, it is able to divert the government's policy towards its preferred trade policy: a higher tariff in the case of purely domestic firms and lower protection for exporters

Protection for Sale with Heterogeneous Interests within Industries: Chang and Willmann (2006)

- This model provides a possible explanation on the high weight that governments assign to social welfare in their decision

- This model allows the possibility of government's pure social maximization solution even in presence of monetary contribution by lobbying groups

New-new trade theory and the Political Economy of Trade Policy

What we learned

- New-new trade theory and the heterogeneous firms model changed the Trade Policy formation

- Tariff and non-tariff measures are still the results of a lobby game; but it is no more just the industry specific lobby power determining the industry protection level (as in the Helpman Grossman 1994 model)

- In these new models of endogenous trade policy are the firms characteristics (size, productivity, etc) that affect the lobby power by firms and the decision itself of firms to join an interest group