Exporting Firms and the Demand for Skilled Tasks

Irene Brambilla (UNLP)
Daniel Lederman (WBG)
Guido Porto (UNLP)

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Motivation

- Explore relationship between exporting and skilled tasks
  - theory and evidence from Chilean manufacturing firms

- Combine two strands of literature:
  - exporting, skills and quality (Verhoogen, 2008; Brambilla, Lederman and Porto, 2012; Bastos, Silva, Verhoogen, 2014)
  - trade and tasks (Feenstra and Hanson, 1996; Antras, Garicano, and Rossi-Hansberg, 2006; Grossman and Rossi-Hansberg, 2008; 2012; Acemoglu and Zilibotti, 2001; Acemoglu and Autor, 2011; Costinot and Vogel, 2010)

Intuition

- Production involves many tasks:
  - Management, accounting, clerical, design, packaging, logistics, sales representation, operational production, input control, monitoring, supervision, other services
- Tasks are executed by workers with different skills:
  - Technology: some tasks are skill-intensive, others are unskilled-intensive

- Firms produce goods of varying quality( )]TJ[qu44/2.u0.4 1 Tf21n9(e)1.6(i)1

This Paper

Model: Outline

- Objective: establish theoretical links between export intensity and skilled tasks
- Quality demand is modeled with Logit utility (as in Verhoogen)
- Firms choose quality, quantity and price to maximize profits

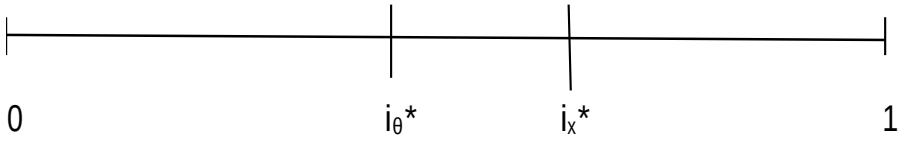
Model: Outline

- Quality is produced with a collection of tasks
- Quantity is produced with a collection of tasks
- Quality and Quantity are produced separately

- A given task (in quantity or quality production) can be performed by either skilled or unskilled workers
- Assume Ricardian (fixed coefficient) technology
- Given skilled and unskilled wages, determine cutoff of relative skilled utilization in both activities

Model: Cut-offs for Utilization of Skills

tasks are in increasing order of skilled intensity; tasks above i_x^* in output production and above i_ϑ^* in quality production are performed exclusively by skilled workers; the quality cutoff is lower than the output cutoff because quality production is more skilled intensive than output production (by assumption)

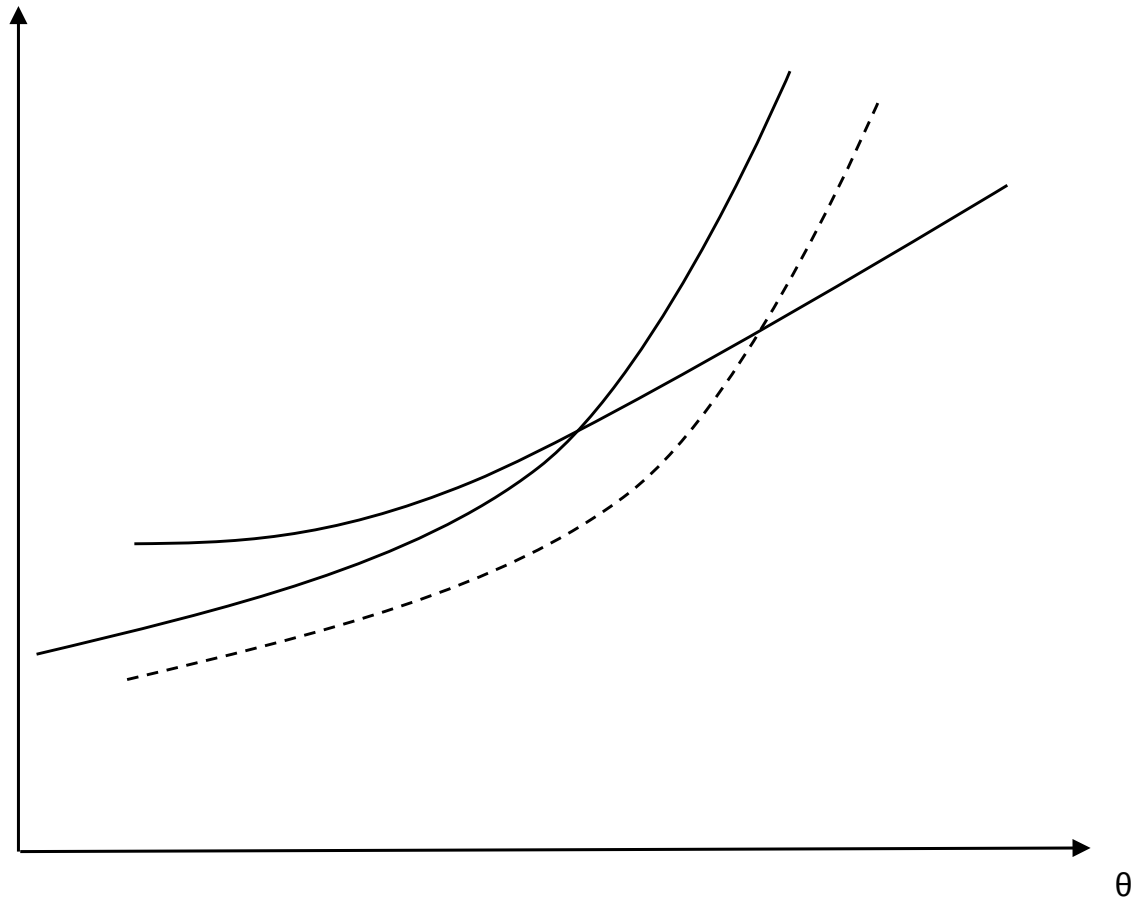


Production

- Quantity: constant returns to scale in tasks – thus constant marginal costs
- Quality: decreasing returns to scale in tasks – thus increasing marginal cost
- Firm productivity λ affects quality (but no quantity to simplify)
  - more productive firms have lower marginal costs and thus choose higher quality

Relative

Profit Maximization: Marginal Costs and Marginal Revenue as Functions of Quality



Exporting and Skill Utilization

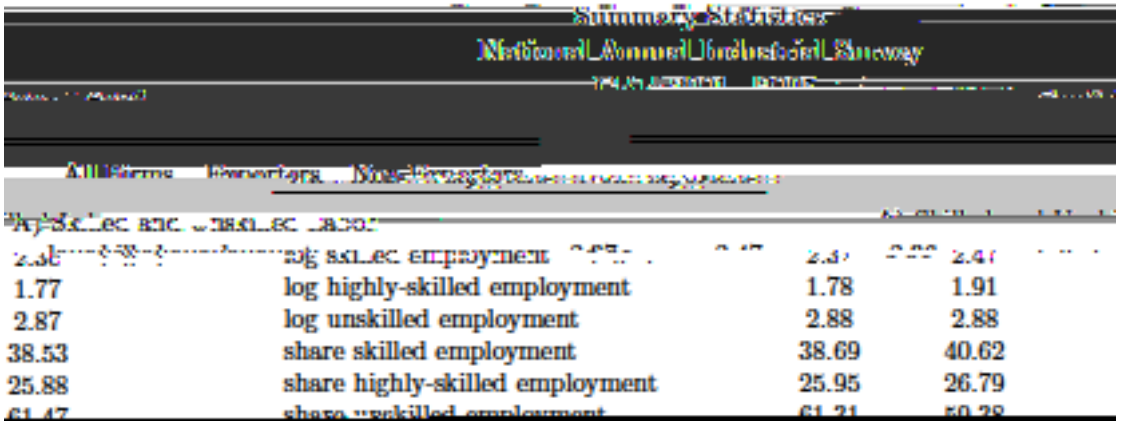
- Exporting requires a fixed cost
- More productive firms self-select into exporting
- They produce higher quality goods for export
  -

Chilean Data

- Encuesta Nacional Industrial Anual (ENIA)
- All manufacturing plants with 10 workers or more
- Customs data: records on firms exports by destination: 2001-2005
- Built 5-year panel of Chilean manufacturing firms
  - industry affiliation, ownership type, sales, exports, input use, imports of materials, labor
  - detailed employment records; define tasks: management (directors), 0 0 20.87 typbtes

Summary Statistics

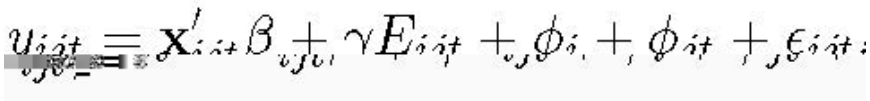
Table 1



1.77	log highly-skilled employment	1.78	1.91
2.87	log unskilled employment	2.88	2.88
38.53	share skilled employment	38.69	40.62
25.88	share highly-skilled employment	25.95	26.79

Regression Model

- Regression model:



  - *E*: export intensity of firm i
  - **x**: firm controls (log total employment, log sales, initial conditions)
  - firm and industry-year fixed effects

  - add controls sequentially

OLS-FE Results

Table 2

The Demand for Tasks and Exports

(log employment)

OLS-FE

)	(2)	(3)	(4)	(1

Endogeneity and IVs

- Export intensity can be endogenous

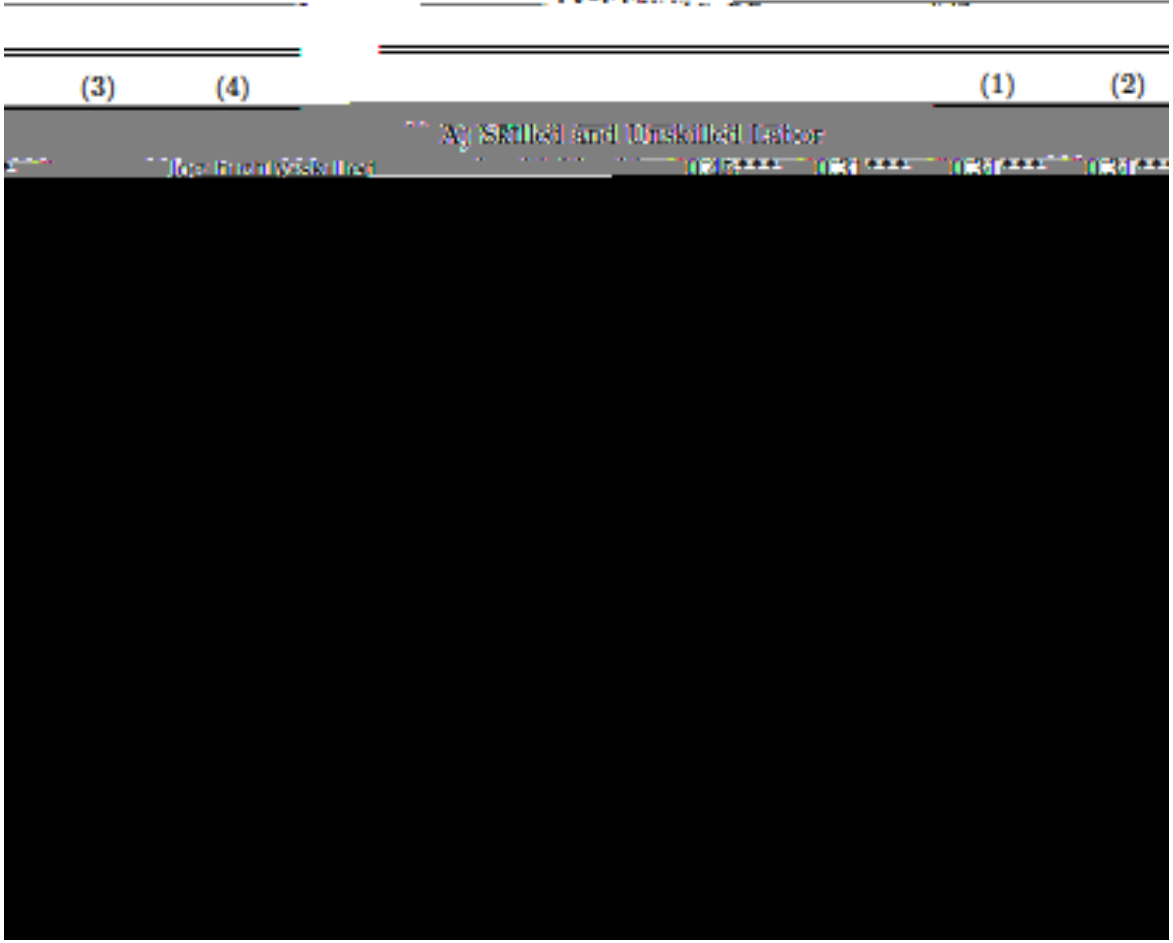
First Stage Results

Table 3
First Stage Results
(exports /sales on z^0 and z^1)

	(1)	(2)	(3)	(4)	
	0.0033***	0.0030***	0.0035***	0.0029***	average real gdp
	(0.0099)	(0.0098)	(0.0090)	(0.0088)	(z^0_{jt})
* initial sales	0.0012*	0.0011*	0.0010*	0.0011*	average real gdp
	(0.0006)	(0.0006)	(0.0006)	(0.00068)	$(z^0_{jt} * s_{j0})$
ea. exchange rate	-0.0271	-0.0262	-0.0258	-0.0263	average r
	(0.0202)	(0.0201)	(0.0190)	(0.0189)	(z^1_{jt})
s	average real exchange rate * initial sales	0.0018	0.0018	0.0017	0.001
	$(z^1_{jt} * s_{j0})$	(0.0014)	(0.0014)	(0.0013)	(0.001
0.4682	0.4683	R^2		0.4682	0.4688
0.0000	0.0000	Prob > F		0.0000	0.0000

IV-FE Results

Table 4
The Demand for Tasks and Exports
(log employment)



IV-FE Results

Table 5
The Demand for Tasks and Exports
(shares of employment)