THE ROLE OF THE SKILL ENHANCING TRADE IN BRAZIL

Bruno Cesar Araujo[1], Francesco Bogliacino[2], and Marco Vivarelli[3]

May 11th, 2008

[1]IPEA
[2]Universidad EAFIT
[3]Università Cattolica di Milano

Outline of the Presentation

- ### **Increasing Inequality: The Debate**
- The Brazilian Case
- Data
- Preliminary Evidence
- Econometric Results
- Conclusions

There are almost two decades of competing explanations for the increase in inequality in developed countries (Acemoglu, 2002) and a rising literature on Low and Middle Income Countries. The shift into the focus is originated by the debate over the role of trade.

(Over) simplifying HOSS: openness generates specialization, by DCs on skilled labour and by LMICs on unskilled labour. **But then why inequality has increased in the latter?**
Caveat:

- ▶ HOSS is a long run model
- ▶ HOSS is not deemed to capture just the 2-2-2 case
- ▶ **technology matters**

Openness spurs technological change. Complementarity effect:

- ▶ in R&D or domestic innovation
- ▶ technology adoption effect (Nelson and Phelps, 1966)
- ▶ **SETI**, Robbins, 2003

Related Literature:

- ▶ Meschi et al. (2009) for Turkey; Berman and Machin (2004) and Conte and Vivarelli (2008) for a sample of LMIC; Hanson and Harrison (1999) for Mexico; Meschi and Vivarelli (2009) for 65 LDC.
- ▶ Pavnick et al. (2003) and Attanasio et al. (2003) respectively for Brazil and Colombia (they deduce SBTC but don't measure it explicitly).
- ▶ Posso (2009) for COlombia

Outline of the Presentation

▶ Increasing Inequality: The Debate
▶ **The Brazilian Case**
▶ Data
▶ Preliminary Evidence
▶ Econometric Results
▶ Conclusions

Brazil follows a story comparable to other Latin American countries: from import substitution to step-wise liberalization policies. De Negri and Turchi (2007) document heterogeneous response by firms, including the birth of *elite* firms.
Huge increase in import and export, especially after 2000.
Huge increase in supply of skilled workers.

Outline of the Presentation

- ▶ Increasing Inequality: The Debate
- ▶ The Brazilian Case
- ▶ **Data**
- ▶ Preliminary Evidence
- ▶ Econometric Results
- ▶ Conclusions

- ▶ PIA: Industrial Survey
- ▶ RAIS: Employee level survey for formal sector
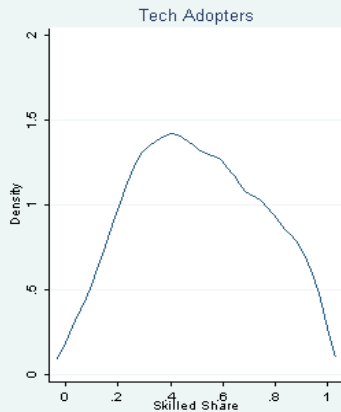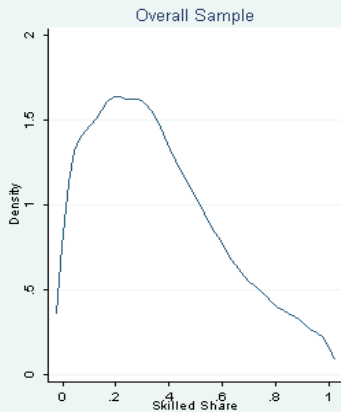- ▶ SECEX: import export census

Around 11000 firms for 1997-2005, perfectly balanced panel
Skilled workers are those with at least secondary education
(Gonzaga et al. 2006).
The SET variable is the import of capital goods.

Outline of the Presentation

- ▶ Increasing Inequality: The Debate
- ▶ The Brazilian Case
- ▶ Data
- ▶ **Preliminary Evidence**
- ▶ Econometric Results
- ▶ Conclusions
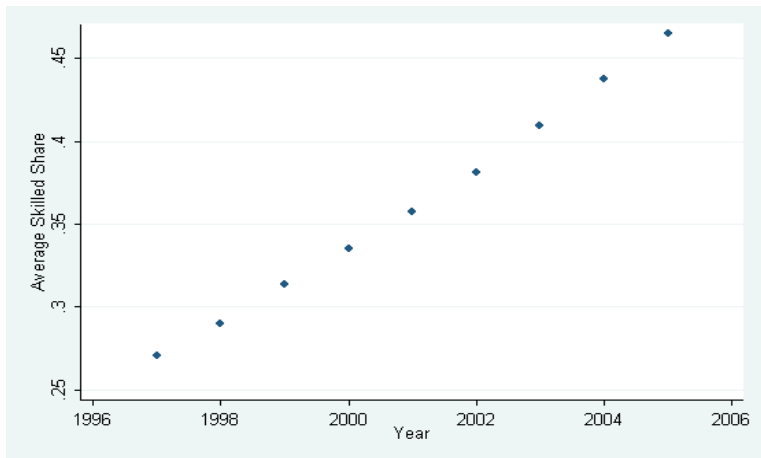
Decomposition analysis:

$$\Delta SL = \sum_{i=1}^{n} \Delta SL_i \bar{P}_i + \sum_{i=1}^{n} \Delta P_i \bar{S} L_i$$

	Within	Between	Overall
1997-2005	0.23	-0.01	0.22
1997-1998	0.03	0.00	0.03
1999-2001	0.06	-0.01	0.05
2002-2005	0.08	0.00	0.08

Outline of the Presentation

- ▶ Increasing Inequality: The Debate
- ▶ The Brazilian Case
- ▶ Data
- ▶ Preliminary Evidence
- ▶ **Econometric Results**
- ▶ Conclusions

A two equations approach:

$$\log S_{it} = \alpha_0 + \rho \log S_{it-1} + \alpha_1 \log Y_{it} + \alpha_2 \log K_{it} + \alpha_3 \log R\&D_{it} + \\ \alpha_4 \log SET_{it} + \alpha_5 \log ws_{it} + \alpha_6 \log wu_{it} + u_i + \epsilon_{it}$$

$$\log U_{it} = \beta_0 + \psi \log U_{it-1} + \beta_1 \log Y_{it} + \beta_2 \log K_{it} + \beta_3 \log R\&D_{it} + \\ \beta_4 \log SET_{it} + \beta_5 \log ws_{it} + \beta_6 \log wu_{it} + v_i + e_{it}$$

Identification Strategy

GMM robust standard errors, instruments up to third lags together with time and industry dummies. Endogeneity problems (wages but also the other ones because of high persistence).

	(1)	(2)
Log(Skilled$_{i,t-1}$)	0.701	0.690
	[0.014]***	[0.014]***
Log(Skilled Wage)	-0.561	-0.582
	[0.036]***	[0.036]***
Log(Unskilled Wage)	0.192	0.158
	[0.055]***	[0.055]***
Log(Sales)	0.241	
	[0.011]***	
Log(Value Added)		0.276
		[0.013]***
Log(Capital)	0.035	0.025
	[0.012]***	[0.012]***
Log(SET)	0.010	0.013
	[0.003]***	[0.003]***
Log(Royalties)	0.001	0.001
	[0.002]	[0.002]

Table: Skilled Workers Equation

	(1)	(2)
Log(Unskilled$_{i,t-1}$)	0.827	0.826
	[0.017]***	[0.017]***
Log(Skilled Wage)	-0.155	-0.152
	[0.033]***	[0.033]***
Log(Unskilled Wage)	-0.395	-0.394
	[0.062]***	[0.062]***
Log(Sales)	0.152	
	[0.011]***	
Log(Value Added)		0.162
		[0.012]***
Log(Capital)	0.011	0.005
	[0.012]	[0.012]
Log(SET)	-0.001	-0.000
	[0.003]	[0.000]
Log(Royalties)	-0.001	-0.001
	[0.002]	[0.002]

Table: Unskilled Workers Equation

Robustness Check

$$\log SS_{it} = \alpha_0 + \rho \log SS_{it-1} + \alpha_1 \log Y_{it} + \alpha_2 \log K_{it} + \alpha_3 \log R\&D_{it} +$$
$$\alpha_4 \log SET_{it} + \alpha_5 \log ws_{it} + \alpha_6 \log wu_{it} + u_i + \epsilon_{it}$$

	(1)	(2)
Log(Skilled Share$_{i,t-1}$)	0.841	0.842
	[0.012]***	[0.012]***
Log(Skilled Wage)	-0.065	-0.066
	[0.007]***	[0.007]***
Log(Unskilled Wage)	0.140	0.139
	[0.012]***	[0.012]***
Log(Sales)	0.005	
	[0.002]***	
Log(Value Added)		0.203
		[0.002]***
Log(Capital)	0.000	0.001
	[0.002]	[0.002]
Log(SET)	0.001	0.001
	[0.000]***	[0.000]***
Log(Royalties)	0.000	0.000
	[0.001]	[0.000]

Table: Skilled Share of Labor Cost Equation

◀ ▢ ▶ ◀ 🗗 ▶ ◀ 🗏 ▶ ◀ 🗏 ▶ 🗏 ᕽᕽᕽ

Outline of the Presentation

- ▶ Increasing Inequality: The Debate
- ▶ The Brazilian Case
- ▶ Data
- ▶ Preliminary Evidence
- ▶ Econometric Results
- ▶ **Conclusions**

Concluding Remarks

It depends on how much inequality a society is willing to tolerate.
The simplest receipt could certainly be to meet the requirement of
the market (more and better educated workers).

THANKS

francesco.bogliacino@gmail.com