Discussion of

International Trade, Technology and the Skill Premium

by Ariel Burstein, Jonathan Vogel

Ferdinando Monte
Johns Hopkins University

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Introduction

- Trade impacts the skill premium through:
  - H-O mechanism (across sectors)
  - Skill-biased technology (within sectors)

- Calibration using 65 countries, many sectors
  - three counterfactual analyses
  - Very rich framework, very deep analysis

- One comment about of the calibration strategy for α_j
  - Why it may be worth improving (theoretically and empirically)
  - A suggestion on implementation

Skilled/unskilled labor across sectors and countries

- Properties of the model:
  - measured skill intensity of a sector:

$$\frac{H_{us}(j)}{H_{us}(j)+L_{us}(j)}$$

  - measured average wage of a sector:

$$\bar{w}_{us}(j)=\frac{s_{us}H_{us}(j)+w_{us}L_{us}(j)}{H_{us}(j)+L_{us}(j)}$$

  - can be both expressed as a function of $H_{us}(j)/L_{us}(j)$, where

$$\frac{H_{us}(j)}{L_{us}(j)}=\frac{\alpha_j}{1-\alpha_j}\left(\frac{s_{us}}{w_{us}}\right)^{-\rho}\times\Phi_{us,j}$$

- Two countries, same sector, same skill premium: two different skill intensities and wages

more...

Calibrating skill intensity

- Parameter α_j is constant across countries for different sectors
- Set:

$$\hat{\alpha}_j^{(n)} = \frac{H_{us}(j)}{H_{us}(j) + L_{us}(j)} = \hat{\alpha}_j \text{ for all countries } n$$

  - Not a model limitation, but a data limitation
  - used also outside trade (e.g. Rajan and Zingales (1998) for dependence on external finance)

- If the true data generating process *is the model*, however,

$$\begin{aligned} \frac{H_{us}(j)}{H_{us}(j) + L_{us}(j)} &\neq \frac{H_n(j)}{H_n(j) + L_n(j)} \\ \bar{w}_{us}(j) &\neq \bar{w}_n(j) \end{aligned}$$

  even if $s_{us}/w_{us} = s_n/w_n$

- The model itself would suggest a country-by-country calibration

Wage rank correlations across countries

- Are average wages ordered similarly across countries?
  - Figure 1, Sampson (2011): rank correlation b/w mfg wages in a country and US

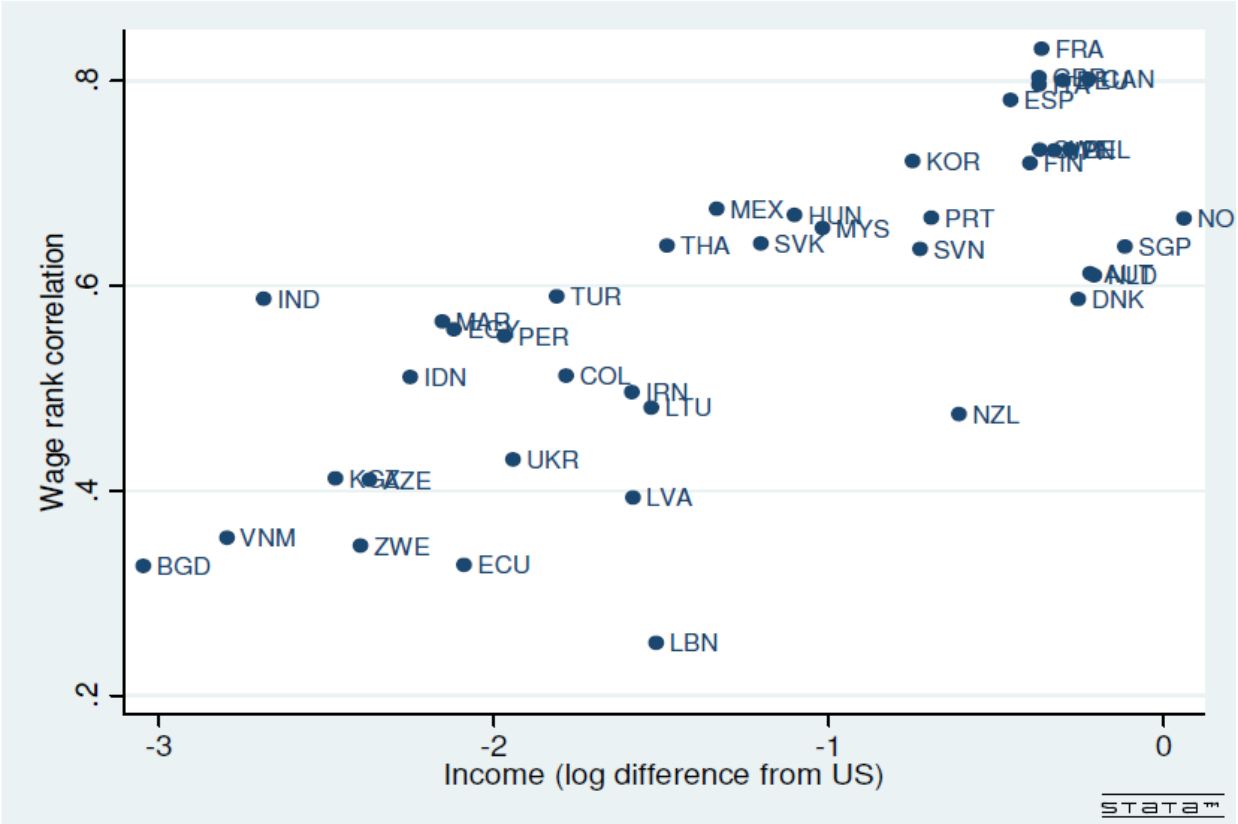


Figure 1: Wage rank correlations – UNIDO 2000

Using wage rankings to order skill intensity

- Average wage $\bar{w}_n(j)$ is increasing in skill intesity across sectors within countries
- Use UNIDO data on average wage across mfg sectors to order skill intesities:

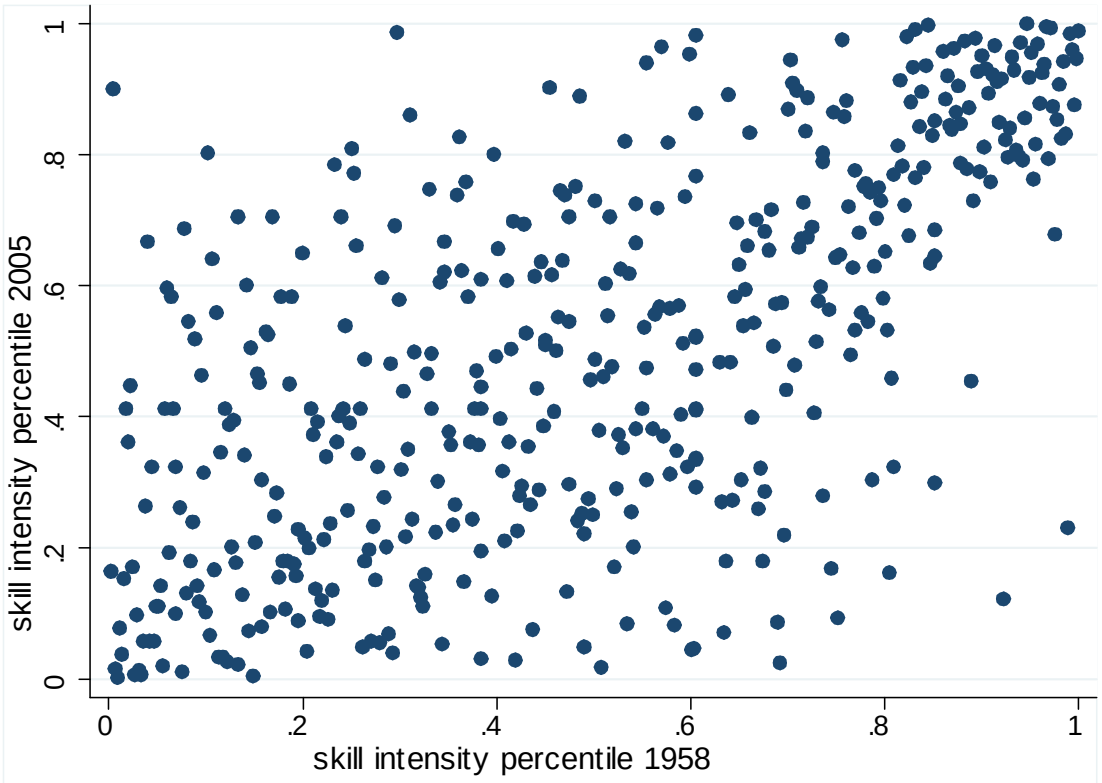
$$\frac{H_n(j)}{L_n(j)} = \frac{\bar{w}_n(j) - w_n}{s_n - \bar{w}_n(j)} \Longrightarrow$$

$$\bar{w}_n(j) \geq \bar{w}_n(j') \Longleftrightarrow \frac{H_n(j)}{L_n(j)} \geq \frac{H_n(j')}{L_n(j')} \Longleftrightarrow \hat{\alpha}_j^{(n)} \geq \hat{\alpha}_{j'}^{(n)}$$

- Limitations:
  - to compute $H_n(j)/L_n(j)$ directly, we'd need data on country n's skill premium
  - UNIDO does not cover all countries in the paper

Skill intensity correlations over time

- Does skill intensity change over time? (see also Sampson 2011):
  - Ranking of skill intensity in '58 vs '05 across 451 mfg sectors (from NBER productivity database)



▸ changes in ranking...

Using capital per worker to pin down skill intensity

- Predict the skill intensity in sector j, country n with the skill intensity in sector j in US, when its capital per worker was the same as $(K/wkr)_n$
- Two steps:
  - From NBER Productivity Database,

$$\log \frac{H_{us,t}(j,t)}{H_{us,t}(j,t)+L_{us,t}(j,t)} = -0.94 + 0.15 \log \left[\frac{K(t)}{wkr(t)}\right]_j + \\ + ind.\ dummies + \varepsilon$$

    has $R^2 = 0.87$
  - Set

$$\hat{\alpha}_j^{(n)} = \exp\left\{-0.94 + 0.15 \log (K/wkr)_n + \delta_j\right\}$$

- Time variation in capital per worker in the dataset should be enough to cover cross-sectional variability in capital per worker ▸ why?

To conclude

- Can use more data to
  - discipline choice of vectors of $\alpha_j^{(n)}$ for different countries
  - compare predictions in the alternative parameterization to assess sensitivity of results and parsimousness of the model

- Suggestions are further refining on a paper already very rich and very robust

Skilled/unskilled ratio

The skilled unskilled ratio in sector j is:

$$\frac{H_{us}(j)}{L_{us}(j)} = \frac{\alpha_j}{1-\alpha_j}\left(\frac{s_{us}}{w_{us}}\right)^{-\rho}\Phi_{us,j}\left(\{\tau_{us}\}\right)$$

with

$$\begin{aligned}\Phi_{us,j}\left(\{\tau_{us}\}\right) &= \frac{\sum_n E_z^1\left[c_{us,n}^{\rho}\left(\alpha_j, s_i, w_i\right)\times q_n\right]}{\sum_n E_z^2\left[c_{us,n}^{\rho}\left(\alpha_j, s_i, w_i\right)\times q_n\right]} = \\ &= \frac{\sum_n \int_{z\in Z_n} z^{2(1-\phi)(1-\rho)} c_{us,n}^{\rho}\left(\alpha_j, s_i, w_i\right)\times q_n dF(z)}{\sum_n \int_{z\in Z_n} z^{2\phi(1-\rho)} c_{us,n}^{\rho}\left(\alpha_j, s_i, w_i\right)\times q_n dF(z)}\end{aligned}$$

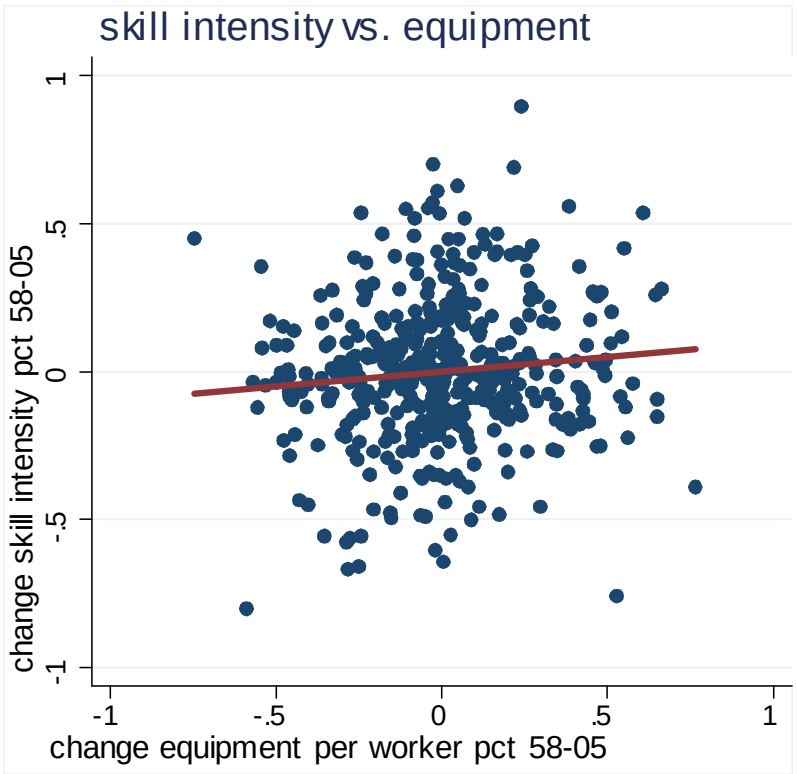
back...

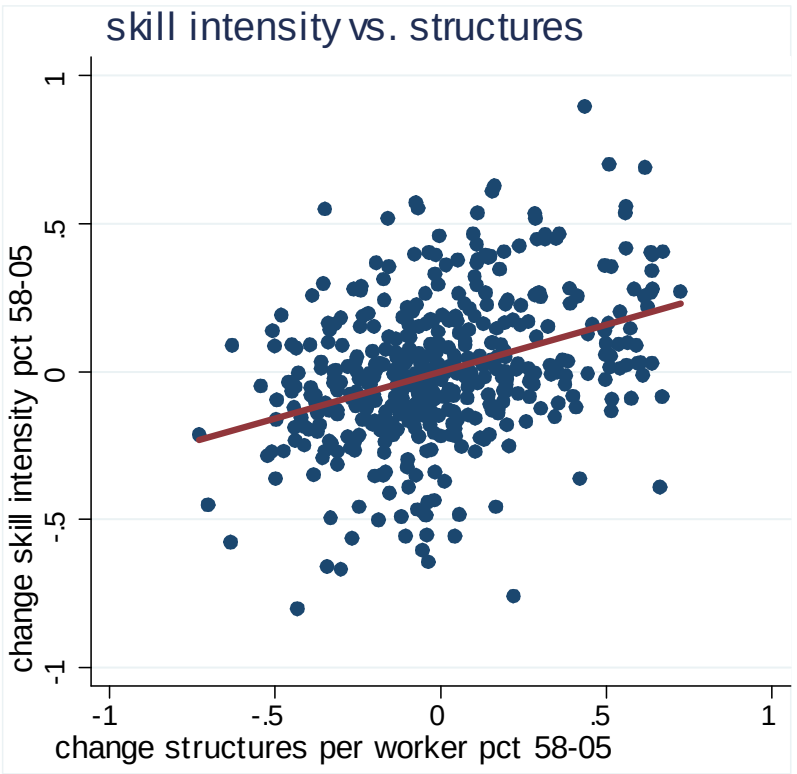
Changes in skill intensity and in capital intensity

- The changes in the ranking seem to be associated to changes in capital per worker:

Equipment vs. structures

- The changes in ranking are
  - well associated to changes in structures per worker
  - not so well associated to changes in equipment per worker (stable w.r.t. trade?)





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Using capital per worker to pin down skill intensity

- Increase in capital per worker 1958-2005 in mfg: about 4.2 times
  - Time variation in NBER prod. dataset should be enough to cover cross-sectional variability in capital per worker

Country n	$(K/wkr)_n / (K/wkr)_{usa}$ in 2005
Indonesia	0.10
China	0.14
Colombia	0.18
Brazil	0.19
Turkey	0.23
Argentina	0.26
Chile	0.30
Mexico	0.33

(computations from PWT, using Hall and Jones 1999)

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