

The Role of Human Capital: Immigrant Earnings

Econ821

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The Idea

How could one measure human capital without knowing the production function?

The problem: we only observe wages

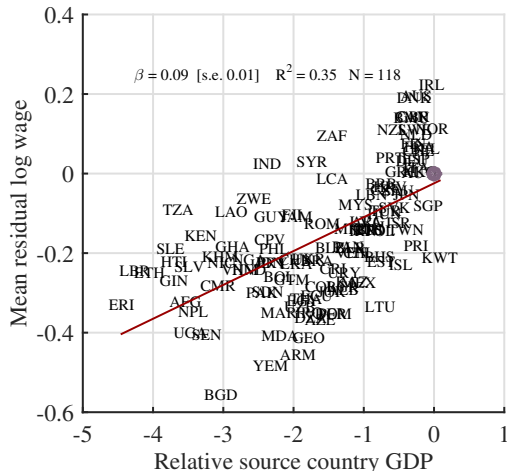
- ▶ $\text{wage} = [\text{skill price}] * [\text{human capital}]$
- ▶ skill prices (unobserved) differ across countries

A simple idea: observe workers from different countries in the same labor market

- ▶ with the same skill prices
- ▶ Hendricks (2002)

Immigrant Earnings in the U.S.

The motivating fact: immigrant earnings do not vary much across rich / poor source countries.



Source: 2010 U.S. Census

Approach

1. run a descriptive wage regression
 - 1.1 LHS: log hourly wage
 - 1.2 RHS: schooling, experience, sex, marital status, ...
2. for each person, compute residual log wage
3. sort workers by country of birth
4. for each country of birth: compute mean residual log wage
5. plot it against relative gdp per worker (PPP, PWT)

Main result:

A 1 log point increase in gdp is associated with a 0.09 log point increase in wages (given characteristics).

Migrant Selection

If migrants are similar to the average worker at home:

- ▶ the graph measures source country human capital relative to the U.S.

Main concern:

- ▶ Immigrants from low income countries are more positively selected than immigrants from rich countries.

Indirect evidence on selection

1. Studies that follow migrants across borders show little selection
 - 1.1 but mostly Latin American countries
2. Return migrants earn roughly the same as never-migrants
3. Refugees earn roughly the same as other migrants
4. For some countries (SLV, JAM), a large fraction of workers migrates to the U.S. at some point
 - 4.1 lots of back and forth migration

Not everyone is convinced ...

Schoellman (2012)

Schoellman (2012)

An extension of the immigrant earnings approach by Schoellman (2012)

The idea: use returns to schooling in the U.S. to measure school quality.

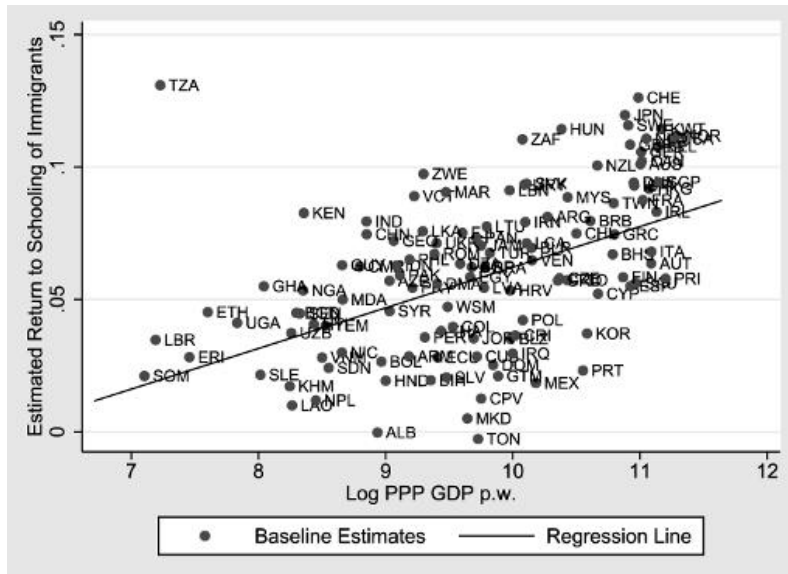
Implementation

- ▶ Run a simple wage regression where coefficient on schooling varies by source country.

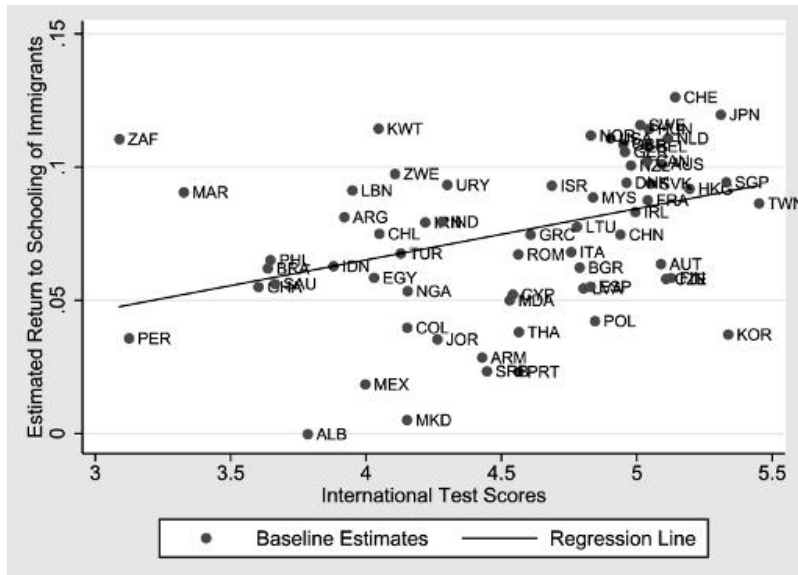
Result:

- ▶ school coefficient varies from 0 (ALB, TON) to 12% (CHE, JPN)

Richer countries have higher returns



Countries with higher test scores have higher returns



What about selection?

Selection could be a problem if immigrants from low income countries are selected to have below average school quality, but above average schooling

- ▶ perhaps a priori not too plausible

Restrict sample to countries with high fraction of refugees (50%+)

Transferability

There really isn't good evidence to rule out that the human capital acquired in low income countries is a poor match for rich country labor markets.

But we are living in a model with only 1 type of human capital.

Accounting Model

Next task: translate school quality differences into output differences.

Aggregate production function:

$$Y_j = A_j K_j^\alpha [h(S_j, Q_j) L_j]^{1-\alpha} \quad (1)$$

Observed:

- ▶ Y_j, K_j : PWT
- ▶ S_j : Barro and Lee (2013)

Human capital production function

$$h(S_j, Q_j) = \exp [(S_j Q_j)^\eta / \eta] \quad (2)$$

This is an invention, due to Bils and Klenow (2000).

We need to estimate Q_j and η .

Then we can construct h for each j and perform levels accounting.

Estimating Q_j

The idea:

- ▶ immigrant returns to schooling reveal Q_j

We want to estimate Q_j by running the regression

$$\ln W \left(S_{US}^j \right) = c + M_{US} \frac{Q_j}{Q_{US}} S_{US}^j \quad (3)$$

In words:

- ▶ Run a Mincer regression with country specific returns to schooling
- ▶ Then j 's Mincer coefficient is proportional to its Q_j

This is really based on intuition, not a model.

Motivating Model for the Wage Regression

To motivate this regression, we develop a simple model.

Workers maximize lifetime earnings:

$$\max_S pvEarn - sCost \quad (4)$$

where

$$pvEarn = h(S, Q_j) \int_{\tau+S}^{\tau+T} e^{-r_j t} w_j(0) e^{g_j t} dt \quad (5)$$

$$sCost = \int_{\tau}^{\tau+S} e^{-r_j t} \lambda_j w_j(0) e^{g_j t} h(t - \tau, Q_j) dt \quad (6)$$

They take Q_j as given.

The cost of schooling is proportional to foregone earnings.

Optimal Schooling

Optimal schooling satisfies

$$S_j = \left[Q_j^\eta / M_j \right]^{1/(1-\eta)} \quad (7)$$

where

$$M_j = \frac{(r_j - g_j)(1 + \lambda_j)}{1 - \exp[-(r_j - g_j)(T - S_j)]} \approx (r_j - g_j)(1 + \lambda_j)$$

Claim: M_j is the Mincer return in country j .

- ▶ This is a bit fishy b/c in the model everyone is the same (no variation in S).
- ▶ Not clear what is supposed to change to induce changing S (likely Q) within a country

Some poorly explained messing around with the equilibrium wage in the US then yields the desired regression equation.

Now we have Q_j as a function of M_j (roughly the same everywhere) and S_j .

Estimating η

The idea:

Use the equilibrium schooling equation

$$\ln S_j = \frac{\eta}{1-\eta} \ln Q_j + \frac{1}{1-\eta} \ln M_j \quad (8)$$

Set $M_j = \bar{M}$ based on estimated Mincer regressions.

Instrument Q_j with test scores.

Development Accounting

Main result: Quality differences are as important as school quantity differences.

	This paper			Literat
	$\eta = 0.42$	$\eta = 0.5$	$\eta = 0.58$	Hall and Jones (1999)
h_{90}/h_{10}	6.3	4.7	3.8	2.0
$\frac{h_{90}/h_{10}}{y_{90}/y_{10}}$	0.28	0.21	0.17	0.09
$\frac{\text{var}[\log(h)]}{\text{var}[\log(y)]}$	0.36	0.26	0.19	0.06

Comments

The empirical idea is quite nice:

- ▶ use immigrant returns to schooling as a proxy for source country school quality

Quantitatively, it's a bit hard to make this work

We run again into the two issues that plague the entire literature:

1. What is the production function for h ?
2. How do deal with migrant selection?

The only clear way out (I think): direct measures of migrant selection

NIS Data

NIS data

This is based on Hendricks and Schoellman (2016).

The idea:

- ▶ a direct measure of the importance of things other than human capital: the wage gain experienced by migrants
- ▶ migrants take their h with them, but leave capital and tfp behind.

This deals with selection: we observe the same worker in 2 labor markets.

Accounting Model

Aggregate production function:

- ▶ $Y_c = K_c^\alpha [A_c H_c]^{1-\alpha}$
- ▶ $y_c = Y_c/L_c = (K_c/Y_c)^{\alpha/(1-\alpha)} A_c h_c = z_c h_c$

Contribution of h to output gaps: $h_{c'}/h_c$.

Share of output gap due to h :

$$share_h = \frac{\ln(h_{c'}/h_c)}{\ln(y_{c'}/y_c)} \quad (9)$$

Migrant wage gains

Observed wage: $w_c = (1 - \alpha) z_c h_c$

Wage gain: z_{US}/z_c

- ▶ directly measures the contribution of h to output gaps

NIS data

New Immigrant Survey

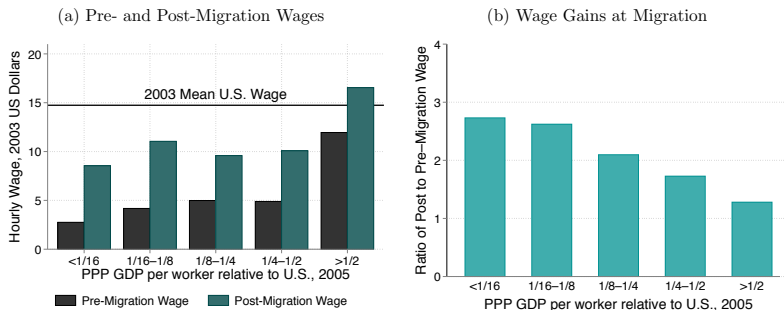
12,000 new permanent residents in 2003

- ▶ About half are new arrivals
- ▶ The others are adjustments of status

Data on:

- ▶ jobs and wages pre and post migration
- ▶ demographics: age, sex, schooling
- ▶ visa status

Results: Pre- and post migration wages



Key: wage gains are small relative to output gaps.

Example:

- ▶ Output gap 21
- ▶ Wage gain 3
- ▶ Contribution of h : $\ln(7)/\ln(21) = 0.64$

Main Result

Table 2: Implied Human Capital Share in Development Accounting

GDP p.w. Category	Human Capital Share	95% Confidence Interval	N
$< 1/16$	0.71	(0.64, 0.78)	178
$1/16 - 1/8$	0.61	(0.57, 0.66)	415
$1/8 - 1/4$	0.58	(0.48, 0.67)	295
$1/4 - 1/2$	0.52	(0.34, 0.70)	168
$> 1/2$	0.83	(-0.11, 1.76)	299

Main result:

h accounts for 2/3 of output gaps!

Robustness

Contribution of h is similar for:

- ▶ different visa categories (H1B, family visas,...)
- ▶ different school levels
- ▶ recent / non-recent arrivals

Why so different from previous research?

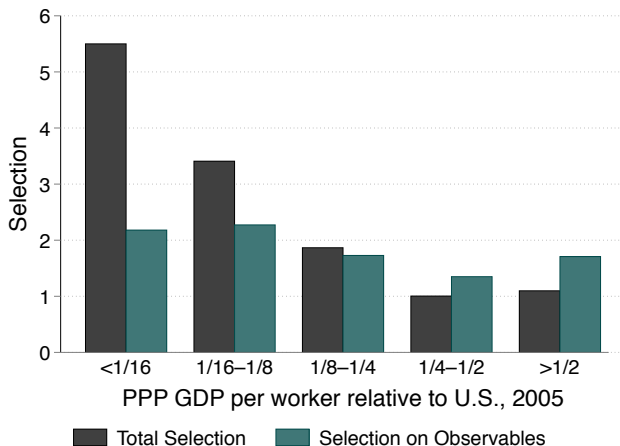
Migrant selection is massive

- ▶ average years of schooling: > 13 (even for poor countries)
- ▶ typical pre-migration occupations: white collar
- ▶ no migrants that previously worked in ag

Pre-migration wages are much higher than average source country wages.

Migrant selection

Figure 4: Selection of Immigrants by GDP per worker



Interpretations

Migrants are very different from the typical worker.

If wage gains are similar for people with low schooling / self-employed / people in ag:

- ▶ then wage gains are small relative to gdp gaps
- ▶ h accounts for more than half of output gaps

Key question:

Do wage gaps between the kinds of people we see in NIS and typical workers reflect human capital or barriers?

References I

- Barro, R. J. and J. W. Lee (2013): "A new data set of educational attainment in the world, 1950–2010," *Journal of Development Economics*, 104, 184 – 198.
- Bils, M. and P. J. Klenow (2000): "Does Schooling Cause Growth?" *The American Economic Review*, 90, 1160–1183.
- Hendricks, L. (2002): "How Important Is Human Capital for Development? Evidence from Immigrant Earnings," *The American Economic Review*, 92, 198–219.
- Hendricks, L. and T. Schoellman (2016): "Human Capital and Development Accounting: New Evidence From Immigrant Earnings," Mimeo. University of North Carolina.
- Schoellman, T. (2012): "Education quality and development accounting," *The Review of Economic Studies*, 79, 388–417.