

# Human Capital, Migration, and Regional Income Convergence in the Philippines

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## Questions

- Do real income converge across Philippine regions?
- Why or Why not?
  - e.g. technological transfer
  - capital accumulation
  - capital movement
  - migration
  - human capital movement

## Focus

- Human capital and its accumulation
- Migration of population and human capital across regions

## Data

- Per capita real GRP (Gross Regional Products) 13 regions every 5 years over the 1980-2000 period.
- ASY (Average Schooling Years)

$$ASY = \sum_{i=1}^6 Duration_i * PopShare_i$$

PopShare(i): Fraction of population for which the ith level of schooling is the highest attained.

## Data

- Net Migration Rate: 1875-80, 1985-90

$$Net\ Migration_i = \frac{\sum_{j \neq i} Migration_{i,j} - \sum_{i \neq j} Migration_{j,i}}{Pop_i}$$

Migration(i,j): Number of people who move from region j to region i.

- Net Inflow of Human Capital: 1975-80, 1985-90

$$Net\ Inflow\ of\ Human\ Capital_i = \frac{\sum_{j \neq i} (Migration_{i,j} * ASY_j) - (\sum_{i \neq j} Migration_{j,i}) * ASY_i}{Pop_i * ASY_i}$$

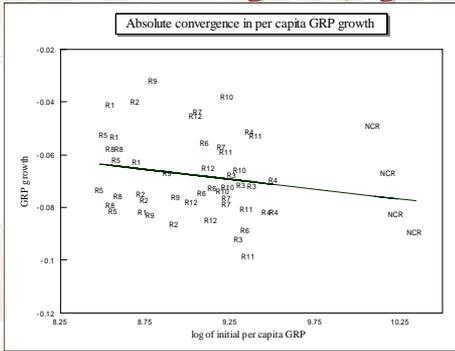
## Absolute Convergence

- Do all the regions tend to move towards the same steady state?

$$\ln\left(\frac{q_{i,t}}{q_{i,t-1}}\right) = \alpha + \beta \ln(q_{i,t-1}) + \sum_r \delta_r DUM_{r,t} + u_{i,t}$$

- = -0.008 (-1.492) (Table2, Column 1)

## Absolute Convergence (Figure 2)



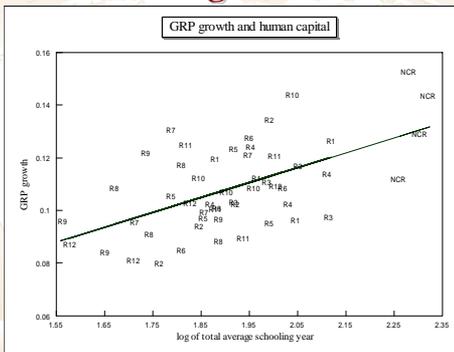
## Convergence Conditional on Human Capital

- Do human capital and its accumulation affect the steady state income level?
- Do regional incomes converge when human capital levels are controlled for?

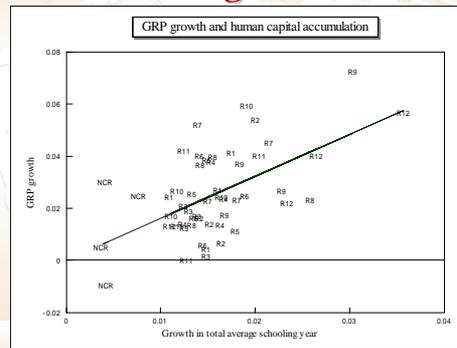
$$\ln\left(\frac{q_{i,t}}{q_{i,t-1}}\right) = \alpha + \beta \ln(q_{i,t-1}) + X_{i,t-1}\lambda + \sum_t \delta_i DUM_t + u_{i,t}$$

- Table 2, Column 2
- (Human capital)=0.057(2.230)
- (Growth in human capital)=1.613(3.483)
- (Initial income)=-0.011(-1.772):
- Speed of convergence=1.1% per annum

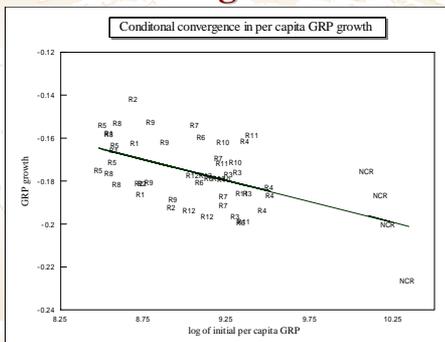
## Figure 3



## Figure 4



## Figure 5



## Convergence Conditional on Physical Capital Investment

- Table 2, Column 4
- (Equipment Investment)=0.034(0.466)
- (Initial income)=-0.006(-0.762)

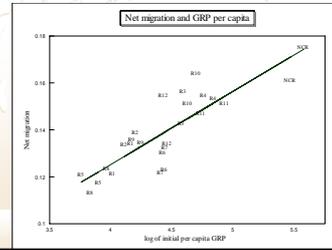
## Migration and Human Capital

- If human capital is the same across regions, migration from poor to rich regions tends to shrink regional disparities in income.
- If migrants are highly educated and if human capital has positive external effects, migration may widen regional disparities in income.

## Determinants of Migration

$$NetMigration_{i,t} = \alpha + \beta \ln(q_{i,t}) + \gamma Density_{i,t} + \delta CrimeRate_{i,t} + \eta DUM_{i,t} + \varepsilon_{i,t}$$

- =-0.031 (10.19) (Table 3, Column 1)



## Direct effect of migration on growth

$$\ln\left(\frac{q_{i,t}}{q_{i,t-1}}\right) = \alpha + \beta \ln(q_{i,t-1}) + X_{i,t-1}\lambda + \sum_t \delta_t DUM_t + u_{i,t}$$

- Table 4, Column 1
- (net migration)=0.167 (0.807)

## Migration and Human Capital

$$\Delta ASY_{i,t} = \alpha + \beta NetMigration_{i,t-1} + \gamma \ln(ASY_{i,t-1}) + \delta DUM_t + \varepsilon_{i,t}$$

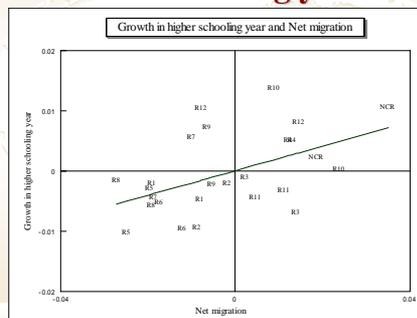
- Table 5
- Total schooling years: =-0.074(1.318)
- Primary schooling years: =-0.304(2.840)
- Secondary schooling years: =-0.263(-2.315)
- Higher schooling years: =-0.204(2.356)

## Migration and Human Capital

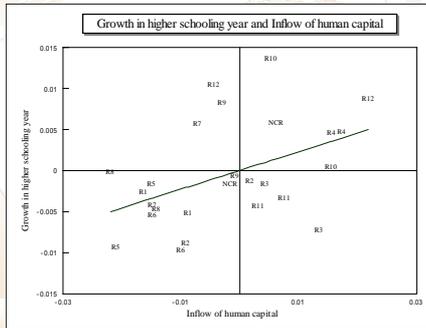
### Interpretation

- (1) Educational levels of migrants are higher than those of original inhabitants.
  - (2) Original inhabitants who live with more migrants tend to attain a higher level of education.
  - (3) Migrants are likely to go to the regions where growth in human capital and hence in income is high.
- Given that net migration variable is the 5-year lagged value, (1) is most likely.

## Effects of migration on higher schooling years



## Effects of migration on higher schooling years



## We have found...

- No absolute convergence
- Convergence conditional on human capital
- Positive effects of human capital and its accumulation on growth
- Migration from poor to rich regions
- Migration of highly educated people

## Conclusion

- Migration of highly educated people from poor to rich regions enhances the human capital level of the host regions, which may result in persistent income disparities across regions due to the externality of human capital.