How Much do Educational Outcomes Matter in European Union Countries?

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Effective policies for the development of competencies of youth in Europe
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Plan for Discussion

• School quality and economic growth
  - Cognitive skills
  - Early versus late investment

• Special policy considerations
  - Basic skills v. advanced skills
  - Tertiary education

• Some policy options
Human Capital in Empirical Growth

• Simple cross-country growth regressions
  - Enrollment rates

• Wide variety of measurement alternatives
  - Literacy
  - School enrollment and attainment
Years of Schooling and Long Run Economic Growth

coef = 0.581, se = 0.095, t = 6.10
Human Capital in Empirical Growth

- Simple cross-country growth regressions
  - Enrollment rates

- Wide variety of measurement alternatives
  - Literacy
  - School enrollment and attainment

- Cognitive skills
  - Measuring knowledge, not sitting in the classroom
  - International tests of students’ performance in cognitive
    - 12 testing occasions, 36 separate test observations (age levels, subjects)
Cognitive Skills and Economic Growth

\[ \text{coef} = 1.980, \text{ se} = 0.217, t = 9.12 \]
Years of Schooling and Economic Growth

Without quality control

With quality control
Rocket Scientists or Basic Education for All?

• Should policy concentrate on lowest or highest achievers?
Selected Examples of the Distribution of Student Performance

- **BEL**
  - Mean: 529
  - Median: 537

- **DEU**
  - Mean: 503
  - Median: 510

- **FIN**
  - Mean: 544
  - Median: 543

- **USA**
  - Mean: 483
  - Median: 483
Rocket Scientists or Basic Education for All?

• Should policy concentrate on lowest or highest achievers?
  - BOTH seem important
  - Rocket scientists more important in developing countries

• Does more tertiary education make sense?
  - Frontier vs. off-frontier
  - No evidence for developing or developed after considering cognitive skills
Estimating the Value of School Reform

- Reform that increases achievement
  - 20 years to reach new levels

- Assume future growth like 1960-2000 growth
  - Holds for former communist members

- Discount future at 3 percent

- Growth without education reform at 1.5 percent

- Calculate present value over lifetime of person born today
  - 80 year expected life
  - 40 year working life
Growth Projections

- Scenario 1
  - Achievement improves by 25 points (1/4 s.d.)
Annual Gains from 25 PISA Points Improvement

Percent addition to annual GDP vs Year

2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110
Annual Gains from 25 PISA-Points Improvement

Percent addition to annual GDP vs. Year

- Y-axis: Percent addition to annual GDP
- X-axis: Year (2010 to 2110)

The graph shows a trend where the percent addition to annual GDP increases over time, peaking in the year 2090.
Growth Projections

- Scenario 1
  - Achievement improves by 25 points (1/4 s.d.)
    - $PV = 288\%$ of current GDP
    - 6.2\% of present value of GDP 2010-2090
    - €35T for European Union
Growth Projections

• Scenario 1
  - Achievement improves by 25 points (1/4 s.d.)

• Scenario 2
  - Everybody Achieves at Level of Finland
    - PV = 785% of current GDP in EU-27
    - 16.8% of present value of GDP 2010-2090
    - €95 trillion for European Union
Present Value of Added GDP from Increasing to the Achievement of Finland (% of current GDP)
Present Value of Added GDP from Increasing to the Achievement of Finland
Growth Projections

• Scenario 1
  - Achievement improves by 25 points (1/4 s.d.)

• Scenario 2
  - Everybody Achieves at Level of Finland

• Scenario 3
  - Less than 15% at Level 1 or below (basic skills)
    - $PV = 211\%$ of current GDP in EU-27
    - 4.5% of present value of GDP 2010-2090
    - €25 trillion for European Union
Present Value of Europe 2020 Literacy Benchmark:
Less than 15% Below Level 1 (% current GDP)
Present Value of Europe 2020 Literacy Benchmark:
Less than 15% Below Level 1
Do Skills Cause Growth?

• Simple reverse causation

• Omitted factors
  - Institutions (openness, property rights)
  - Regulations
Trends in Test Scores
Trends in Growth Rates vs. Trends in Test Scores
Policy options

• Spending
Resources and Performance across Countries

Math performance in PISA 2003

Cumulative educational expenditure per student

- Mexico
- Slovakia
- Poland
- Hungary
- Ireland
- Korea
- Switzerland
- Belgium
- Canada
- Canada
- Denmark
- Austria
- Norway
- USA
- Italy
- Greece
- Finland
- Netherlands
- Sweden
- Sweden
- Germany
- France
- Portugal
- Spain
- Portugal
- Finland
- Netherlands
- Sweden
- Sweden
- Germany
- France

$R^2 = 0.01$

$R^2 = 0.15$
Policy options

- Spending
- Teacher quality
Teacher Quality

• Strongest evidence on systematic effects

• Not related to common measures

• Observable through both student performance and supervisor ratings
Policy options

- **Spending**
- **Teacher quality**
- **Institutional changes**
  1. Competition and choice (private schools)
  2. Accountability (central exit exams)
  3. Autonomy
  4. Teacher performance pay
  5. Pre-primary education system
How Autonomy Affects Student Performance
— Depending on Given Incentives —

• School autonomy
  1. Use of superior local knowledge
  2. Opportunistic behavior

• School autonomy may be good or bad

• Complementary institutions
How Central Exams Change Behavior — Thus Changing the Effects of Autonomy —

- Central exams provide *information*
- Central exams ease the monitoring
- By introducing accountability, central exams ease the “bad” effects of autonomy, ensuring a “good” net effect
Central Exams, School Autonomy, and Student Performance

Math test score

School autonomy over teacher salaries

TIMSS + TIMSS-R
Conclusions

- Europe 2020
  - Correct to emphasize human capital development
  - Incorrect to headline quantity
    - Reduce dropouts to less than 10 percent
    - 40 percent of 30-34 year olds with tertiary education

- Early versus late investment strategies

- Vocational v. general education

- Huge benefits to quality

- Must deal with myopic pressures of fiscal problems