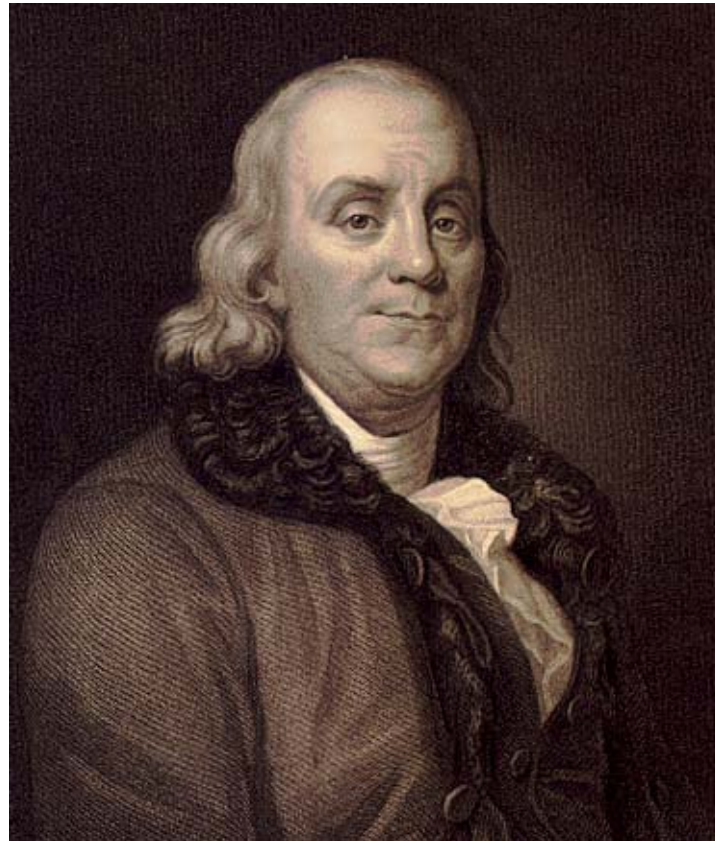
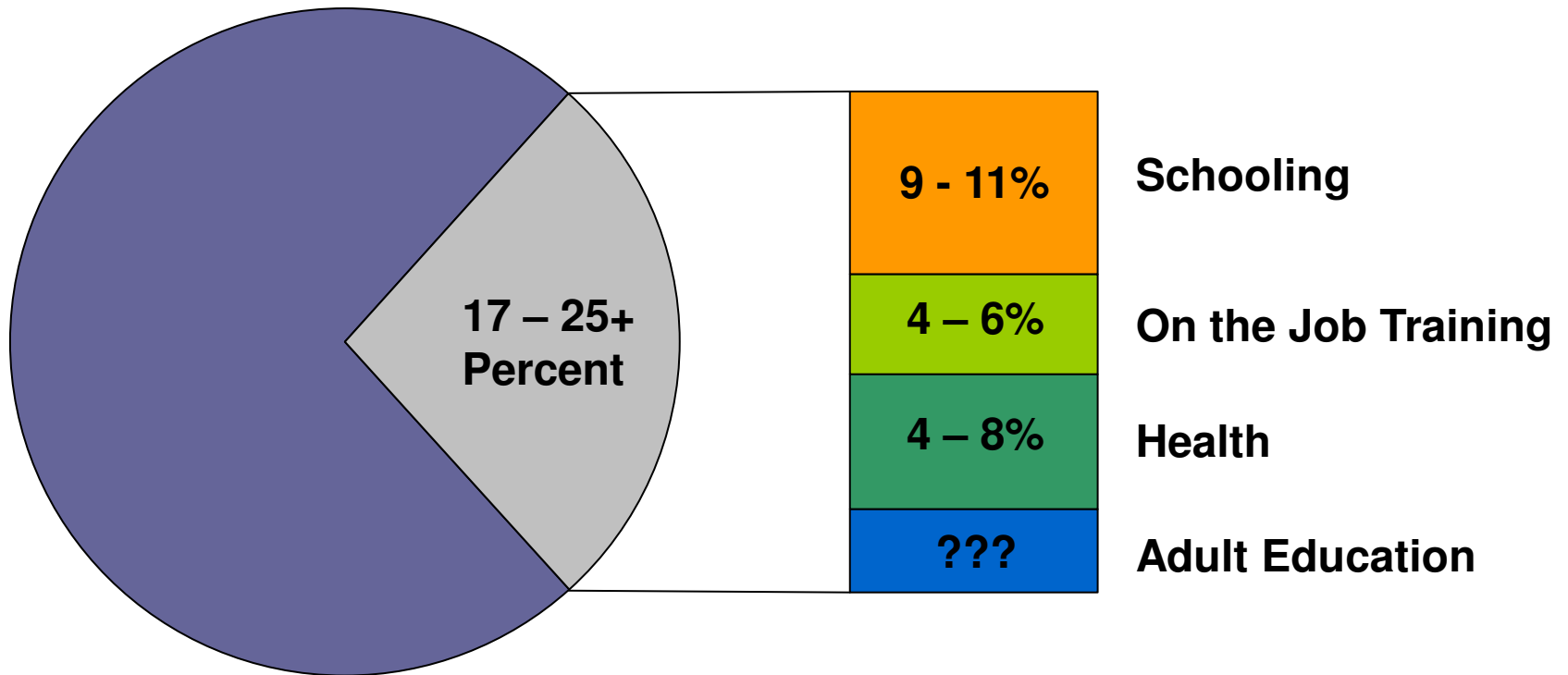

Human Capital in the 21st Century

Gary S. Becker
Santiago, Chile
December 4, 2007

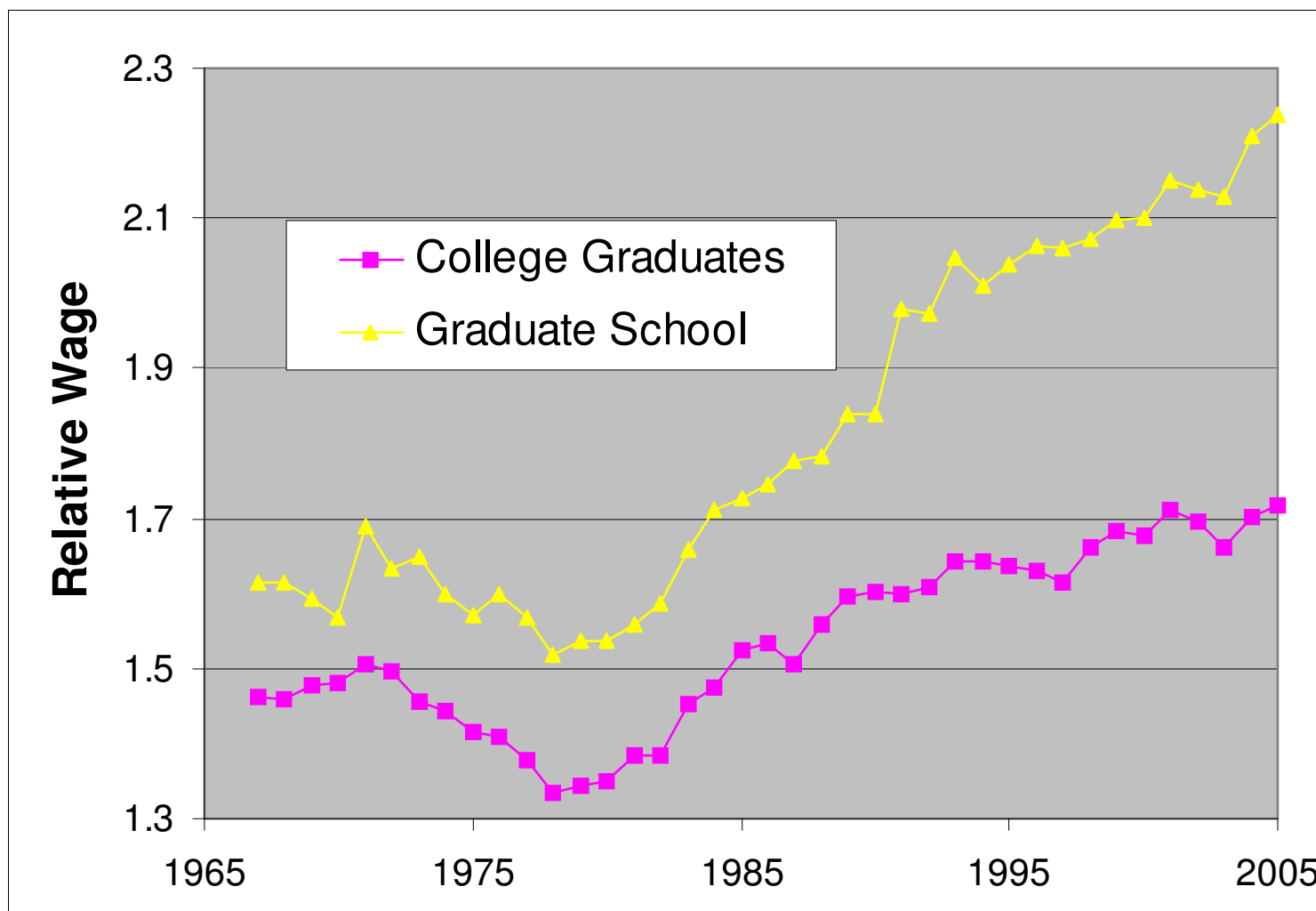
An Investment in Knowledge Pays the Best Interest



Investment in Human Capital as a Percent of GDP United States

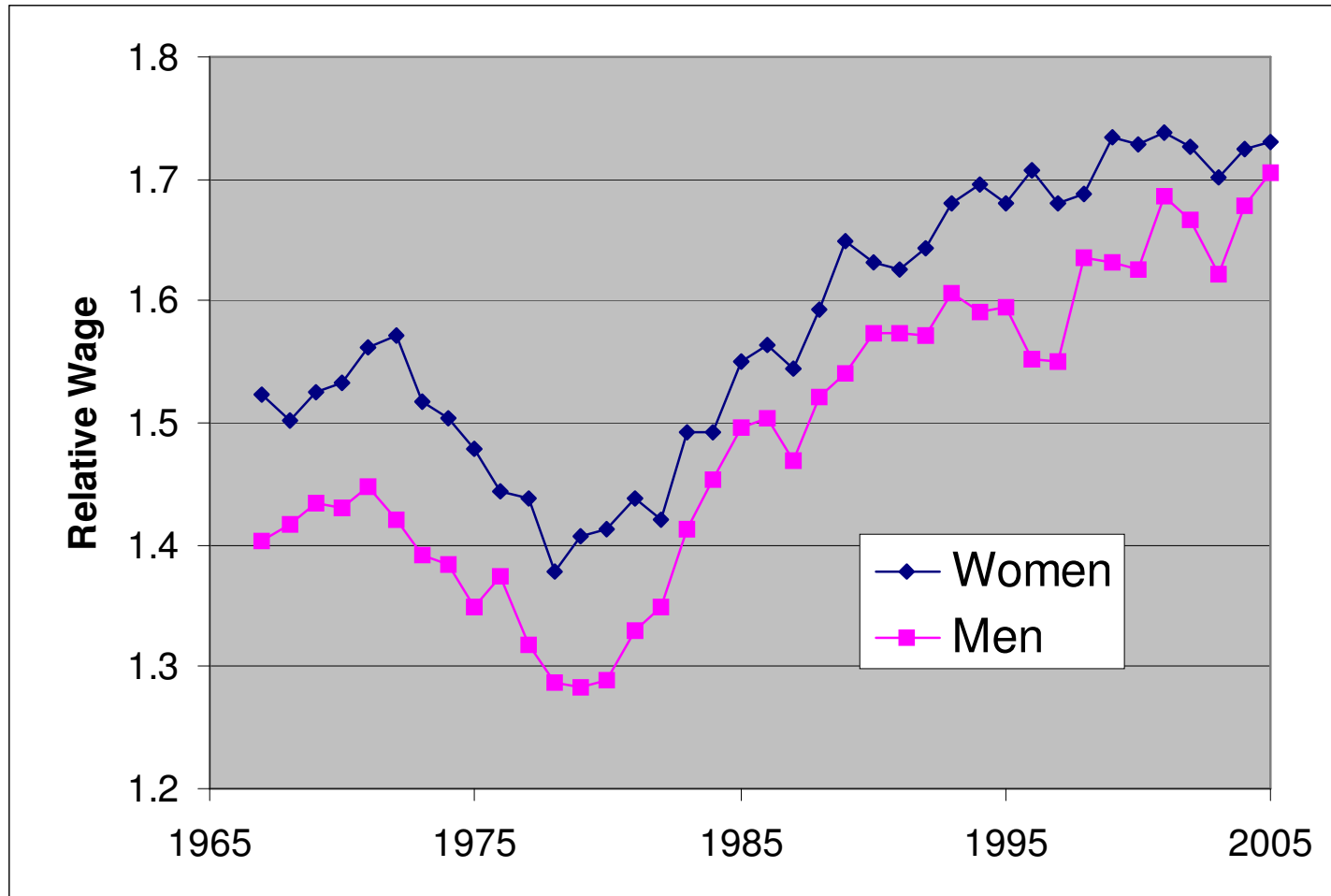


Education Wage Premiums- United States



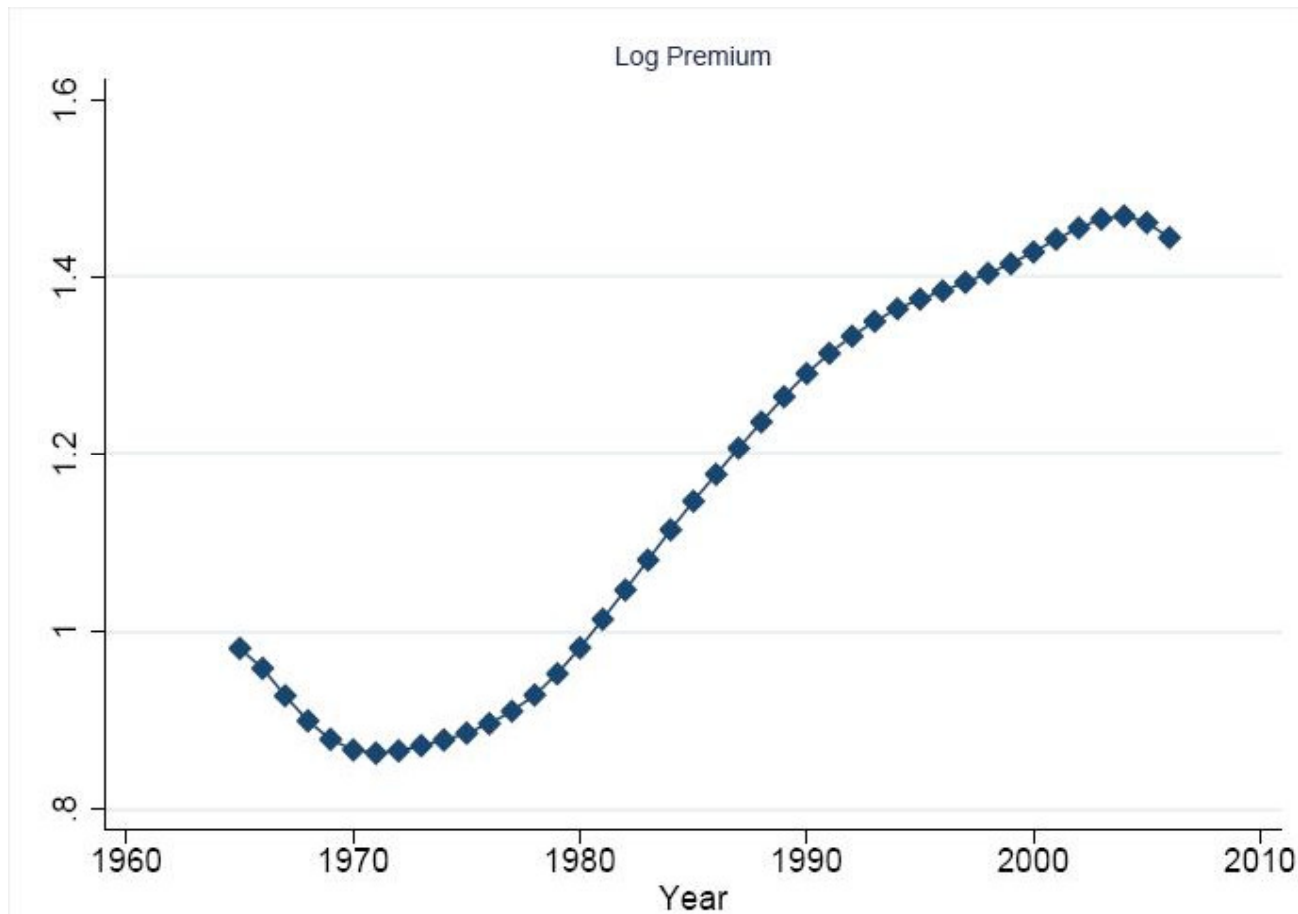
Source: Calculations by Kevin M. Murphy

Education Premiums by Gender- United States



Source: Calculations by Kevin M. Murphy

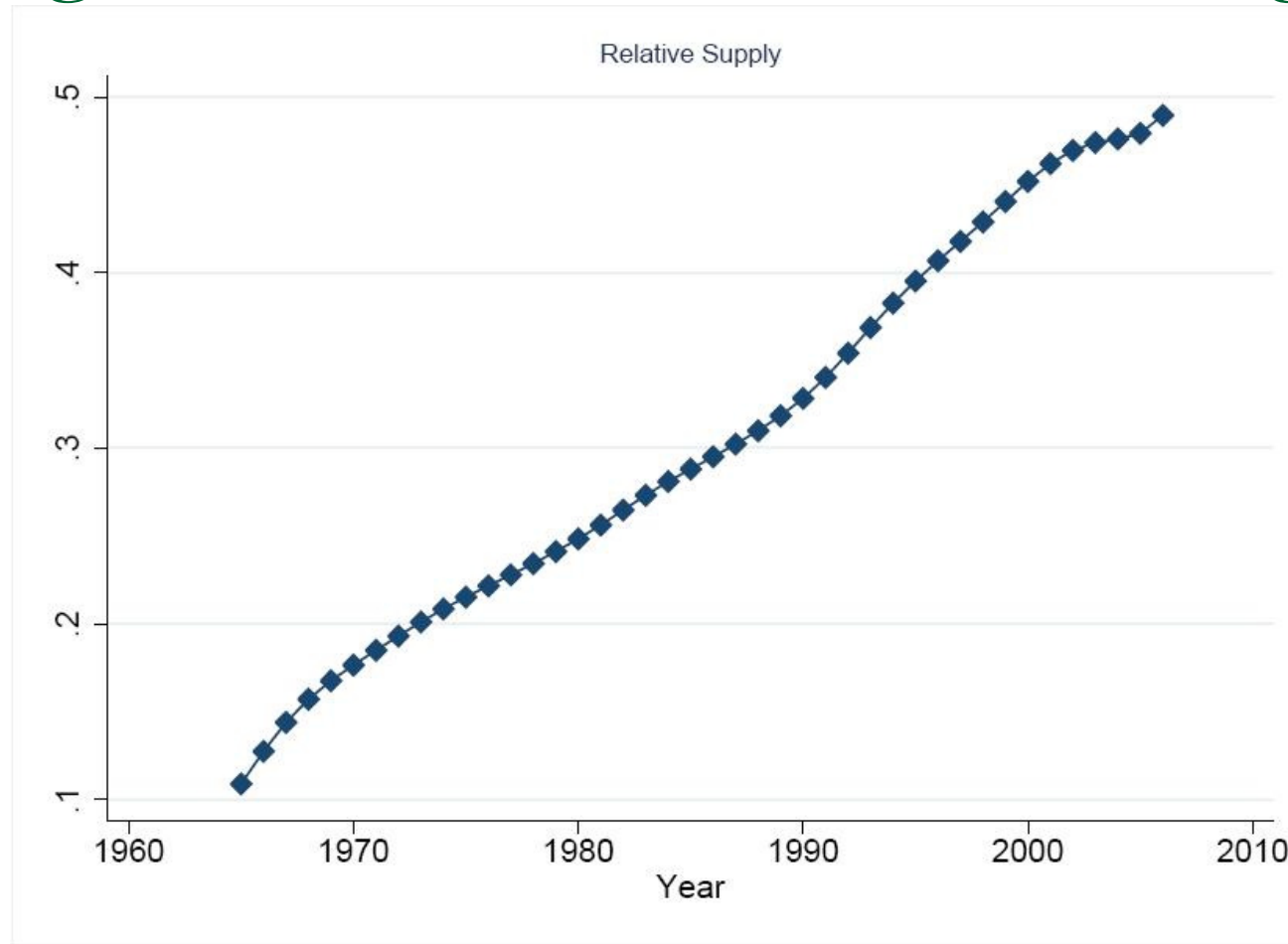
College-High School Wage Premium- Santiago



Note: Premium is calculated for males between 25 and 60 years old that work more than 30 hours per week.

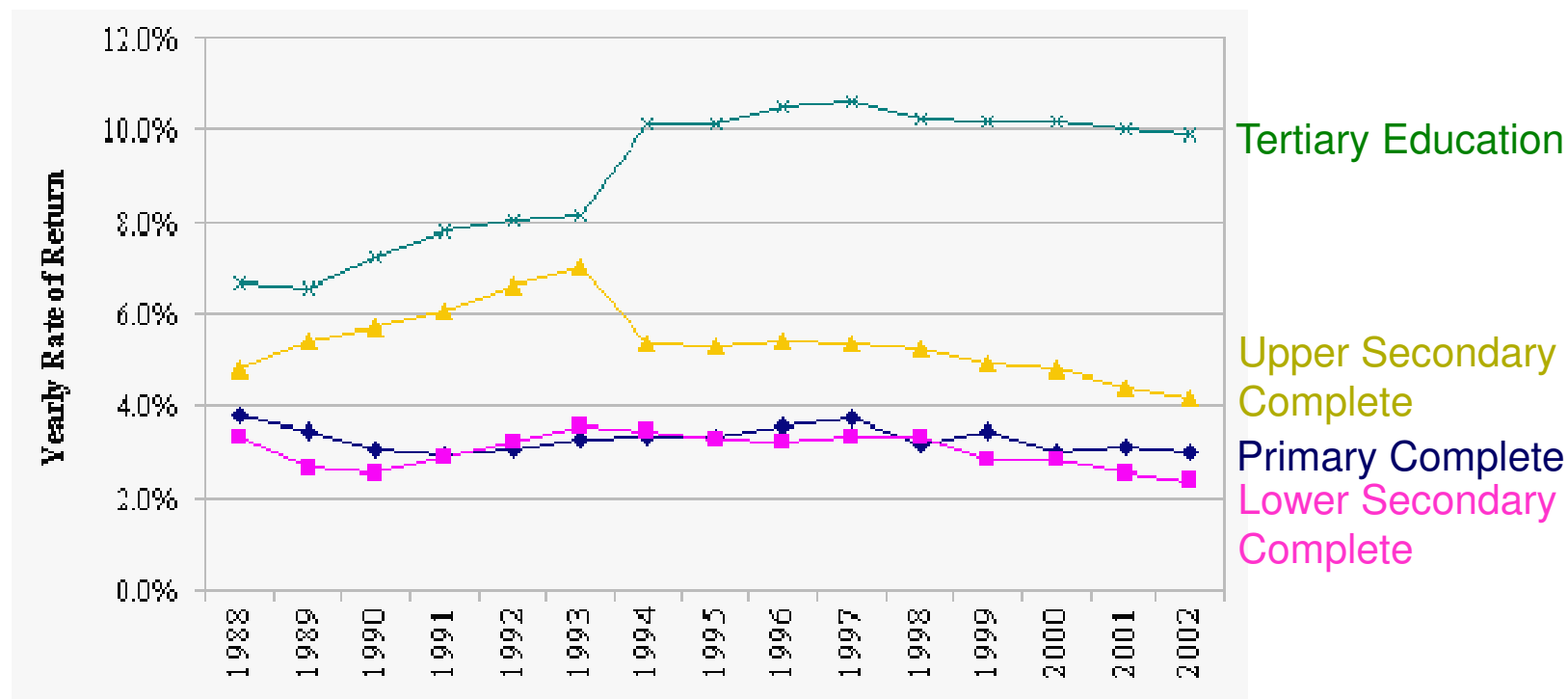
Source: Puentes, 2007

Relative Supply of College Graduates to High School Graduates- Santiago



Source: Puentes, 2007

Yearly Rates of Return to Education Level Mexico, Urban Areas, 1988-2002



Source: WB staff estimations using third quarter of ENEU from 1988 to 2001 and third quarter and urban section of ENET 2002.

Returns to Education- China

1988, 2000

| Year | Sample | Rate of Return to Education | Adjustment for Income Growth in Future |
|-------------|---------------|------------------------------------|---|
| 1988 | Urban | 3.3% | 9.3% |
| 2000 | Urban | 11.1% | 17.1% |

Sources: 1988: Johnson, Emily N., and Chow, Gregory C. (1997). 2000: Heckman and Li (2003).

World Knowledge Indicators

| World knowledge Indicators | Now | Then | |
|---|-----------------|----------------|------|
| College degree holders, total | 212 million | 82 million | 1980 |
| Share of population, ages 25+ | 9.1% | 5.3% | 1980 |
| Bachelor's degree graduates | 9.1 million | 4.3 million | 1981 |
| Doctoral degree graduates | 293,085 | 114,808 | 1983 |
| Science and engineering doctorates | 154,710 | 57,217 | 1983 |
| Science and engineering doctorates in China | 10,096 | 125 | 1985 |
| College professors worldwide | 8.5 million | 3.8 million | 1980 |
| Think tanks | 318 | 160 | 1980 |
| R&D researchers | 5.1 million | 1.9 million | 1985 |
| R&D spending | \$667 billion | \$276 billion | 1981 |
| Scientific articles published | 698,726 | 466,419 | 1988 |
| Human genome base pairs decoded | all 3.1 billion | 0 | 1990 |
| Wikipedia articles | 5.3 million | 0 | 2001 |
| Patent applications | 1.1 million | 701,151 | 1985 |
| Licensing revenue | \$109.8 | \$10.8 billion | 1980 |

Information Infrastructure and Use

| Information Infrastructure and Use | Now | Then | |
|--|-----------------|----------------|------|
| Personal computers | 898 million | 131 million | 1990 |
| per 1,000 people | 140 | 19 | 1990 |
| Landline phones | 1.2 billion | 333 million | 1980 |
| per 1,000 people | 217 | 75 | 1980 |
| Cell phones | 2.7 billion | 11.2 million | 1990 |
| per 1,000 people | 416 | 2 | 1990 |
| Countries connected to the Internet | 209 | 20 | 1990 |
| Secure Internet servers | 401,050 | 0 | 1990 |
| Internet web sites | 110 million | 9,300 | 1990 |
| Host computers connected to the Internet | 395 million | 313,000 | 1990 |
| Internet storage (terabytes) | 532,897 | 0 | 1990 |
| Semiconductor sales | \$248 billion | <\$1 billion | 1980 |
| IT capital stock (U.S.) | \$1.05 trillion | \$16.7 billion | 1980 |
| Digital video recorders | 17.4 million | 0 | 1990 |

Causes of rising returns?

- Technological progress biased toward skilled workers
 - Increased supply of physical capital
 - Globalization
 - Technologies advances have long waves
-

Role of Women

- 21st century economies more friendly to women
 - Women's education will exceed men's
 - Women's earnings are rising relative to men
 - Enter into occupations and fields like science, engineering, medicine far more than in the past
 - Chart shows trend
-

Inequality

- IMF recent study shows inequality rose in many countries since 1980
 - Educated persons did relatively well, even in developing countries
 - Cause in these countries is FDI and technological transfers
-

Economic Growth

- Human capital is an important engine of growth
 - No country can grow with inferior investment in human capital
 - Other changes needed
-

Including interaction with rest of economy

- Flexible labor markets
 - Flexible product markets
 - Easy to start business
-

Education

- Better education for children from poorer families
 - More competition through vouchers, charter school
 - Chile's experience with vouchers looks good in recent evaluations, although far from perfect
-

Conclusions

- As we look to the cause of growth in the 21st century, human capital will be even more important than in the 20th century because of the rising importance of knowledge
 - This means we do not need an abundant supply of oil, other natural resources to prosper
 - People, not natural resources or even machines, will determine prosperity
 - Countries that invest in its people will grow and succeed
 - This is an attractive economic view, and a humanitarian one too
-