Global Trends:
Privatization of Higher Education Leading to Cuts in The External Social Benefits

Effects On Family, State, National, and Global Development

Center for Global Studies
January 22, 2019
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Globally: Privatization of Higher Education
• Today Human Capital Plays the Central Role in Growth and Development
• Yet privatization proceeding in US, UK, Canada, Germany, India, Malaysia, …
• OK for steel mills: but HE? Social benefits are crucial to development!!
• The external social benefits tend to be cut first
• I show here that development slows
My Endogenous Development Model

Analytic proof that:

• Per Capita Efficient Rate of Development is higher with social benefit externalities
• Than in a competitive economy, with privatization, and hence few externalities!
• Also true for pure economic growth rate.
## Table 1
### Value of External Social Benefits
Per Year, Per Capita, 2016 Dollars

<table>
<thead>
<tr>
<th>Social Benefits</th>
<th>Bachelor’s</th>
<th>Associate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy, Civic Institutions (Rule of Law, Political Stability)</td>
<td>$7,252</td>
<td>$2,556</td>
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<tr>
<td>Lower Crime, Prison, and Justice System Costs</td>
<td>$14,490</td>
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<tr>
<td>Cleaner, More Sustainable Environment</td>
<td>$8,955</td>
<td>$3,156</td>
</tr>
<tr>
<td>Additional State and National Income Taxes Paid</td>
<td>$3,824</td>
<td>$989</td>
</tr>
<tr>
<td>New Ideas &amp; Adaptations , Technical Change ! PhD’s: Very LARGE</td>
<td>Large</td>
<td>Positive</td>
</tr>
<tr>
<td><strong>Total Value of Direct Social Benefits</strong></td>
<td><strong>$34,521</strong></td>
<td><strong>$11,809</strong></td>
</tr>
<tr>
<td><strong>As a Percent of Earnings Increments</strong></td>
<td><strong>107%</strong></td>
<td><strong>104%</strong></td>
</tr>
</tbody>
</table>
The Central Message

Social Benefits Contribute Significantly to Higher Rates of Growth and Development, higher than in a competitive economy with privatization!

- These Externalities Require Public Funding
- Lower Tuition Induces More Private Investment by Families

Currently There is Underinvestment in HE

- for Growth: Return in Earnings: 10.1%/Yr. (for BA), >7.2%,
- for Development: Total Return: 38%, >> 7.2%

Social Benefits: $34,521/graduate/Yr., 104% of Earnings Increment over HS Including indirect benefits; and over time: Many times that!
Policy Options

Community Colleges
- Zero Tuition is Economically Efficient
- Increased Pell Grants is Efficient
- More Public Investment Efficiently Helps Local Development

Public Universities
- Lower Tuition is justified on efficiency grounds
- But Zero 4 Yr. tuition? Debatable.
Discussion
Effect of Each $1 Cut in Investment in Human Capital Formation at Public Universities on the State Budget

Total Costs to Other Parts of the Budget: $0.93 as follows:

- Child Foster Care
- Prisons
- Economic Development
- Welfare & Home Healthcare
- Basic Education (K-12)
- Medicaid
- Tax Revenue

Source: McMahon (2015, Table 2, p. 7)
Introduction and Overview

External Social Benefits of Higher Education
• The *rationale* for public financing

Social Benefits Include
• Democratization, Lower prison costs, Higher income tax receipts, New ideas,…
  Technological Change!
Introduction and Overview (Cont.)

The Model

• *Proves externalities generate higher* rates of development
• *And establishes underinvestment in HE*

Social Benefit Valuations

Conclusion

• *Cuts in Public support lower* growth
• *Jeopardizes future of US and UK*
Theory of Endogenous Development

- The objective function to be maximized for broader development is the sum of the per capita stream of discounted utilities for total consumption, $\bar{c}_t$:

$$\int_0^\infty \frac{1}{1-\sigma} [\bar{c}_t^{1-\sigma} - 1] e^{-rt} dt$$

- Production Function for market goods by firms:

$$Y_t = A \star I_t \left[ K_t^\beta \left( \mu_t h_t N_t \right)^{1-\beta} \right] h_{at}^\gamma, \quad I_t = \alpha h_t^\eta$$

- Household Production of final (education) outcomes:

$$C_{nm} = A \star I_t \left[ C_t^\beta (1-\mu_{1t}h_{1t}) h_t N_t \right] h_{at}^\gamma$$

- Production of Human Capital by Households and HE institutions:

$$\frac{\partial h}{\partial t} = \frac{G_t}{Y_t} \delta [1 - \mu_t] h_t$$
Results

- Form Hamiltonian: \( H (K, h, \Theta_1, \Theta_2, c, c_{nm}, \mu_1, \mu_2, t) \)
  \[= [\text{Future Total Cons. } \bar{c}_t] - \Theta_1 [K_t \text{ Inv}] - \Theta_2 [HC_t \text{ Inv}] = 0 \]

Maximum sustainable per capita development determined by \( r^* \) on physical capital:

\[
\frac{\frac{\partial \bar{c}_t}{\partial t}}{\bar{c}_t} = \frac{\frac{\partial y_t}{\partial t}}{y_t} = MPP_{Kt} - \rho
\]

If total return on higher education is larger than that, there is underinvestment

With positive education externalities, sustainable development rate is larger!

\[
\frac{\frac{\partial \bar{c}_t}{\partial t}}{\bar{c}_t} = \frac{1 - \beta + \eta + \gamma}{1 - \beta} \left( \frac{\frac{\partial h_t}{\partial t}}{h_t} \right)
\]

New ideas endogenous, growth higher! Because \( \eta \) is positive.
The Total Return Includes B, Non-Monetary Social and Private Benefits

- Returns to Education
- Costs
- Age
- Scholarships
- Tuition
- Foregone Earnings
- Earning Years
- Graduation
- Retirement
- Work
- College Earnings Differential
- High School Earnings
- Social Costs
- Work
- Subtracted from Investment
- Non-Monetary Returns

The diagram illustrates the total return from education, including both monetary and non-monetary benefits. It shows the impact of tuition, scholarships, foregone earnings, and college earnings differential. The social costs, such as work, are also subtracted from the total return.
<table>
<thead>
<tr>
<th>Social Benefits</th>
<th>1 Yr.</th>
<th>2 Yrs.</th>
<th>4 Yrs.</th>
<th>Measurement Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy, Civil Institutions</td>
<td>0.0008</td>
<td>0.0016</td>
<td>0.0032</td>
<td>Democracy Index, 1-7</td>
</tr>
<tr>
<td>Human Rights (Judicial)</td>
<td>0.0012</td>
<td>0.0024</td>
<td>0.00054</td>
<td>Human Rights Index, 1-7</td>
</tr>
<tr>
<td>Political Stability</td>
<td>0.003</td>
<td>0.006</td>
<td>0.0135</td>
<td>Political Stability Index, 1-100</td>
</tr>
<tr>
<td>Longer U.S. Life Expectancy</td>
<td>-0.084</td>
<td>-0.168</td>
<td>-0.336</td>
<td>Less Adverse Growth Effect</td>
</tr>
<tr>
<td>Less Inequality?</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Only if Policies Support it</td>
</tr>
<tr>
<td>Poverty Reduction</td>
<td>0.106</td>
<td>0.212</td>
<td>0.424</td>
<td>Poverty Index Increase</td>
</tr>
<tr>
<td>Lower Murder Rates</td>
<td>-1.13</td>
<td>-2.26</td>
<td>-4.52</td>
<td>Less Homicides per 100,000</td>
</tr>
<tr>
<td>Less Other Crimes</td>
<td>-78.9</td>
<td>-157.8</td>
<td>-315.6</td>
<td>Less Other Crimes per 100,000</td>
</tr>
<tr>
<td>Additional Taxes Paid Annually, Present Value</td>
<td>-</td>
<td>[$989]</td>
<td>[$3,824]</td>
<td>Not in Total, in Table 1</td>
</tr>
<tr>
<td>Less Water Pollution (HE Only)</td>
<td>304</td>
<td>608</td>
<td>1,216</td>
<td>Lower Water Pollution Index</td>
</tr>
<tr>
<td>Less Air Pollution (HE Only)</td>
<td>0.125</td>
<td>0.250</td>
<td>0.56</td>
<td>Air Pollution Index</td>
</tr>
<tr>
<td>Less Forest Destruction</td>
<td>0.00005</td>
<td>0.00001</td>
<td>0.00002</td>
<td>Change in Forest Acres, %</td>
</tr>
<tr>
<td>Increased Social Capital</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>Helliwell (2005), No Coef.</td>
</tr>
<tr>
<td>Indirect Effects: Increased Wages of Others</td>
<td>0.32</td>
<td>0.64</td>
<td>1.28</td>
<td>Moretti (2002, P. 28) &amp; McMahon (2002)</td>
</tr>
<tr>
<td>New Ideas &amp; Adaptations</td>
<td>+</td>
<td>++</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>External Social Benefits</td>
<td>Bachelor’s 2016 Dollars</td>
<td>Associate 2016 Dollars</td>
<td></td>
<td></td>
</tr>
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<td>---------------------------------------------------------------</td>
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<td>$8,955</td>
<td>$0</td>
<td></td>
<td></td>
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<tr>
<td>Increased Social Capital</td>
<td>$0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Ideas &amp; Adaptations</td>
<td>?</td>
<td>?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$27,973</td>
<td>$8,207</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$70,185</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$20,592</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>95%</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
The Rationale for Public Support

High Social Rates of Return (2016, Corrected for ability & trend)
For growth: 12.9% Assoc; 11% BA, All >7.2%
For Development: 45% Assoc; 38% BA,
  22% for dropouts. All >7.2%
S&P 500: 7.2% (10 year average)
This is Strong Evidence of Underinvestment!

How Much Public Investment is Justified?
External Social Benefit as a % of the Total:
$30,679/$112,975 = 27% Direct, or
40% including indirect benefits
<table>
<thead>
<tr>
<th>Level Of Education</th>
<th>Unadjusted</th>
<th>Adjusted for Net Ability Bias and Longitudinal Trends</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>9th-12th Grade, No Diploma, Male</td>
<td>4.2%</td>
<td>3.5%</td>
</tr>
<tr>
<td>9th-12th Grade, No Diploma, Female</td>
<td>1.3%</td>
<td>.6%</td>
</tr>
<tr>
<td>High School Graduate, Male</td>
<td>7.1%</td>
<td>6.4%</td>
</tr>
<tr>
<td>High School Graduate, Female</td>
<td>10.5%</td>
<td>9.8%</td>
</tr>
<tr>
<td>College, 1-3 Years, Male</td>
<td>6.4%</td>
<td>5.8%</td>
</tr>
<tr>
<td>College, 1-3 Years, Female</td>
<td>4.2%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Associate Degree (2 Years), Male</td>
<td>13.5%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Associate Degree (2 Years), Female</td>
<td>15.3%</td>
<td>14.1%</td>
</tr>
<tr>
<td>Bachelor’s Degree, Male</td>
<td>11.3%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Bachelor’s Degree, Female</td>
<td>11.6%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Masters Degree (1.5 Years), Male</td>
<td>11.1%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Masters Degree (1.5 Years), Female</td>
<td>6.8%</td>
<td>5.9%</td>
</tr>
<tr>
<td>PhD (5 Years), Male</td>
<td>9.2%</td>
<td>10.4%</td>
</tr>
<tr>
<td>PhD (5 Years), Female</td>
<td>9.6%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Professional (4 Years), Male</td>
<td>14.8%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Professional (4 Years), Female</td>
<td>12.6%</td>
<td>14.1%</td>
</tr>
<tr>
<td>Private NM Benefits</td>
<td>1 Yr.</td>
<td>2 Yrs., Associate</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Own-Health</td>
<td>0.187</td>
<td>0.374</td>
</tr>
<tr>
<td>Better Child Health</td>
<td>0.195</td>
<td>0.390</td>
</tr>
<tr>
<td>Better Spousal Health</td>
<td>0.180</td>
<td>0.360</td>
</tr>
<tr>
<td>Greater Longevity</td>
<td>-0.117</td>
<td>-0.234</td>
</tr>
<tr>
<td>Child Educ, Cognitive Devel’ mt</td>
<td>-0.180</td>
<td>0.354</td>
</tr>
<tr>
<td>Smaller Family Size</td>
<td>-</td>
<td>-0.360</td>
</tr>
<tr>
<td>Increased Happiness</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HH Consumption Efficiency</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Better Asset Management</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Location, Work Amenities</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lifelong Learning</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Estimated t-Statistics all at 0.5 to 0.1 Level; See Text
Valuing Non-Market Outcomes Estimate
Based on cost of producing outcome by other means

Regression: \[ Z = \alpha Y + \beta E + \ldots + u \]

Equate ratios of MPP to Price: \[ P(E) = \frac{\beta}{\alpha} \cdot P(X) \]

- **Valuing of Education’s Contribution to Health**
  \[ P(E) = 0.187 \cdot ($1,000)(\Delta CPI) = $16,800 \]

  \[ P(X) \text{ of 1 Unit Own-Health which is a +10% increase in Health:} \]
  Takes 3 Doctor’s Visits + Drugs = $1,000
  Cross check using regressions: \[ 1 = 0.001 \cdot \Delta Y, \Delta Y = $1,000 \]

- **Valueing Contribution to Democratization**
  \[ P(E) = \frac{\beta}{\alpha} \cdot (\Delta Y) = 0.00096 \cdot ($57) = $1,824 \]

  \[ P(X) \text{ of Av. change per Yr. in Democratization in the OECD,'75-04} \]
  is \[ 0.0017 = 0.00030(Y) + u, P(X) = $57 \text{ (per capita)} \]
Valuing Research Outcomes

• New Ideas Determined Endogenously
  By investment in bachelor’s and PhD Degrees
  Technical change endogenous, Not “from heaven”

• Creates “A Large Class of Educated People
  Spending All Day Every Day Creating, Exchanging,
  & Adapting New Ideas”
  Lucas (2008), Jones & Romer (2009)

• Measure New Idea Creation by Using Numbers of
  Masters and PhD’s?
  Then their impact on development indicators
  e.g. productivity in firms (Glasgow); rule of law, etc.
Methods of Valuing Non-Market Benefits

- Willingness to Pay/ Income-Equivalent (Haveman-Wolfe, 1984)


- Aggregate Effects, Single Growth Equation: Market Externalities Only

- Total Accounts (Kendrick, Eisner) and Well Being Estimates

Household Production Regression:

\[ Z = \alpha Y + \beta S + \ldots + u \]
Policies for Greater Economic Efficiency:

- **Market Failure:** Improve information to Families and to Legislators e.g., Research Gaps, Use Tracer Studies; 7
- **Overall Underinvestment by Families & Gov’ts**

**Results Of Underinvestment**

- **Real Earnings Flat, Rising Inequality**
- **Slow Development, State tax revenue limited**
- **Slow Regional Development**
- **Academic resources misallocated**
Measurement of Non-Market Outcomes

Income or Earnings:

\[ Y_t = \alpha_1 E_{t-20} + \alpha_2 Z_{i\ t-10} + \varepsilon_1 \]

Non-Market Private and Social Benefits (Recursive):

\[ Z_{i\ t} = \beta_1 E_{t-20} + \beta_2 Y_{t-20} + \beta_3 Z_{j\ t-20} + \varepsilon_{i2}, \quad i \neq j \]

Investment in Education:

\[ E_t = \gamma_1 E_{t-20} + \gamma_2 Y_{t-10} + \varepsilon_3 \]

- \( Y_t \) = Real per capita income or earnings,
- \( Z_{i\ t} \) = Non-Market Benefits, \~\text{~30 articles},
- \( E_{t-20} \) = Investment in Human Capital via Education.
- \( \varepsilon_1,.. \varepsilon_3 \) = Disturbances