A Framework for Understanding Economic Growth

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Short Run Macroeconomics

- Long Run Aggregate Supply
- Short Run Aggregate Supply
- Aggregate Demand
- Expected Price Level
- Natural Rate of Output
- Real Output
- Price Level
A Shortfall in Aggregate Demand

- Long Run Aggregate Supply
- Short Run Aggregate Supply
- Aggregate Demand
- Real Output
- Natural Rate of Output
- Price Level
- Expected Price Level
(a) Differences in output due to factor accumulation

Output per worker

Country 2
Country 1

Factors of production per worker

Production function in both countries

y_1

y_2

(b) Differences in output due to productivity

Output per worker

Country 2
Country 1

Factors of production per worker

Production function in Country 1

Production function in Country 2

Both countries

(c) Differences in output due to both productivity and factor accumulation

Output per worker

Country 2
Country 1

Factors of production per worker

Production function in Country 1

Production function in Country 2
## Average Years of Education

<table>
<thead>
<tr>
<th></th>
<th>1960</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing Countries</td>
<td>2.05</td>
<td>5.13</td>
</tr>
<tr>
<td>Advanced Countries</td>
<td>7.06</td>
<td>9.76</td>
</tr>
</tbody>
</table>
Output per Worker, $i = \text{Factors of Production per Worker, } i \times \text{Productivity}_i$

\[
\frac{\text{Output per Worker, } i}{\text{Output per Worker, } j} = \left( \frac{\text{Factors of Production per Worker, } i}{\text{Factors of Production per Worker, } j} \right) \times \left( \frac{\text{Productivity}_i}{\text{Productivity}_j} \right)
\]
Factors of production per worker relative to United States

Income group:
- Poorest 20%
- Second-poorest 20%
- Middle 20%
- Second-richest 20%
- Richest 20%

For sources, see Table 7.2.

Productivity relative to United States

Income group:
- Poorest 20%
- Second-poorest 20%
- Middle 20%
- Second-richest 20%
- Richest 20%

For sources, see Table 7.2.
Development Accounting for Mexico

Output per Worker 0.29

Physical Capital per Worker 0.27
Human Capital per Worker 0.79

Factors of Production per Worker 0.56

Productivity 0.52

Data for year 2000. All quantities relative to United States.
The Conceptual Framework

Factors of Production per Worker

Output per Worker

Productivity

Technology

Efficiency
Productivity\_i = Technology\_i \times Efficiency\_i

\frac{Productivity\_i}{Productivity\_j} = \left( \frac{Technology\_i}{Technology\_j} \right) \times \left( \frac{Efficiency\_i}{Efficiency\_j} \right)
Determinants of Efficiency (very partial list)

- Institutional Framework
- Trade Restrictions (legal or physical)
- Barriers to Mobility
- Monopolies
- Government Ownership of Firms
- Functioning of Financial System
20 Years of Growth Empirics on One Slide

SS Income = f(productivity, factor accumulation)

(+) (+)

Growth = f(SS Income, Current Income)

(+) (-)

Growth = f(Current Income, productivity, factor accumulation)

(-) (+) (+)