Some Notes on R&D, Structural Transformation and the Distribution of Income

Prof. Jeffrey D. Sachs

NBER Workshop on the Economics of Artificial Intelligence
September 14, 2017
<table>
<thead>
<tr>
<th>Category</th>
<th>Typical Expertise</th>
<th>Typical Workflow Predictability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods Producing</td>
<td>Low to Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Basic Business Services</td>
<td>Moderate</td>
<td>Moderate to High</td>
</tr>
<tr>
<td>Personal Services</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td>Professional Services</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Government</td>
<td>Moderate to High</td>
<td>Moderate to High</td>
</tr>
</tbody>
</table>
Figure 6. R&D and Intellectual Property (%GDP)

- R&D/GDP
- IPP/GDP
\[ Q = P^a N^b B^{(1-a-b)} \]
\[ P = L_P + t_P * M_P \]
\[ N = L_N + t_N * M_N \]
\[ L_U = L_{PU} \]
\[ L_I = L_{NI} + L_{PI} \]
\[ K = B + M_p \]
\[ W_U = a^* (L_U + t_P * M_P)^{(a-1)} L_I^b S^{(1-a-b)} \]
\[ W_I = b^* (L_U + t_P * M_P)^a L_I^{(b-1)} S^{(1-a-b)} \]
Figure 7. Labor by Educational Attainment
Figure 8. Labor By Educational Attainment
Automation for Low-Skilled and Intermediate-Skill Tasks
Figure 9. Labor Share of GDP